Housing Shock and Online Consumer Behavior

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Motivation: Housing Wealth and Consumer Behavior

- Housing wealth accounts for a large share of household wealth
  - Rising housing prices worldwide, particulalry in China Global Price
  - home-ownership rates around the globe Home-ownership
    - ★ home-ownership in China: around 90%
  - how housing wealth affects consumption is an important question: *(Campbell and Cocco, 2007; Gan, 2010; Aladangady, 2017; Agarwal and Qian, 2017; Waxman et al., 2019)*
- Consumer Behaviors
  - offline consumption
    - ★ 17.422 trillion U.S. dollars worldwide in 2020
  - **online consumption and consumer behavior**
    - ★ 4.2 trillion U.S. dollars worldwide in 2020
    - ★ China now has the world's largest e-commerce market
- In this paper we examine the causal impact of housing wealth on online consumer behavior

Empirical Challenges

- Endogeneity: omitted variables jointly drive consumption and housing prices
  - lottery gambling *(Imbens et al., 2001; Kuhn et al., 2011)*
  - weather shocks *(Wolpin, 1982; Paxson, 1993)*
  - unanticipated government policies *(Parker et al., 2013; Agarwal and Qian, 2014; Jappelli and Pistaferri, 2014; Haushofer and Shapiro, 2016)*
  - exogenous shock to the house price: collapse of housing market, announcement of land king *(Mian et al., 2013; Gu et al., 2019)*
- Mechanisms:
  - wealth effect
  - collateral effect
  - rent effect (less discussed)
  - income effect

Empirical Challenges

- Lack of Micro-level Online Consumption Data
  - very few papers investigate online consumption
    - ★ Alibaba e-commerce data *(Luo et al., 2019; Couture et al., 2020)*
    - ★ eBay transaction data *(Hortaccsu et al., 2009; Einav et al., 2014)*
  - online transaction data provides information that is sometimes impossible to observe in offline consumption data.
    - ★ e.g., order creation time, order payment time, product return status, detailed delivery address, etc.

In This Paper, We....

- use arguably exogenous and unexpected housing wealth shocks
  - announcement of a state-level special economic development zone, Xiong'an New Area
  - suspension of real estate transactions in the Xiong'an New Area
- Use Online Transaction Data
  - a comprehensive dataset provided by the largest e-commerce company in China
- ... to examine the causal effects of housing wealth on online consumer behavior.

Specific Research Questions

1. What are the impacts of housing price shock on various measures of online consumer behaviors?
2. What are the underlying mechanisms?
3. Are the impacts persistent?
4. Are the impacts heterogeneous across various types of consumers and product categories?

Background: Xiong'an New Area

- 19th state-level New Area: first announced by both the Central Committee of the CCP and the State Council on April 1, 2017
- Located in the center of Hebei province, around 100 km southwest of Beijing and 50 km from downtown Baoding
- Will serve as a development hub for the Beijing-Tianjin-Hebei economic triangle, and provide non-capital functions for Beijing (e.g. schools, hospitals, headquarters of SOEs, public services, and financial institutions)
- Massive investment and funding for infrastructure ($588 billion)
- Spans three counties of Xiong, Rongcheng, Anxin Map

Background: the announcement of the Xiong'an New Area

Announcement creates a genuinely unexpected, exogenous, and sizeable housing price shock

- **exogenous**
  - central government suddenly announced the news on April 1, 2017
- **unexpected** Heatmap
  - the announcement date and the geographic coverage of the New Area were kept in the strictest confidence
  - all members of the planning committee signed the confidential agreement
  - President Xi Jinping's visit to Anxin County on February 23, 2017 was revealed to the public after the announcement
  - land transactions in the Xiong'an New Area remained low in the pre-announcement period Land Market
- **sizable**
  - Xiong'an experienced an unprecedented boom in housing prices on the day of the announcement Housing Market
  - Government suspended all real estate transactions on Apr 2, 2017

Related Literature

1. Behavioral response to changes in wealth or income
   - consumption responses to unexpected income changes
     - ★ lottery gambling *(Imbens et al., 2001; Kuhn et al., 2011)*,
     - ★ disability *(Gertler and Gruber, 2002; Meyer and Mok, 2019)*,
     - ★ weather shocks *(Wolpin, 1982; Paxson, 1993)*,
     - ★ unanticipated government policies *(Parker et al., 2013; Agarwal and Qian, 2014; Jappelli and Pistaferri, 2014; Haushofer and Shapiro, 2016)*
   - impact of income shocks on labor supply *(Haushofer and Shapiro, 2016; Blattman et al., 2017; Cesarini et al.,2017; Li et al., 2020)*,

Related Literature

2. Cconsumption responses to changes in housing wealth
   - positive responses *(Campbell and Cocco,2007; Mian et al., 2013; Aladangady, 2017)*
   - negative responses *(Waxman et al., 2019)*
   - more consumption activities at work hours *(Gu et al., 2019)*.

3. Growing literature on online consumption
   - positive correlation between e-commerce development and consumption growth *(Luo et al., 2019)*
   - little evidence of consumption response to an e-commerce expansion program in China *(Couture et al., 2020)*
   - e-commerce reduces the trade barrier observed in offline trade *(Hortacsu et al., 2009)*
   - the sensitivity of e-commerce purchasing to sales taxes *(Einav et al., 2014)*

Data: Source

- Online consumption data
  - Randomly selected 0.1% (4,441) of active sellers from October 1, 2016 to December 31, 2018 from China's largest e-commerce company
  - Universe of transactions of selected sellers during the period
  - We restrict to a sample of local residents: buyers whose delivery addresses are located only in the same area both before and after the announcement
  - Rich information including transaction amount, discount amount, product name, order creation time, payment time, return status, delivery fee, delivery company, and delivery address; consumers' age and gender
  - Data strength: representativeness, high resolution, sufficiently long sample period
- Supplemental data
  - average housing listing price and rental price per month in each county
  - per capita GDP growth rate at the county level

Data: Measures of Consumer Behavior

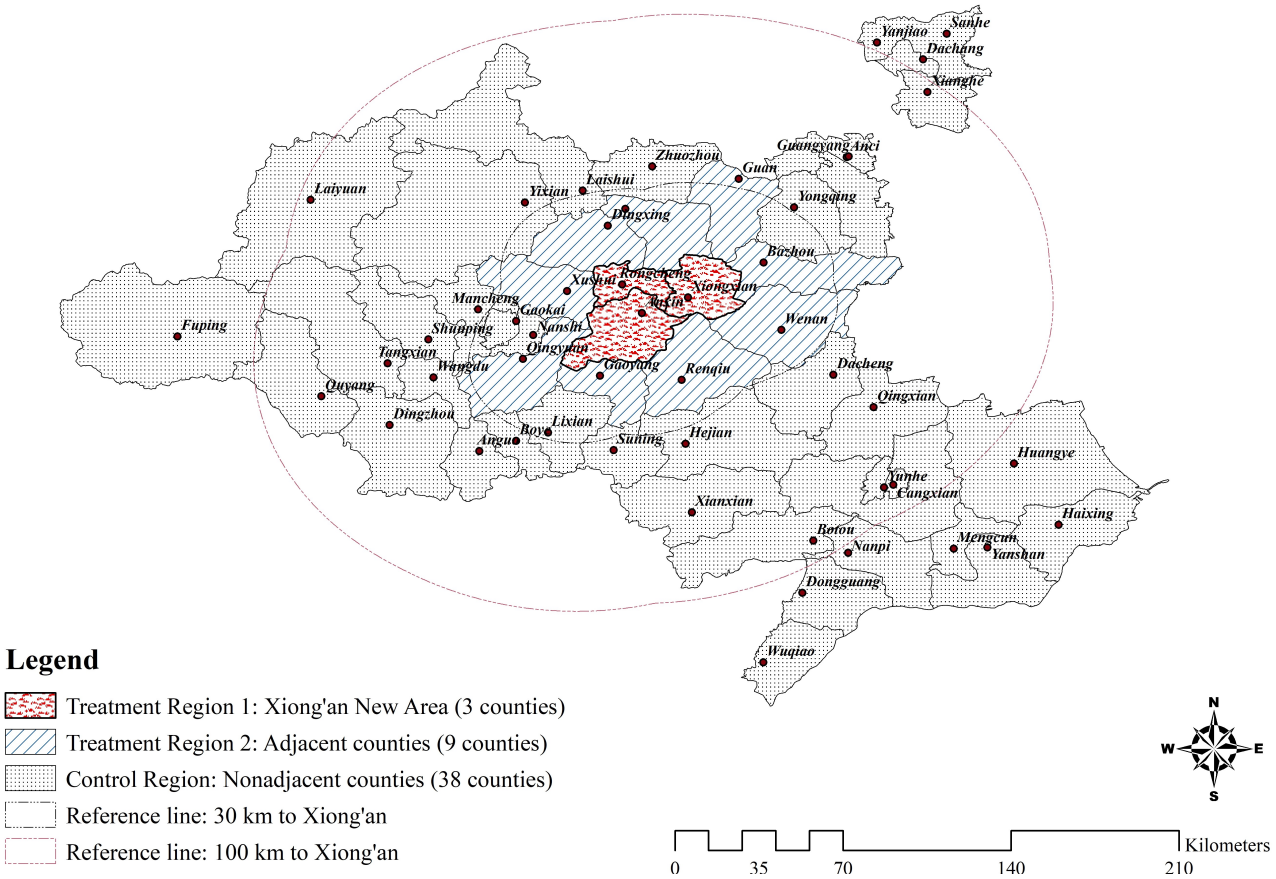
- Measures that reflect buyers' consumption level:
  - **payment per order**
  - **number of items per order**
  - **payment per item**
  - **discount fees per item**

- Measures that reflect buyers' "perceived risk" or "uncertainty" *(Corbin, 1980; Cho et al.,2006)*:
  - **payment hesitation**: a continuous variable that measures the time difference between order creation time and order payment time
  - **return propensity**: a dummy variable equal to 1 if an order has been returned to a seller and a refund requested, and 0 otherwise

- Measures that reflect buyers' labor supply (*Gu et al., 2019*):
  - **shirking propensity**: a dummy variable equal to 1 if an order is created during the work hours, and 0 otherwise

Research Design

- **Sample Period:** Oct 1, 2016 to Dec 31, 2018
- **Event:** Public announcement of Xiong'an New Area on April 1, 2017
- **Treatment region 1:** the Xiong'an New Area (3 counties)
- **Treatment region 2:** adjacent counties (9 counties)
- **Control region:** non-adjacent counties (38 counties)



Methodology: Underlying Mechanisms

- Ways to realize the housing wealth after the Xiong'an announcement
  - C3 (Treatment 1)-a frozen housing market
    - ★ collateral effects: access to home equity loans
    - ★ rent effects: increased rental income
  - C9 (Treatment 2)
    - ★ collateral effects: access to home equity loans
    - ★ rent effects: increased rental income
    - ★ wealth effects: sell properties
- A two-step approach to disentangle different effects
  1. Full Sample Comparison: the homeownership status is unknown
     - ★ C3 (Treat 1) vs. C38 (Control): collateral +rent effects
     - ★ C9 (Treat 2) vs. C38 (Control): collateral +rent +wealth effects
  2. Subsample Comparisons: extremely high homeonership rate (99.25%) at the village level Ownership Rate 1 Ownership Rate 2
     - ★ C3 (buyers in 10 villages only) vs. C38 (Control): collateral effects
     - ★ C9 (buyers in 39 villages only) vs. C38 (Control): collateral +wealth effects

Summary Statistics

- Groups 1, 2, and 3 respectively consist of buyers whose delivery addresses are located ONLY within the 3 Xiong'an counties, 9 adjacent counties, and 38 non-adjacent counties, both before and after the Xiong'an announcement.
  - Group 1: 10,738 buyers (in Treatment Region 1)
  - Group 2: 60,719 buyers (in Treatment Region 2)
  - Group 3: 187,629 buyers (in Control Region)

	Group 1: 3 Xiong'an Counties (C3)				Group 2: 9 Adjacent Counties (C9)				Group 3: 38 non-Adjacent Counties (C38)			
	Before		After		Before		After		Before		After	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Panel A: Item Level Statistics												
Item Price	126.07	213.74	136.95	242.18	128.6	220.18	138.49	253.79	132.45	724.15	139.46	278.48
Item Payment	52.79	94.67	65.35	95.26	54.2	89.13	64.57	105.74	54.61	102.56	62.89	118.42
Item Return	0.27	0.44	0.14	0.35	0.25	0.44	0.23	0.42	0.25	0.43	0.25	0.43
Discount Fee	73.28	142.63	71.6	194.95	74.4	159.94	73.92	194.94	77.84	689.02	76.57	211.26
Observations	92,373				507,042				1,422,904			
Panel B: Order Level Statistics												
# of Items	1.43	3.18	1.6	2.46	1.59	7.13	1.56	6.03	1.5	4.17	1.57	12.35
Order Payment	61.05	110.61	75.11	108.08	65.92	124.79	77.11	117.28	62.64	126.62	70.36	118.58
Hesitation	359.7	1,990.00	222.09	1,483.62	194.63	1,476.86	176.04	1,393.53	177.96	1,403.44	158.98	1,332.90
Shirking	0.33	0.47	0.4	0.49	0.34	0.47	0.36	0.48	0.35	0.48	0.33	0.47
Observations	52,605				289,886				836,725			

Response of Housing Market

- Examine the impact of Xiong'an announcement on the housing listing price and rental price:

$$Y_{j,m} = \alpha + \lambda \cdot Treat_j \cdot After_m + \theta_j + \gamma_m + \epsilon_{j,m} \quad (1)$$

  - the dependent variable $Y_{j,m}$ takes two forms: log of listing price (CNY/sq^2) and log of rental price (CNY/sq^2) for county j in year-month m
  - $Treat_j$ is a dummy variable equal to 1 for the treatment counties, and 0 for the control counties.
  - $After_m$ is a dummy variable equals 1 for the periods after April, 2017, and 0 otherwise.
  - θ_j and γ_m refer to the county fixed effects and year-month fixed effects
  - the standard errors are clustered at the county level

Results: Response of Housing Market

Model	Panel A: C3 vs. C38		Panel B: C9 vs. C38	
Dep. Variable	ln(Listing Price)	ln(Rental Price)	ln(Listing Price)	ln(Rental Price)
Model	(1)	(2)	(3)	(4)
Treat*After	0.484***	0.586***	0.146*	0.276***
	(0.082)	(0.142)	(0.077)	(0.023)
Observations	1,107	1,107	1,269	1,269
R-squared	0.927	0.811	0.922	0.841
County FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes

- Residents in both the Xiong'an New Area and the adjacent counties experienced the unexpected housing market shock
  - The transaction price and rental price in C3 increase by 62.26% *(= exp(0.484)-1)* and 79.68% *(= exp(0.586)-1)*, respectively, more than those in C38 in the post-announcement period.
  - The transaction price and rental price in C9 increase by 15.72% *(= exp(0.146)-1)* and 31.78% *(= exp(0.276)-1)*, respectively, more than those in C38 in the post-announcement period.

Response of Online Consumer Behaviors

- The difference-in-differences approach:

$$Y_{o,b,s,d} = \alpha + \beta \cdot Treat_b \cdot After_d + \Delta GDP_{j,y} + \delta_s + \theta_b + \gamma_d + \epsilon_{o,b,s,d} \quad (2)$$

  - o, b, s, and d respectively index the order/item, buyer, seller and date
  - $Y_{o,b,s,d}$ takes different forms at the order or item level that are categorized into three sets
    - ★ payment per order, number of items per order, payment per item, discount fees per item
    - ★ payment hesitation, return propensity
    - ★ shirking propensity
  - $Treat_b$ is a dummy variable equal to 1 for the treated buyers
  - $After_d$ is a dummy variable equals 1 for the periods after April 1, 2017
  - $\Delta GDP_{j,y}$ is the growth of GDP for county j in year y: **Income Effect**
  - θ_b, δ_s, and γ_d refer to the buyer and seller fixed effects, and the date fixed effects
  - the standard errors are clustered at the seller level

Elasticities of Consumer Behavior with Respect to Housing Price

- Response of Housing Price:
  $Y_{j,m} = \alpha + \lambda \cdot Treat_j \cdot After_m + \theta_j + \gamma_m + \epsilon_{j,m}$
- Response of Consumer Behaviors:
  $Y_{o,b,s,d} = \alpha + \beta \cdot Treat_b \cdot After_d + \Delta GDP_{j,y} + \delta_s + \theta_b + \gamma_d + \epsilon_{o,b,s,d}$
- $\frac{\beta}{\lambda}$ is the elasticity of consumer behaviors with respect to housing price

Dynamic Response of Consumer Behavior

- We study the dynamics of the behavioral responses by estimating:

$$Y_{o,b,s,d} = \alpha + \sum_{s=-5}^{19} \beta_s \cdot Treat_b \cdot 1\{d \in Month_s\} + \Delta GDP_{j,y} + \delta_s + \theta_b + \gamma_d + \epsilon_{o,b,s,d} \tag{3}$$

- $d \in Month_s$ is a binary indicator taking value 1 if transaction date d is in month $s \in \{-5, -4, ..., 0, 1, ..., 19\}$.
- β_s captures the difference in the response of consumer behavior measures compared with the benchmark month (October 2016) between the buyers in treatment and control counties
- β_{-5}, ... , β_{-1} measure the different trends of consumption behavior response between the treatment and control buyers in each of the five pre-announcement months; and these coefficients examine whether **the parallel trend assumption** for DID is satisfied.

Results: Response of Consumer Behavior-Full Sample

Model	(1) C3 vs. C38				(2) C9 vs. C38			
Panel A. consumption								
Dep. Variable	$payment_o$	$quantity_o$	$payment_i$	$discount_i$	$payment_o$	$quantity_o$	$payment_i$	$discount_i$
Treat*After	0.110***	0.015	0.097***	-0.013	0.042***	0.002	0.047***	-0.002
	(0.022)	(0.016)	(0.017)	(0.022)	(0.006)	(0.003)	(0.003)	(0.007)
ΔPerGDP	0.017	0.005	0.004	0.139***	0.062*	0.022	-0.009	0.141***
	(0.037)	(0.016)	(0.032)	(0.048)	(0.036)	(0.017)	(0.033)	(0.053)
Observations	889,330	889,330	1,515,277	1,515,277	1,126,611	1,126,611	1,929,946	1,929,946
R-squared	0.781	0.544	0.837	0.821	0.778	0.543	0.835	0.821
Panel B. perceived risk or uncertainty								
Dep. Variable	$hesitation_o$		$return_i$		$hesitation_o$		$return_i$	
Treat*After	-0.153***		-0.085***		-0.062***		-0.031***	
	(0.016)		(0.005)		(0.007)		(0.002)	
ln(Payment)	0.122***		0.045***		0.123***		0.044***	
	(0.004)		(0.003)		(0.005)		(0.003)	
ΔPerGDP	0.127*		0.074***		0.132**		0.050***	
	(0.068)		(0.003)		(0.064)		(0.003)	
Observations	889,330		1,515,277		1,126,611		1,929,946	
R-squared	0.511		0.469		0.504		0.463	
Panel C. labor supply								
Dep. Variable	$shirking_o$				$shirking_o$			
Treat*After	0.083***				0.034***			
	(0.005)				(0.002)			
ΔPerGDP	-0.097***				-0.003			
	(0.023)				(0.022)			
Observations	889,330				1,126,611			
R-squared	0.543				0.54			
Buyer FE	Yes				Yes			
Seller FE	Yes				Yes			
Daily FE	Yes				Yes			

Results: Response of Consumer Behavior-Sub Sample

Model	(1) C3 vs. C38				(2) C9 vs. C38			
Panel A. consumption								
Dep. Variable	$payment_o$	$quantity_o$	$payment_i$	$discount_i$	$payment_o$	$quantity_o$	$payment_i$	$discount_i$
Treat*After	0.095***	0.011	0.083***	-0.010	0.039***	0.001	0.045***	-0.002
	(0.025)	(0.014)	(0.017)	(0.024)	(0.004)	(0.002)	(0.003)	(0.005)
ΔPerGDP	0.009	-0.005	0.110**	0.088***	0.048	0.011	0.108*	0.084***
	(0.042)	(0.019)	(0.050)	(0.024)	(0.042)	(0.017)	(0.055)	(0.021)
Observations	678,333	678,333	1,202,905	1,202,905	862,034	862,034	1,534,600	1,534,600
R-squared	0.760	0.556	0.812	0.865	0.754	0.578	0.812	0.806
Panel B. perceived risk or uncertainty								
Dep. Variable	$hesitation_o$		$return_i$		$hesitation_o$		$return_i$	
Treat*After	-0.115***		-0.071***		-0.048***		-0.025***	
	(0.018)		(0.005)		(0.008)		(0.002)	
ln(Payment)	0.122***		0.046***		0.123***		0.045***	
	(0.005)		(0.003)		(0.005)		(0.003)	
ΔPerGDP	0.210***		0.088***		0.186**		0.084***	
	(0.075)		(0.024)		(0.068)		(0.023)	
Observations	678,333		1,202,905		862,034		1,534,600	
R-squared	0.531		0.509		0.524		0.441	
Panel C. labor supply								
Dep. Variable	$shirking_o$				$shirking_o$			
Treat*After	0.069***				0.026***			
	(0.004)				(0.003)			
ΔPerGDP	-0.075***				-0.002			
	(0.025)				(0.012)			
Observations	678,333				862,034			
R-squared	0.553				0.535			
Buyer FE	Yes				Yes			
Seller FE	Yes				Yes			
Date FE	Yes				Yes			

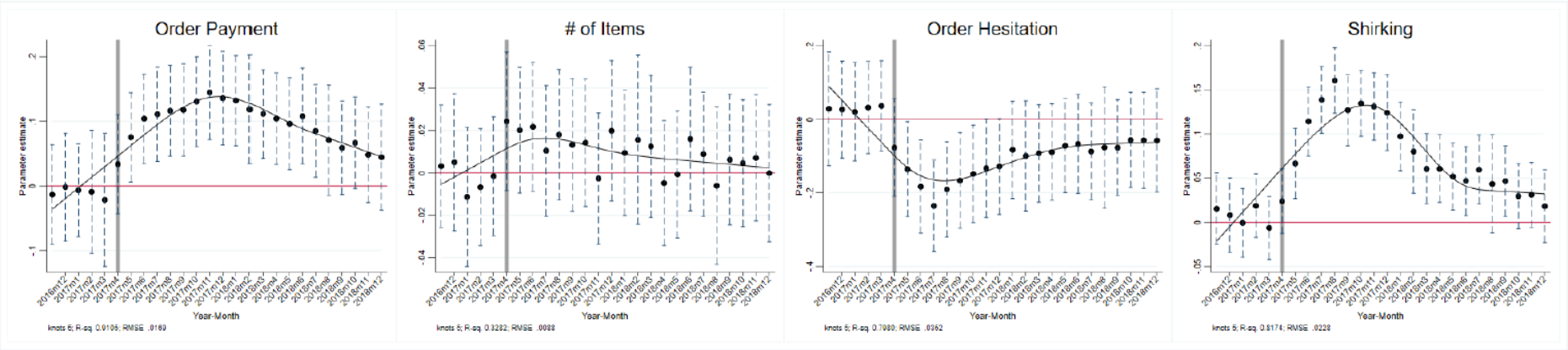
Results: Elasticities

Model	(1)	(2)	(3)	(4)	(5)
	Table 3 C3 vs. C38	Table 3 C9 vs. C38	Table 4 C3 vs. C38	(2)-(1)	(1)-(3)
Effects	Collateral+Rent	Collateral+Rent +Wealth	Collateral	Wealth	Rent
Order payment	0.227	0.288	0.196	0.061	0.031
Number of items per order	0.031	0.014	0.023	-0.017	0.008
Payment per item	0.200	0.322	0.171	0.122	0.029
Discount fees	-0.027	-0.014	-0.021	0.013	-0.006
Payment hesitation	-0.316	-0.425	-0.238	-0.109	-0.078
Return intention	-0.176	-0.212	-0.147	-0.036	-0.029
Shirking propensity	0.172	0.233	0.143	0.061	0.029

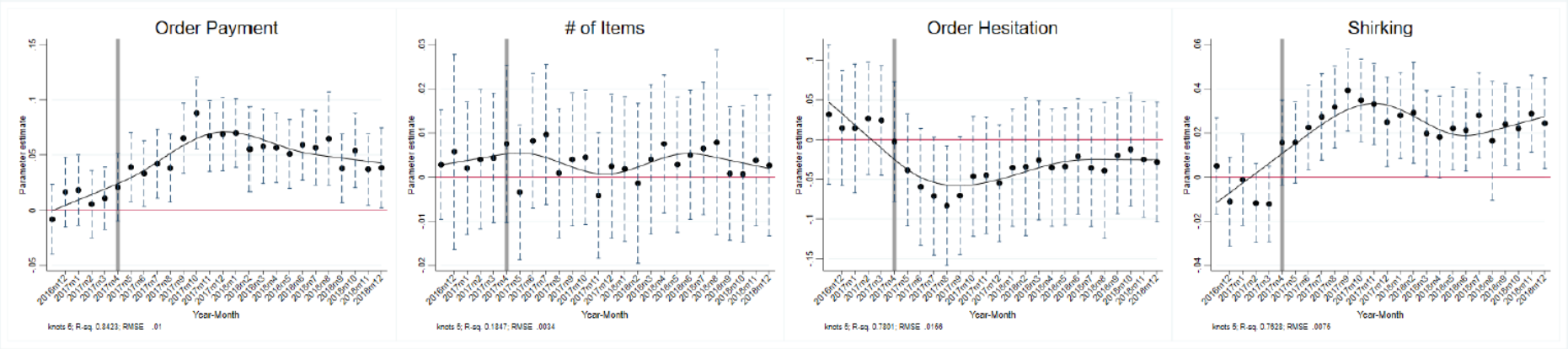
- Elasticities are greater in magnitude in C9 than those in C3 in almost all behavioral measures
- Collateral effects on consumer behavior are greater in magnitude than the wealth effects
- The magnitude of rent effects is smaller than the other two effects, which could be explained by the high homeownership rates in C3 and C9

Results: Dynamic Response of Consumer Behavior at Order Level

Panel A: C3 vs C38

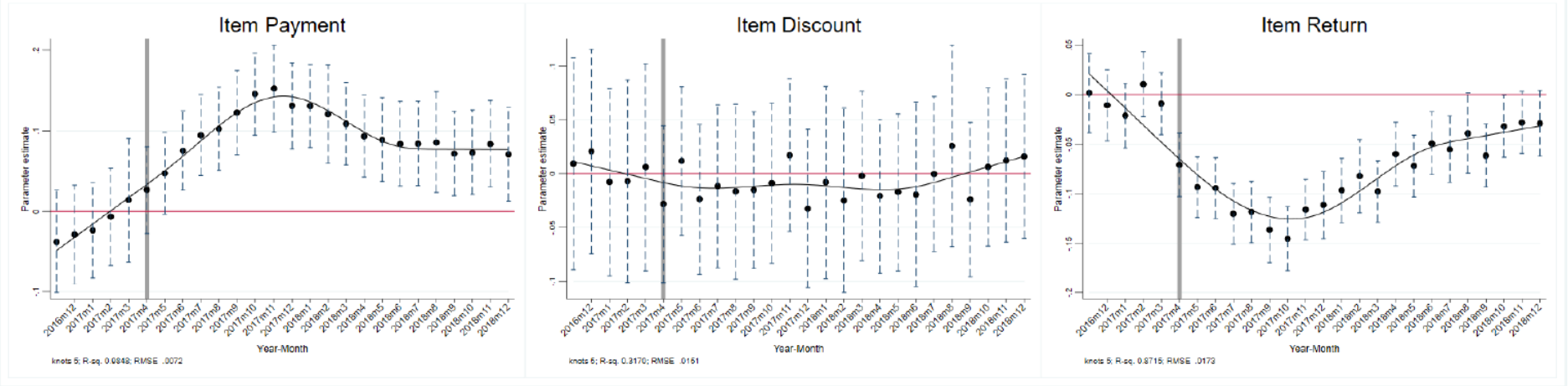


Panel B: C9 vs C38

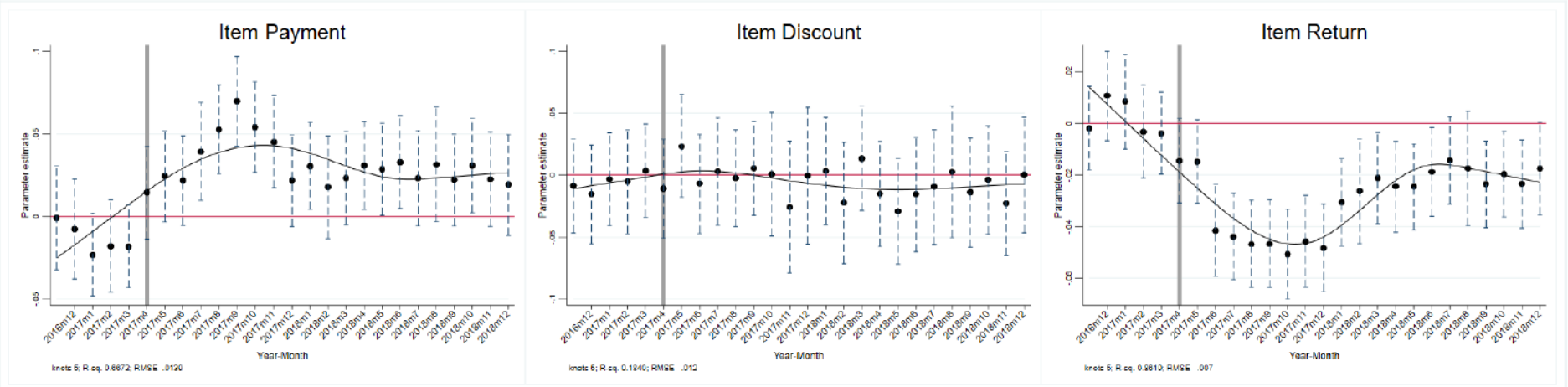


Results: Dynamic Response of Consumer Behavior at Item Level

Panel A: C3 vs C38



Panel B: C9 vs C38



Results: Additional Tests

- Heterogeneity Tests
  - across buyer's gender and age (<=30, 30-50, and >=50)
    - ★ order-level Heterogeneity 1
    - ★ item-level Heterogeneity 2
  - across item's categories Heterogeneity 3

- Robustness Tests
  - control for buyer-quarter fixed effects Buyer-Quarter
  - 3km border regressions Border Regression
  - Buyer-YearMonth Level Analysis Buyer-YearMonth
  - consumption upgrade across sellers Upgrade

Conclusions

- The Xiong'an announcement leads to substantial increases in the housing listing prices and rental prices in both C3 and C9
- The positive housing wealth shocks lead to consumption upgrade within the sellers
- The positive housing wealth shocks reduce consumption hesitation as well as the probability of return, and increase the shirking propensity
- The collateral effects are greater than the wealth effects; and they jointly contribute the most to the elasticities of consumer behavior with respect to housing price

Thank you

Q&A

Global Housing Prices

SOURCE: Bank for International Settlements, European Central Bank, Federal Reserve Bank of Dallas, Savills, and national sources

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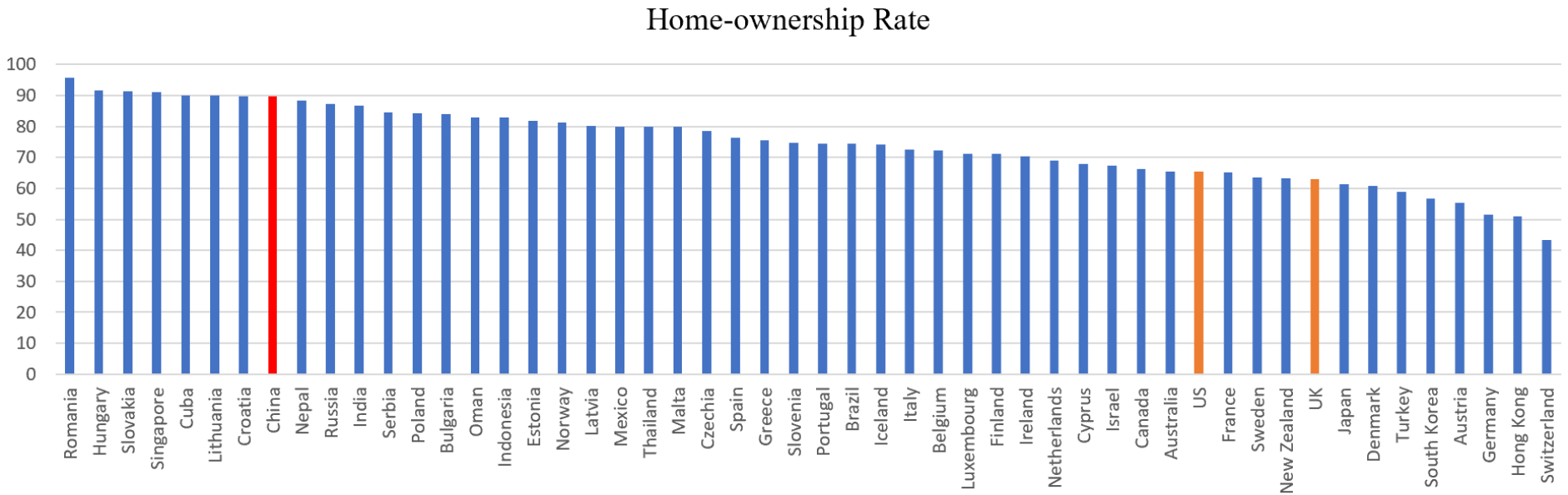
Home-ownership Rates



Source: IMF

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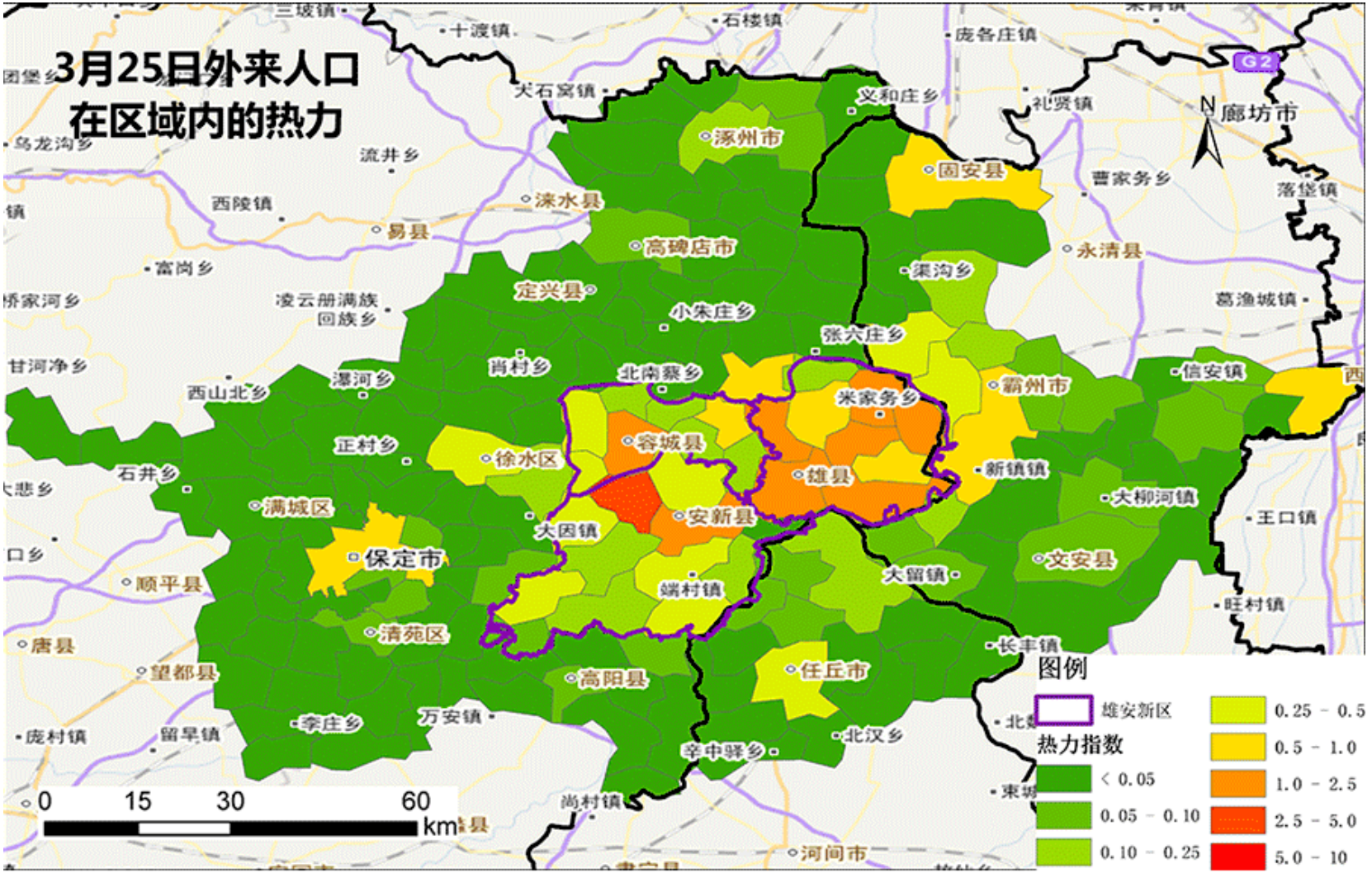
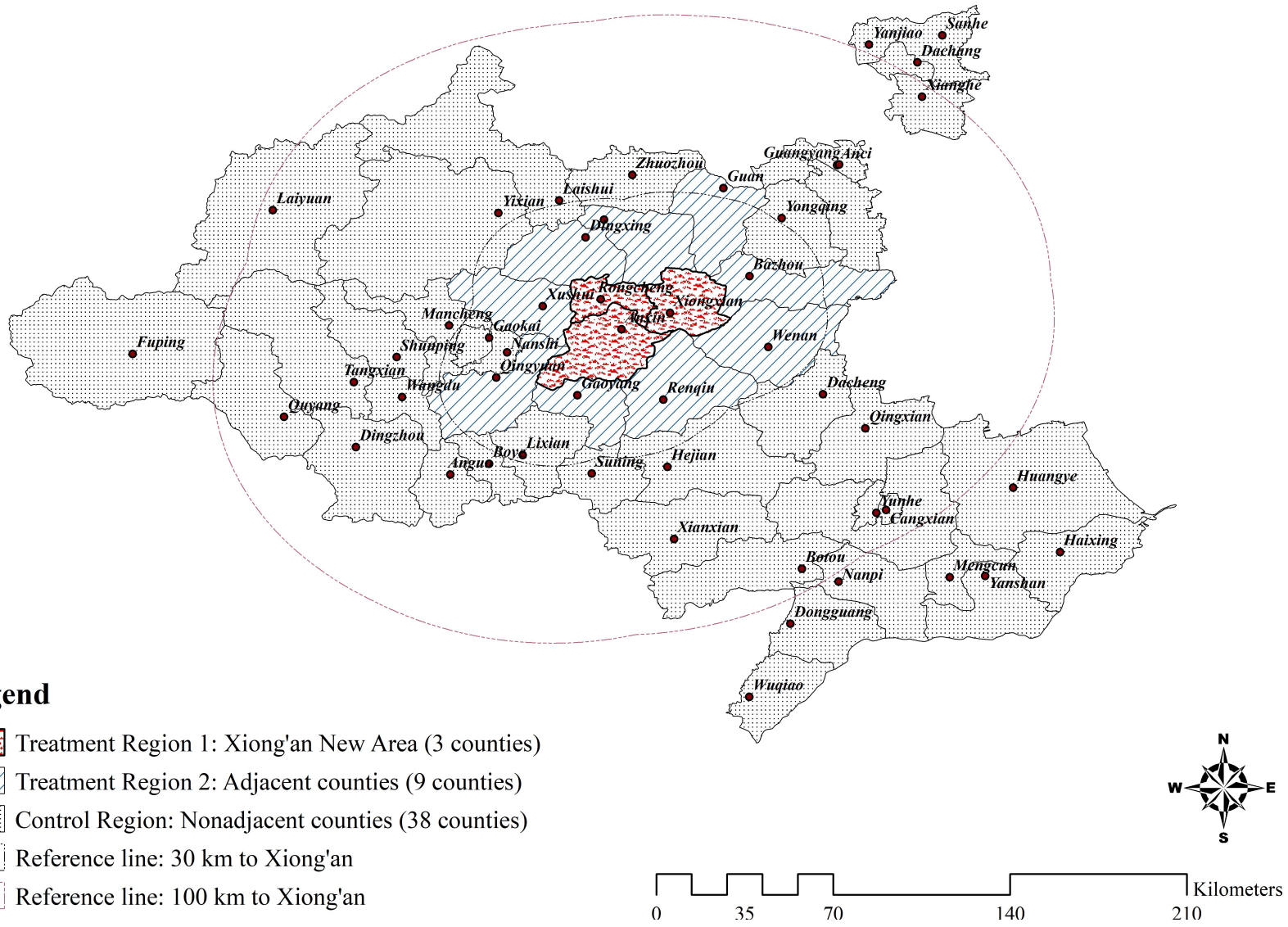
A Heatmap of Non-local Population Movement



Geographic Distribution of Sample Counties



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Housing Market

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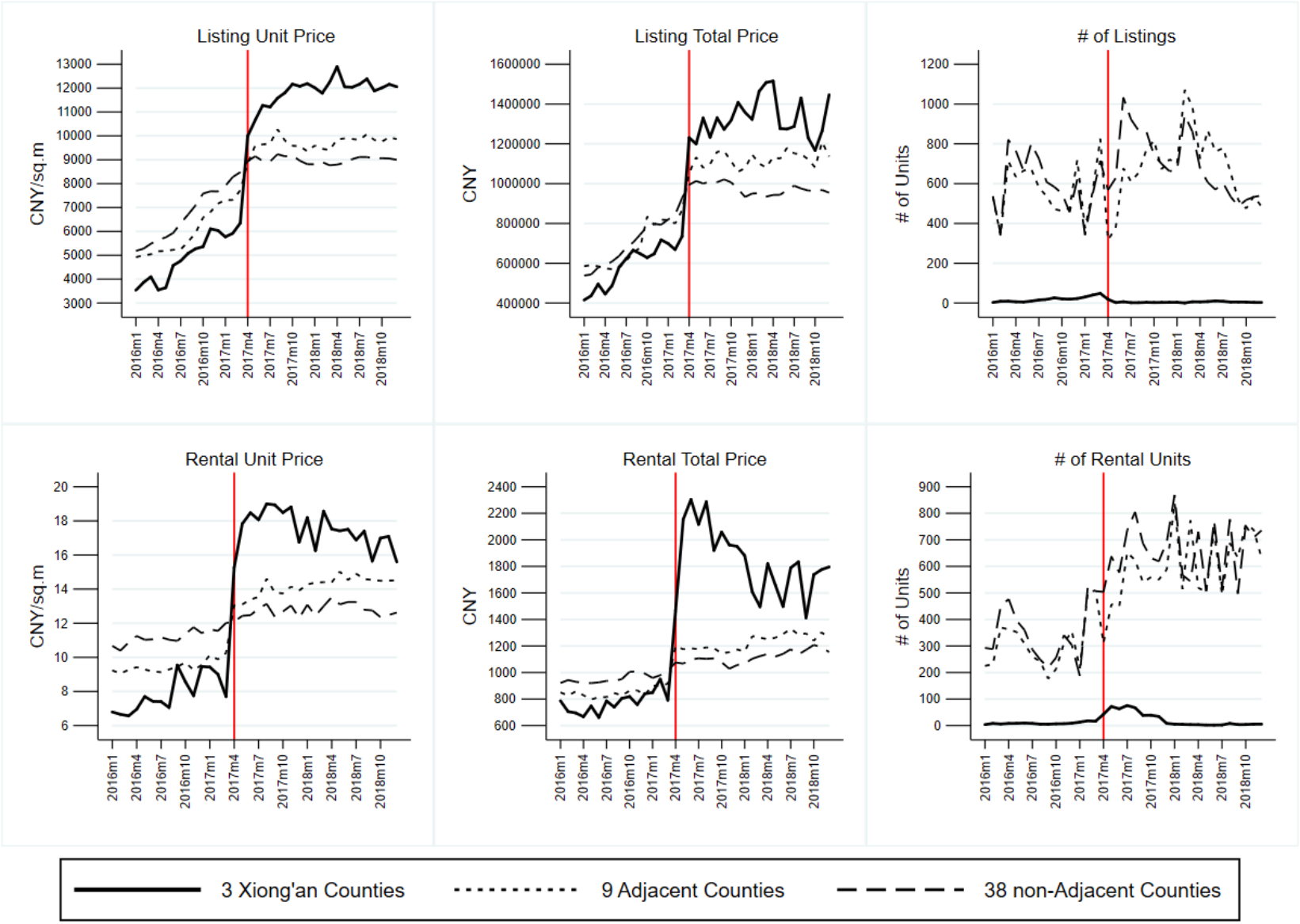

Land Market

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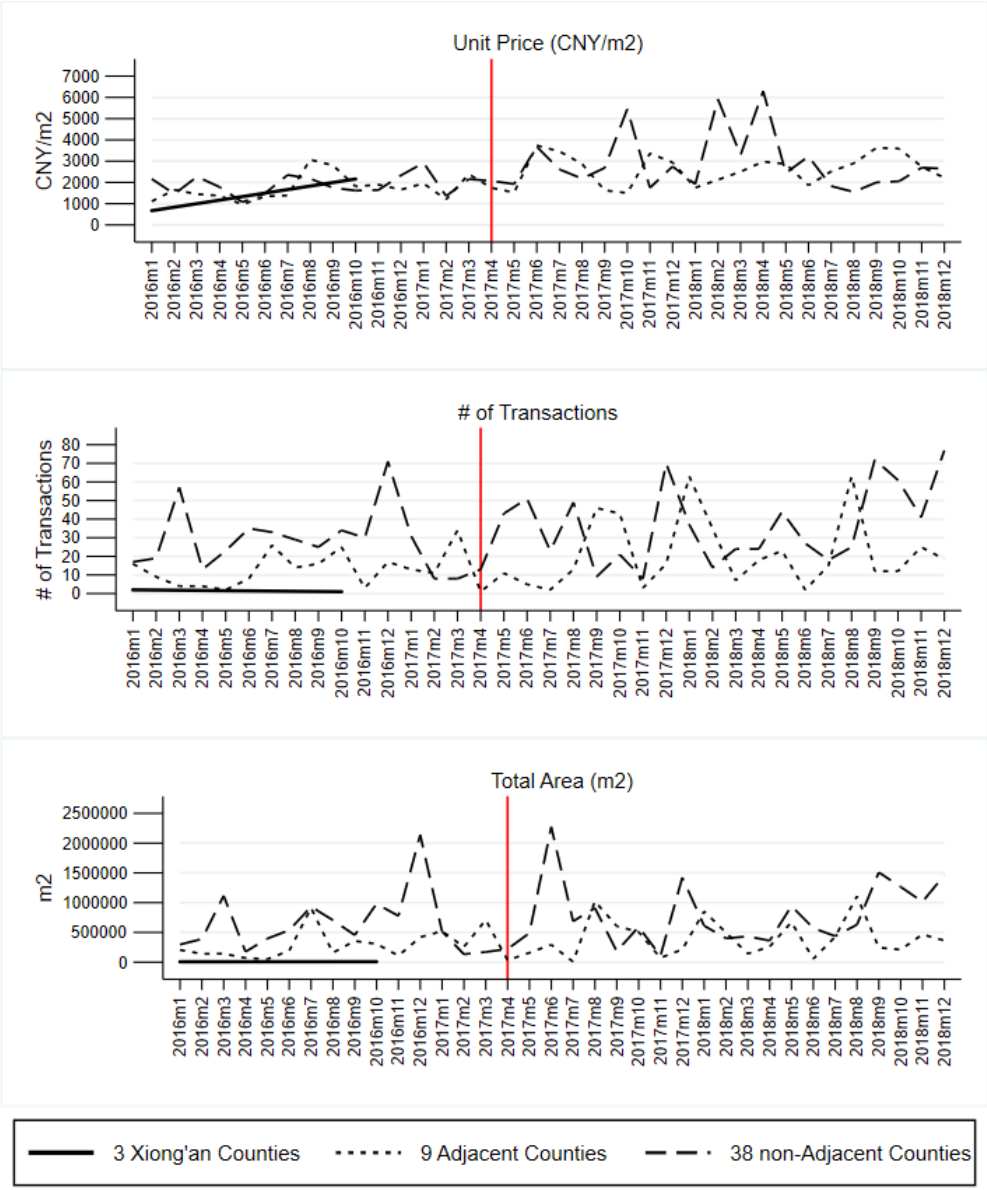

Home-ownership Rates in China

		Rent		Own							
Region	Total	Affordable Rental Housing	Regular Rental Housing	Self-built Housing	CommerciaResidential Housing (First-hand)	Commercia Residential Housing (Second-hand)	Affordable Housing	Public Housing	Others	Average Rental Rate = (Affordable Rental Housing + Regular Rental Housing)/ Total	Average Homeownership Rate
Total											
China	39270972	569511	4121744	24469158	4454150	1071625	856922	2682950	1044912	11.95%	88.05%
Hebei	2035826	13205	68398	1542698	194776	33767	34720	124373	23889	**4.01%**	**95.99%**
City level											
China	12416562	329846	2869199	2039582	3231278	618097	627345	2147896	553319	25.76%	74.24%
Hebei	423928	5239	40427	90023	121059	19070	26352	107265	14493	**10.77%**	**89.23%**
Town level											
China	7554783	158780	845218	4244922	1112202	307562	185238	436025	264836	13.29%	86.71%
Hebei	466266	5568	21817	329159	70275	11250	7487	15193	5517	**5.87%**	**94.13%**
Village level											
China	19299627	80885	407327	18184654	110670	145966	44339	99029	226757	2.53%	97.47%
Hebei	1145632	2398	6154	1123516	3442	3447	881	1915	3879	**0.75%**	**99.25%**

Source: Section 9.4 of the Sixth National Population Census of China Database
http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm

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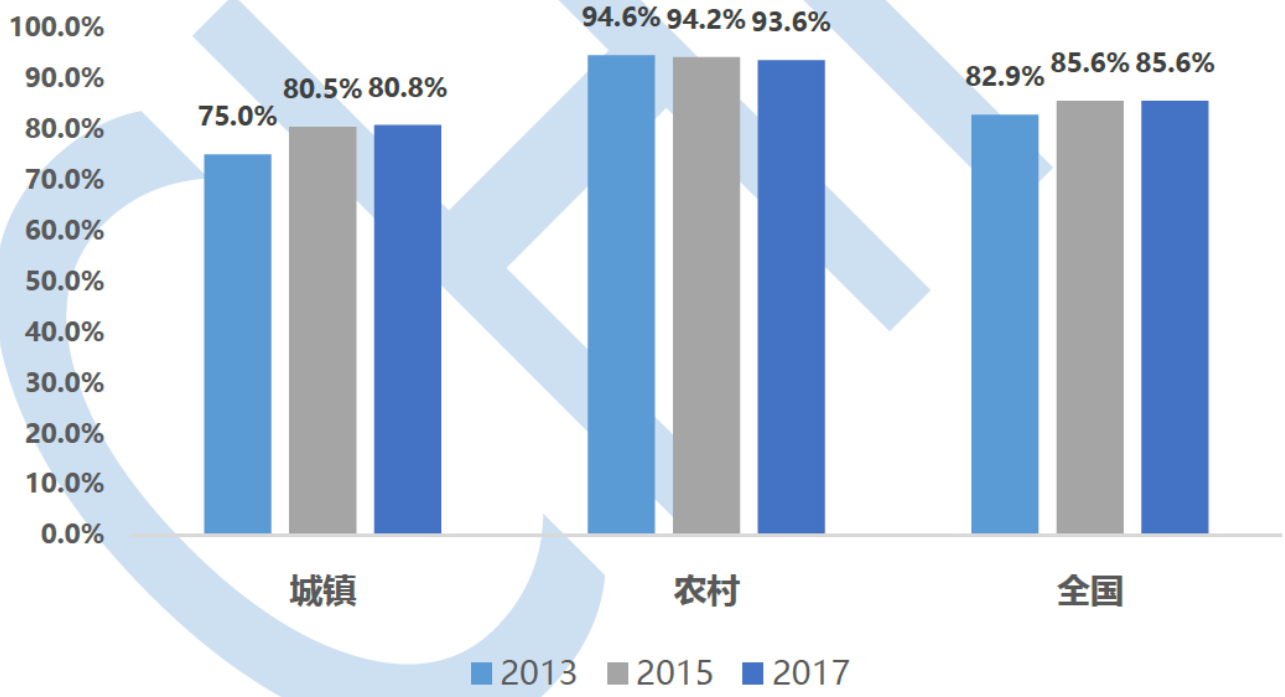
Home-ownership Rates in China

根据 2017 年中国家庭金融调查的数据，我国家庭的住房自有率同样较高，全国家庭住房自有率为 85.6%，城镇家庭住房自有率为 80.8%，农村家庭住房自有率为 93.6%。相较于 2013 年，中国家庭住房自有率有所上升，但相较于 2015 基本保持不变。



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Results: Heterogeneity Analysis at Order Level

Panel A: C3 v.s C38

Panel B: C9 v.s C38

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Results: Heterogeneity Analysis at Item Level

Panel A: C3 v.s C38

Panel B: C9 v.s C38

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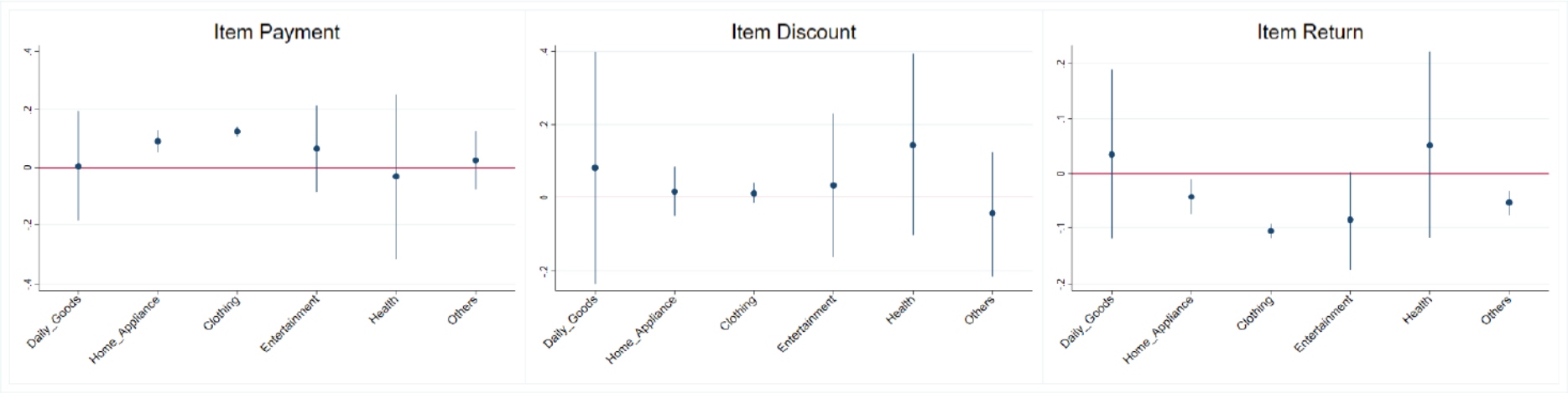
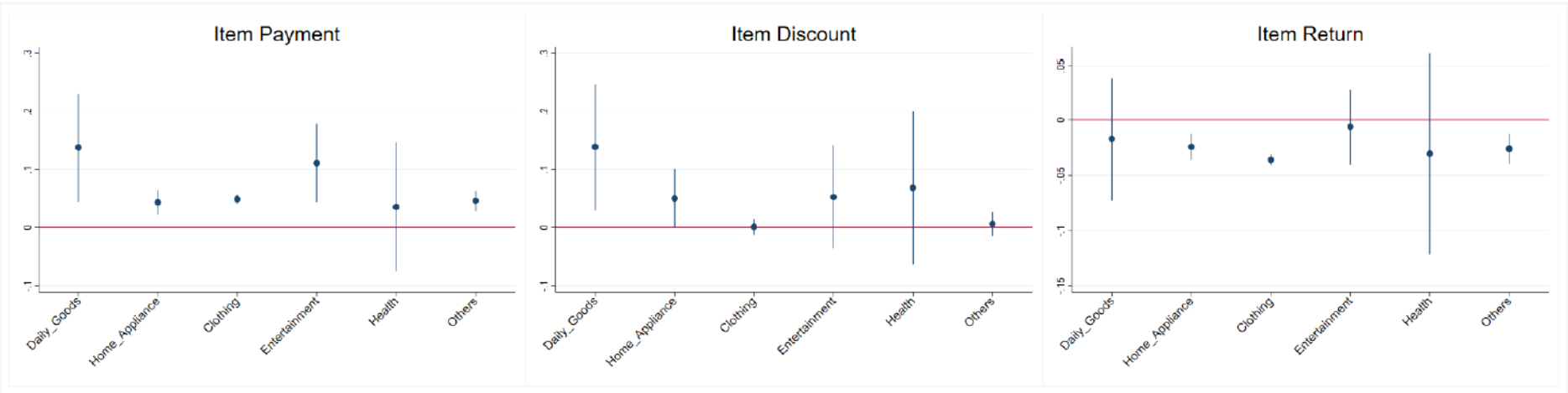
Results: Heterogeneity Analysis at Item Level

- Six sub-groups: daily goods, home appliances, clothing, entertainment, health, and others

Panel A: C3 vs C38



Panel B: C9 vs C38



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Results: Control for Buyer-Quarter Fixed Effects

Model	(1) C3 vs. C38				(2) C9 vs. C38			
Panel A. consumption								
Dep. Variable	$payment_o$	$quantity_o$	$payment_i$	$discount_i$	$payment_o$	$quantity_o$	$payment_i$	$discount_i$
Treat*After	0.118***	0.013	0.126***	-0.011	0.056***	0.002	0.043***	0.003
	(0.022)	(0.016)	(0.017)	(0.022)	(0.006)	(0.003)	(0.003)	(0.007)
ΔPerGDP	-0.020	0.005	-0.031	0.117*	0.022	0.022	-0.014	0.173***
	(0.037)	(0.016)	(0.039)	(0.061)	(0.036)	(0.017)	(0.033)	(0.053)
Observations	889,330	889,330	1,515,277	1,515,277	1,126,611	1,126,611	1,929,946	1,929,946
R-squared	0.781	0.544	0.837	0.821	0.778	0.543	0.835	0.821
Panel B. perceived future financial risk								
Dep. Variable	$hesitation_o$		$return_i$		$hesitation_o$		$return_i$	
Treat*After	-0.116***		-0.092***		-0.052***		-0.036***	
	(0.027)		(0.009)		(0.011)		(0.003)	
ln(Payment)	0.115***		0.041***		0.116***		0.040***	
	(0.004)		(0.003)		(0.005)		(0.003)	
ΔPerGDP	0.171		0.104***		0.087		0.079***	
	(0.105)		(0.030)		(0.101)		(0.027)	
Observations	889,330		1,515,277		1,126,611		1,929,946	
R-squared	0.511		0.469		0.504		0.463	
Panel C. labor supply								
Dep. Variable	$shirking_o$				$shirking_o$			
Treat*After	0.071***				0.034***			
	(0.009)				(0.002)			
ΔPerGDP	-0.120***				-0.013			
	(0.023)				(0.022)			
Observations	889,330				1,126,611			
R-squared	0.543				0.54			
Buyer-Quarter FE	Yes				Yes			
Seller FE	Yes				Yes			
Date FE	Yes				Yes			

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Results: 3km Border Regression

Model	(1) C3 vs. C9				(2) C9 vs. C38			
Panel A. consumption								
Dep. Variable	$payment_o$	$quantity_o$	$payment_i$	$discount_i$	$payment_o$	$quantity_o$	$payment_i$	$discount_i$
Treat*After	0.079***	0.011	0.044**	-0.016	0.040***	0.002	0.048***	0.002
	(0.025)	(0.012)	(0.019)	(0.027)	(0.006)	(0.002)	(0.005)	(0.003)
ΔPerGDP	-0.020	0.005	-0.031	0.117*	0.022	0.022	-0.014	0.173***
	(0.037)	(0.016)	(0.039)	(0.061)	(0.036)	(0.017)	(0.033)	(0.053)
Observations	112,227	112,227	199,503	199,503	373,021	373,021	651,431	651,431
R-squared	0.734	0.451	0.795	0.779	0.738	0.437	0.796	0.776
Panel B. perceived future financial risk								
Dep. Variable	$hesitation_o$		$return_i$		$hesitation_o$		$return_i$	
Treat*After	-0.053**		-0.063***		-0.072***		-0.031***	
	(0.026)		(0.007)		(0.012)		(0.003)	
ln(Payment)	0.118***		0.036***		0.119***		0.043***	
	(0.009)		(0.003)		(0.005)		(0.003)	
ΔPerGDP	0.171		0.104***		0.087		0.079***	
	(0.105)		(0.030)		(0.101)		(0.027)	
Observations	112,227		199,503		373,021		651,431	
R-squared	0.404		0.322		0.384		0.337	
Panel C. labor supply								
Dep. Variable	$shirking_o$				$shirking_o$			
Treat*After	0.053***				0.033***			
	(0.010)				(0.004)			
ΔPerGDP	-0.120***				-0.013			
	(0.023)				(0.022)			
Observations	112,227				373,021			
R-squared	0.416				0.428			
Buyer FE	Yes				Yes			
Seller FE	Yes				Yes			
Date FE	Yes				Yes			

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Results: Buyer-YearMonth Level Regression

Model	(1) C3 vs. C38			(2) C9 vs. C38		
Panel A. Unbalanced Buyer-YearMonth Panel						
Dep. Variable	Payment	# of Orders	# of Items	Payment	# of Orders	# of Items
Treat*After	0.111***	-0.002	0.010**	0.046***	0.001	-0.002
	(0.012)	(0.003)	(0.005)	(0.006)	(0.001)	(0.002)
Observations	678,538	678,538	678,538	863,122	863,122	863,122
R-squared	0.477	0.346	0.360	0.477	0.337	0.359
Panel B. Balanced Buyer-YearMonth Panel						
Treat*After	0.013**	0.001	0.001	0.022***	0.002	0.002
	(0.006)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)
Observations	5,355,909	5,355,909	5,355,909	6,705,396	6,705,396	6,705,396
R-squared	0.110	0.121	0.117	0.109	0.119	0.117
Buyer FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes

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Results: Consumption Upgrade across Sellers

Dep. Variable	Seller Ranking	
Model	C3 vs C38	C9 vs C38
Treat*After	-0.023	-0.035
	(0.069)	(0.045)
ΔPerGDP	0.131	0.219
	(0.154)	(0.138)
Observations	889,330	1,126,611
R-squared	0.457	0.457
Buyer FE	Yes	Yes
Date FE	Yes	Yes

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