

An aerial photograph of New York City at sunset, showing a dense urban landscape with numerous skyscrapers and Central Park. A large, white circular graphic is overlaid on the image, featuring a solid inner circle and a dotted outer circle. The year '2018' is written in white, bold, sans-serif font inside the solid circle. A vertical white line passes through the center of the circles, with a small red dot at the top and a small white dot at the bottom. In the top-left corner, there are two white vertical bars of varying heights.

2018

Housing Price, Business Creation & Entrepreneurship

Chen LIN

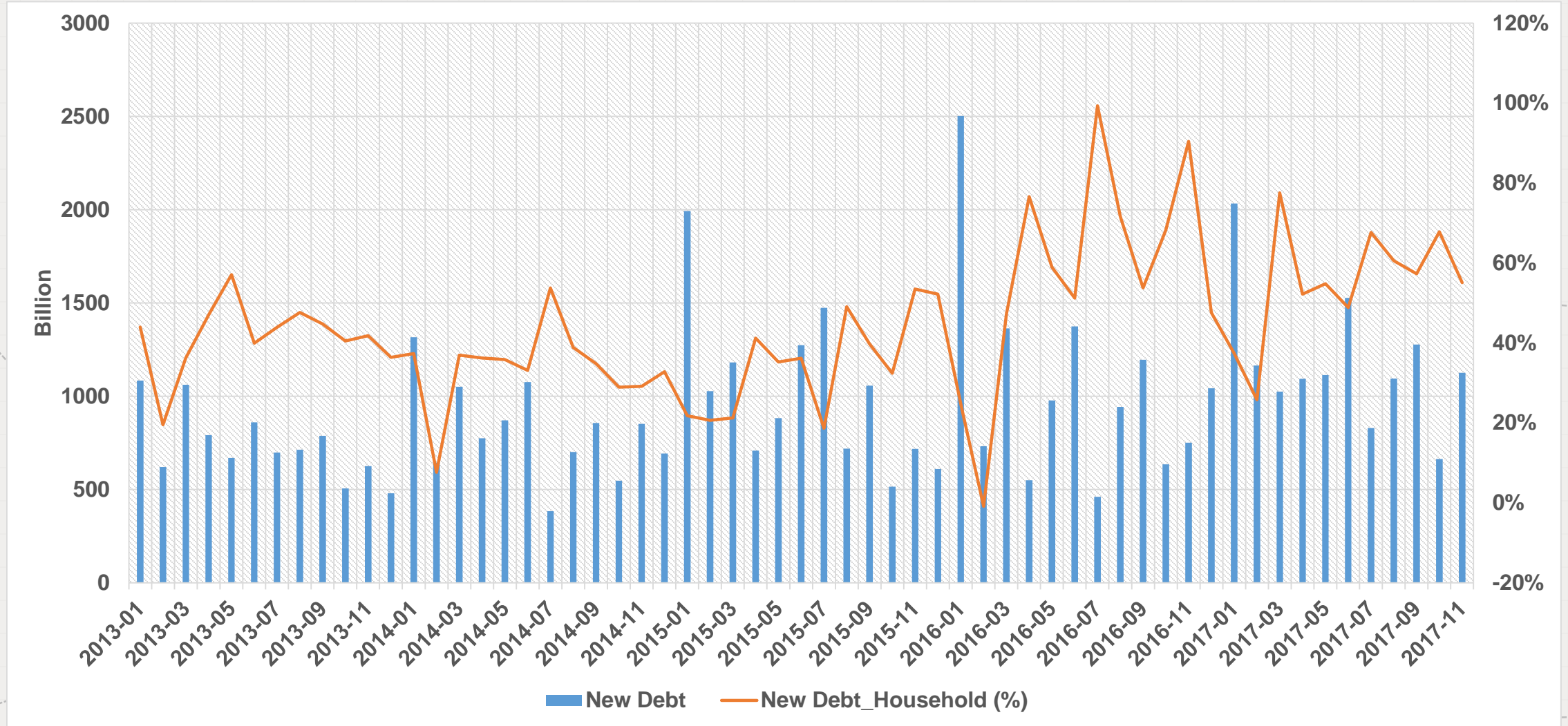


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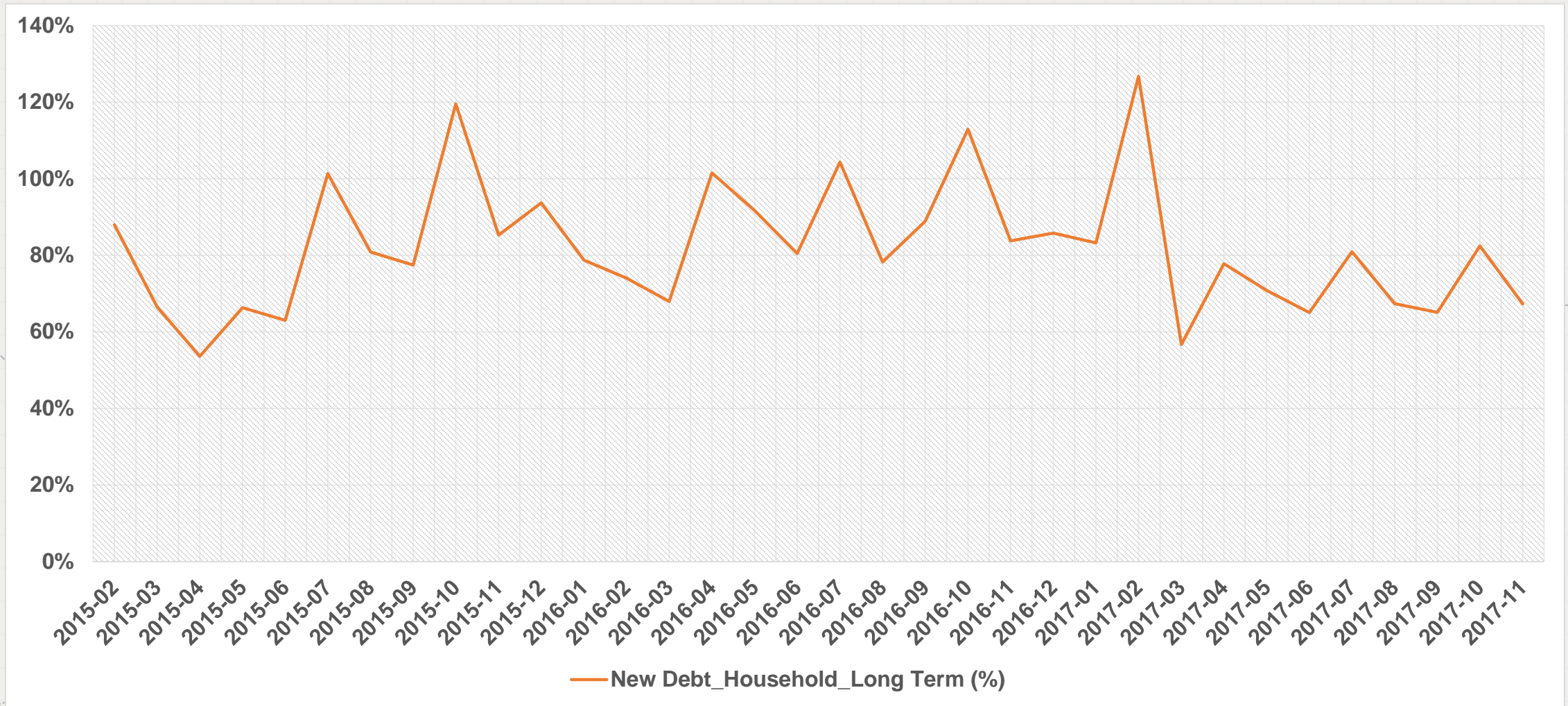
China's Nominal Residential Property Price Index



China's Monthly Domestic New (RMB) Debt



China's Monthly Household Long Term New Debt (%)



The real impact of Housing Price and Household Debt

- ❖ Homeowners borrow significantly **more** debt as their house prices appreciate
- ❖ An **increase** in the household debt/GDP ratio can predict **lower** GDP growth & **higher** unemployment in the medium run (Mian and Sufi, 2014, Mian, Sufi and Verner, 2017, QJE)

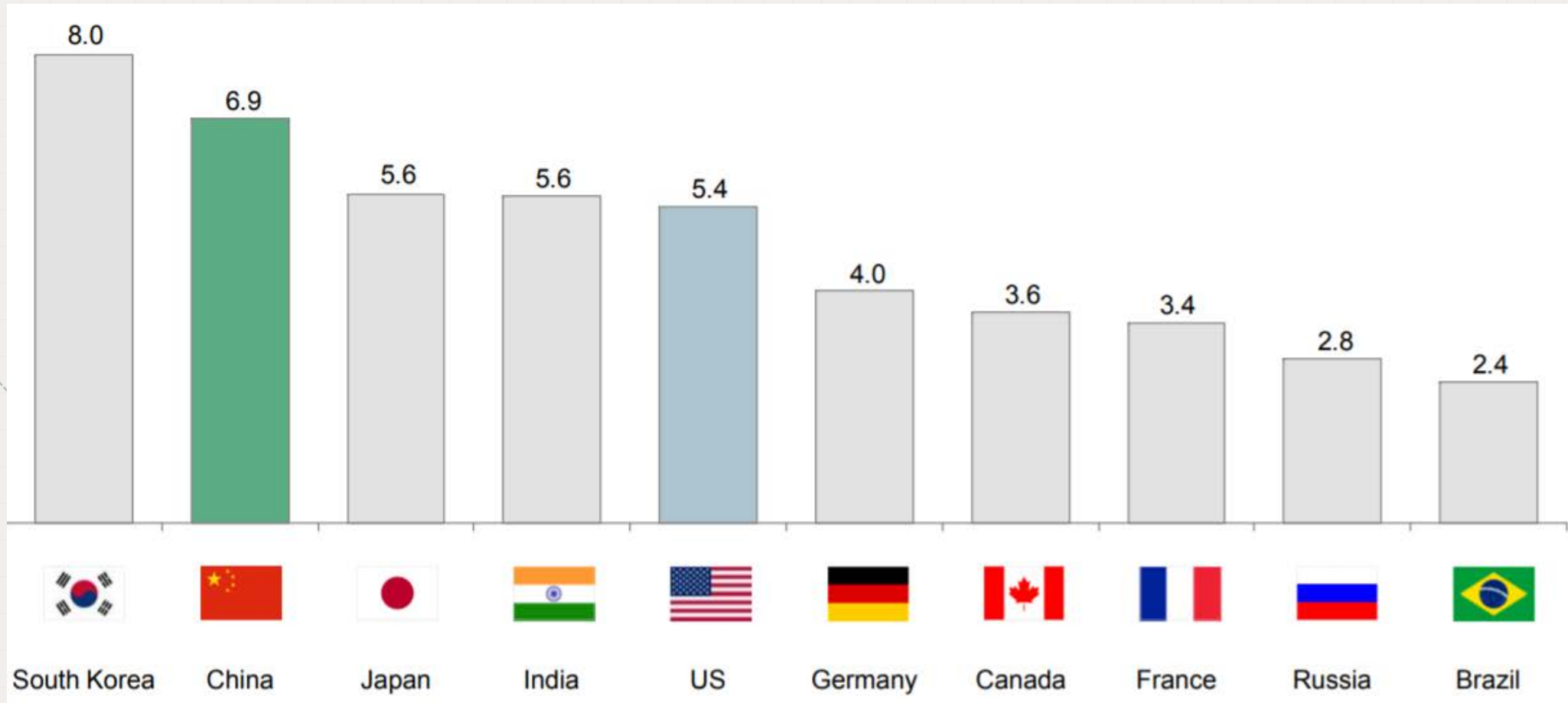
The real impact of Housing Price and Household Debt

- ❖ Corradin and Popov (2015, RFS): housing wealth helps **alleviate credit constraints** for potential entrepreneurs by enabling home owners to extract equity from their property and invest it in their business
- ❖ Schmalz et al. (2017, JF): an **increase** in collateral value leads to a **higher** probability of becoming an entrepreneur; more profound for homeowners
- ❖ Adelino et al. (2015, JFE): **small** business in areas with **greater** increases in house prices experienced **stronger** growth in employment; **more pronounced** in industries that need little start-up and capital

Motivation

- ❖ How will housing price appreciation **influence** (**stimulate/depress**) entrepreneurship activities?
 - Collateral channel: housing price \uparrow credit constraints \downarrow
 - Cost channel: housing price \uparrow operating costs \uparrow
 - Speculation channel: housing price \uparrow non-land investment \downarrow
- ❖ Transition from **offline** business to **online** business?
 - Cost-saving: wages, rents,...
 - Access to credit: micro credit availability
 - Low entry barrier: business registration is **NOT** required

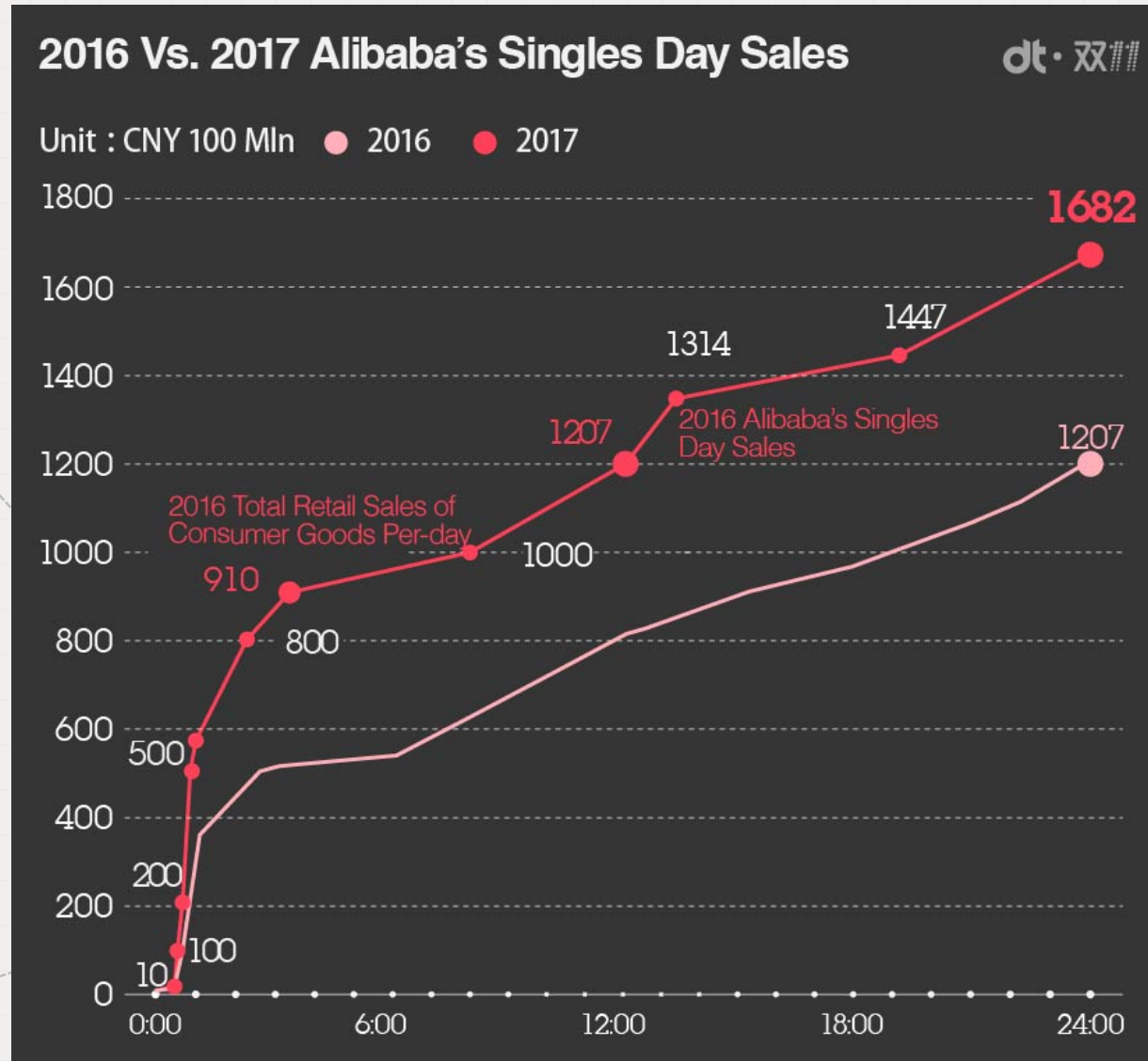
Development of Online Business



Share of Internet-Driven GDP of Total GDP (% , 2016)

❖ Internet-related activities contribute 6.9% of China's GDP

Online Business Platform: Taobao



淘宝网
Taobao.com

天猫 Tmall.com 

阿里巴巴 
Alibaba.com™

❖ Taobao: the largest online business platform

Online Business : Entrepreneurship on Taobao

**Businesses
16+ million**

Alibaba platform accommodates **16+ million** merchants, among which **97%** employ less than **5** persons

**Employment
30.83 million**

Alibaba retail ecosystem creates 30.83 million job opportunities in China, including 11.76 million transaction-related ones and 19.07 million indirect ones

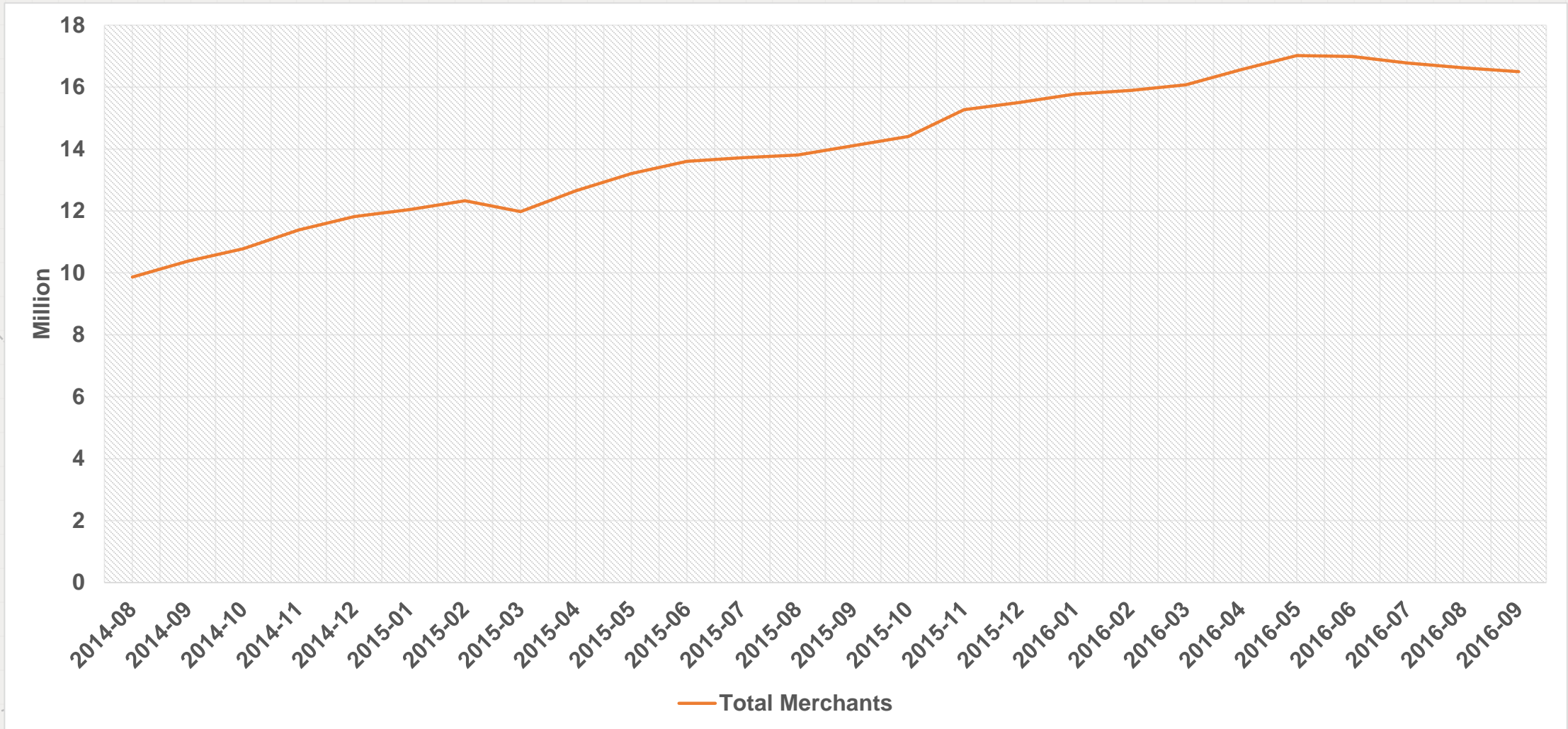
**Women
6 million**

49.4% of active online stores owners in Alibaba retail ecosystem are female and contribute to **46.7%** of the total sales. Taobao store is the top priority for more than 6 million women who want to start their own business

**Disabled
0.16 million**

There were more than 160,000 disabled sellers on the Taobao retail platform with total transaction volume of more than USD 1.9 billion

Online Business: Entrepreneurship on Taobao



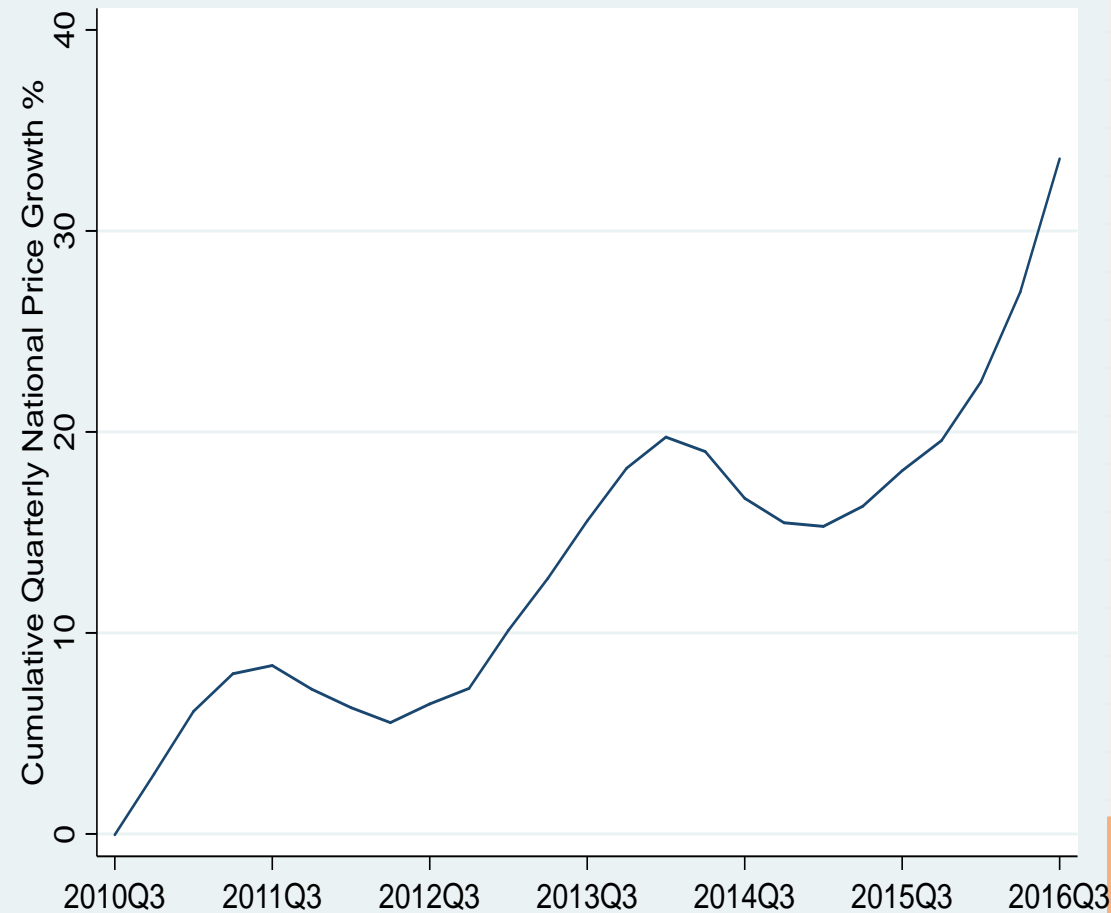
Major Finding

“ Housing price appreciation
curbs offline business creation but
stimulates online entrepreneurial
activities ”

Literature Review: Housing Booms in China

- ❖ Chen et al. (2016): real estate shocks can also affect corporate investment through **speculation** channel (land investment) & **crowding out** channel (land-holding firms receive more loans)
- ❖ Shi (2017): real estate boom caused the a significant pattern of **capital reallocation** within existing private businesses from the manufacturing sector to the real estate sector; this pattern happens among the more productive private businesses
- ❖ Chen, Ting, Liu, Xiaolei., Xiong, Wei., & Zhou, Lian. (2016). The speculation channel and crowding-out channel: Real estate shocks and corporate investment in china. Working Paper.
- ❖ Shi, Yu. (2017). Real Estate Booms and Endogenous Productivity Growth. Working Paper..

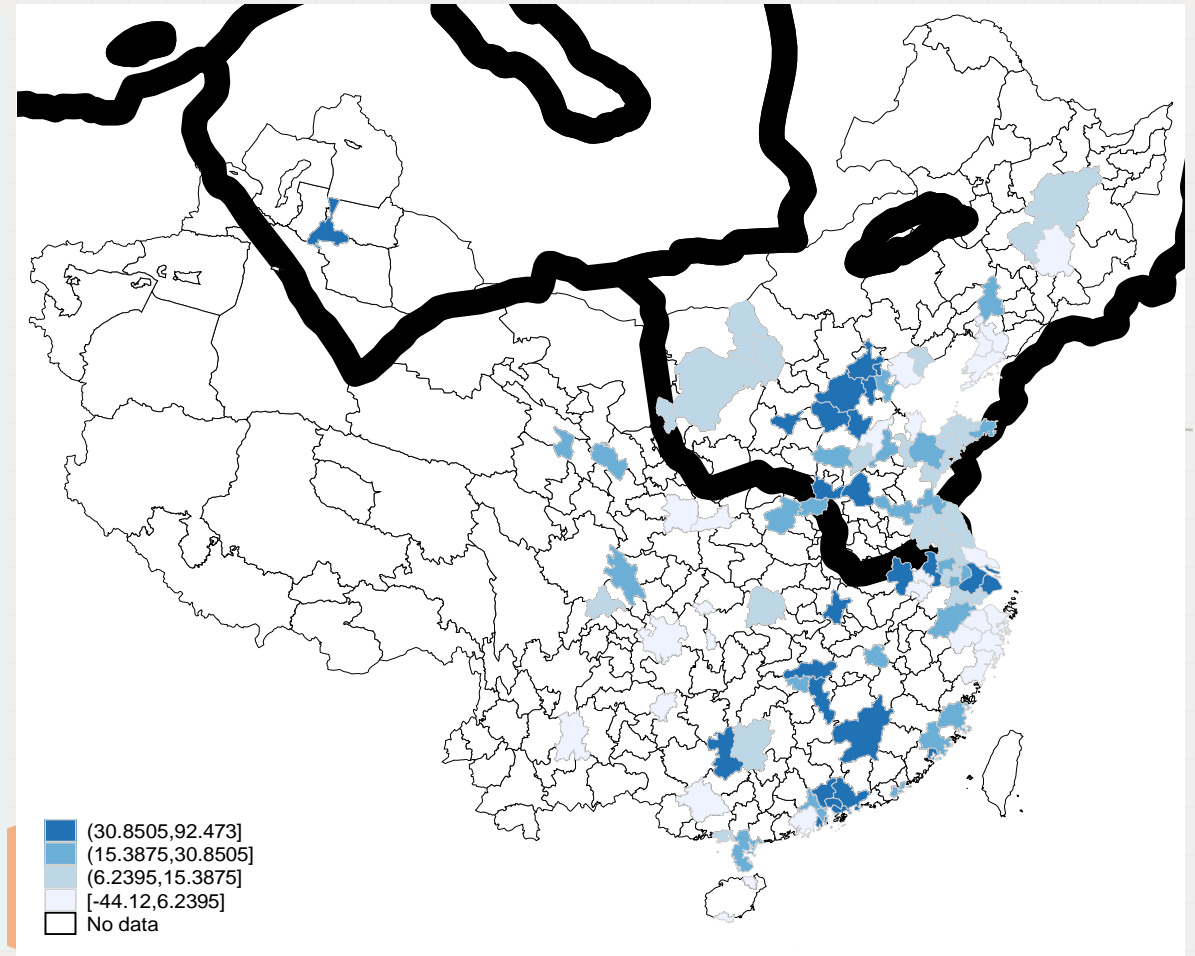
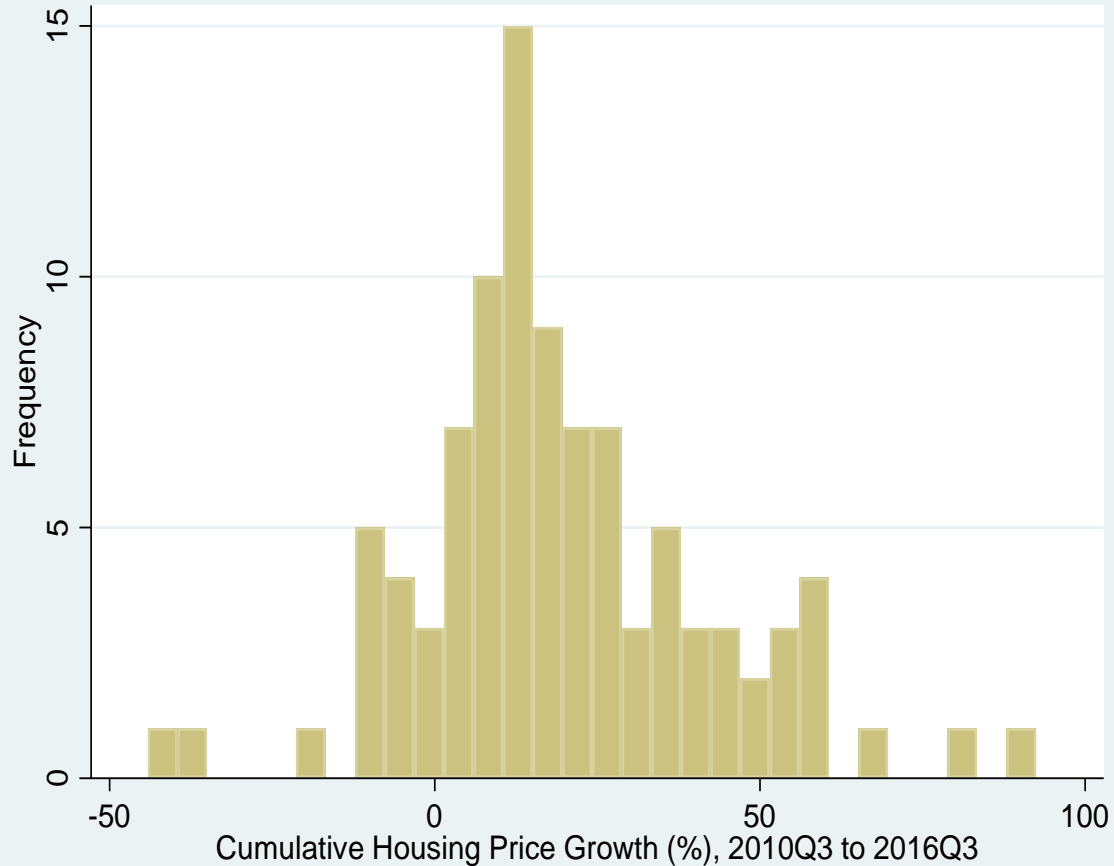
Housing Price Appreciation in China



Quarterly Cumulative Growth of National Housing Price (%)

- ❖ The figure plots **quarterly cumulative growth** of national housing price in percentage
- ❖ The sample contains 100 Chinese cities between **2010Q3** and **2016Q3**
- ❖ The data is from **CREIS** database

Housing Price Appreciation in China



Quarterly Cumulative Growth of National Housing Price (%)

Housing Price Appreciation in China

10 cities with largest price growth

City	Cumulative City Price Growth from 2010Q3 to 2016Q3 (%)
深圳/Shen Zhen	92.47
厦门/Xia Men	80.87
珠海/Zhu Hai	66.20
东莞/Dong Guan	58.70
北京/Bei Jing	58.38
廊坊/Lang Fang	58.19
上海/Shang Hai	57.59
保定/Bao Ding	54.85
合肥/He Fei	54.24
南京/Nan Jing	52.35

10 cities with lowest price growth

City	Cumulative City Price Growth from 2010Q3 to 2016Q3 (%)
三亚/San Ya	-44.12
海口/Hai Kou	-38.51
绍兴/Shao Xing	-17.77
台州/Tai Zhou	-10.18
马鞍山/Ma Anshan	-9.42
金华/Jin Hua	-8.64
宁波/Ning Bo	-8.38
南通/Nan Tong	-8.14
贵阳/Gui Yang	-7.47
吉林/Ji Lin	-7.33

Empirical Challenge

- ❖ Traditional approach (Schmalz et al., JF, 2017)

$$E_{i,j,t+1} = \alpha + \beta \cdot Owner_{i,t} \times \Delta p_j^{t-6 \rightarrow t-1} + \theta \cdot Owner_{i,t} \\ + \gamma \cdot Z_{i,t} + \tau \cdot Z_{i,t} \times \Delta p_j^{t-6 \rightarrow t-1} + \delta_l + \delta_{jt} + \varepsilon_{i,j,t},$$

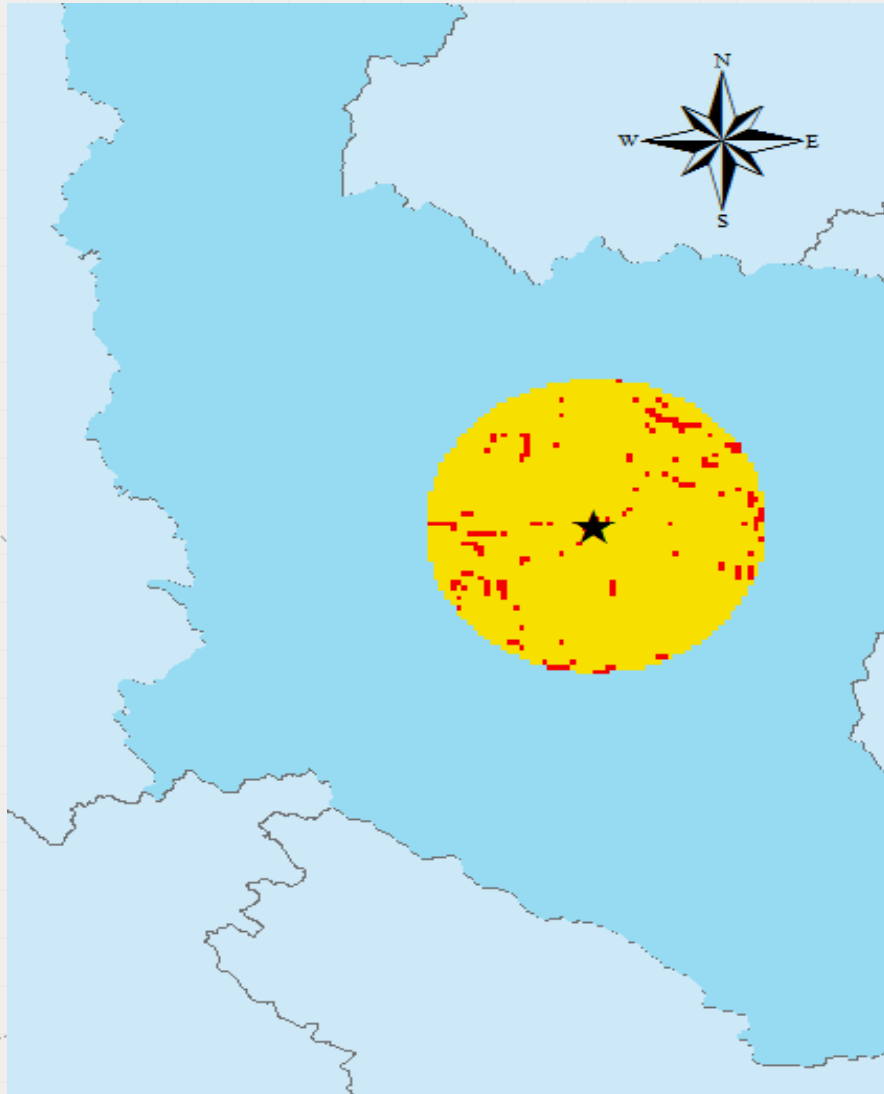
- ❖ Endogeneity

- **Housing price:** highly endogenous
- **Omitted variable:** unobserved factors affect both housing price and entrepreneurial activities
- **Reverse causality:** the expected entrepreneurial activities may affect the housing demand and price

Land Supply Elasticity Construction

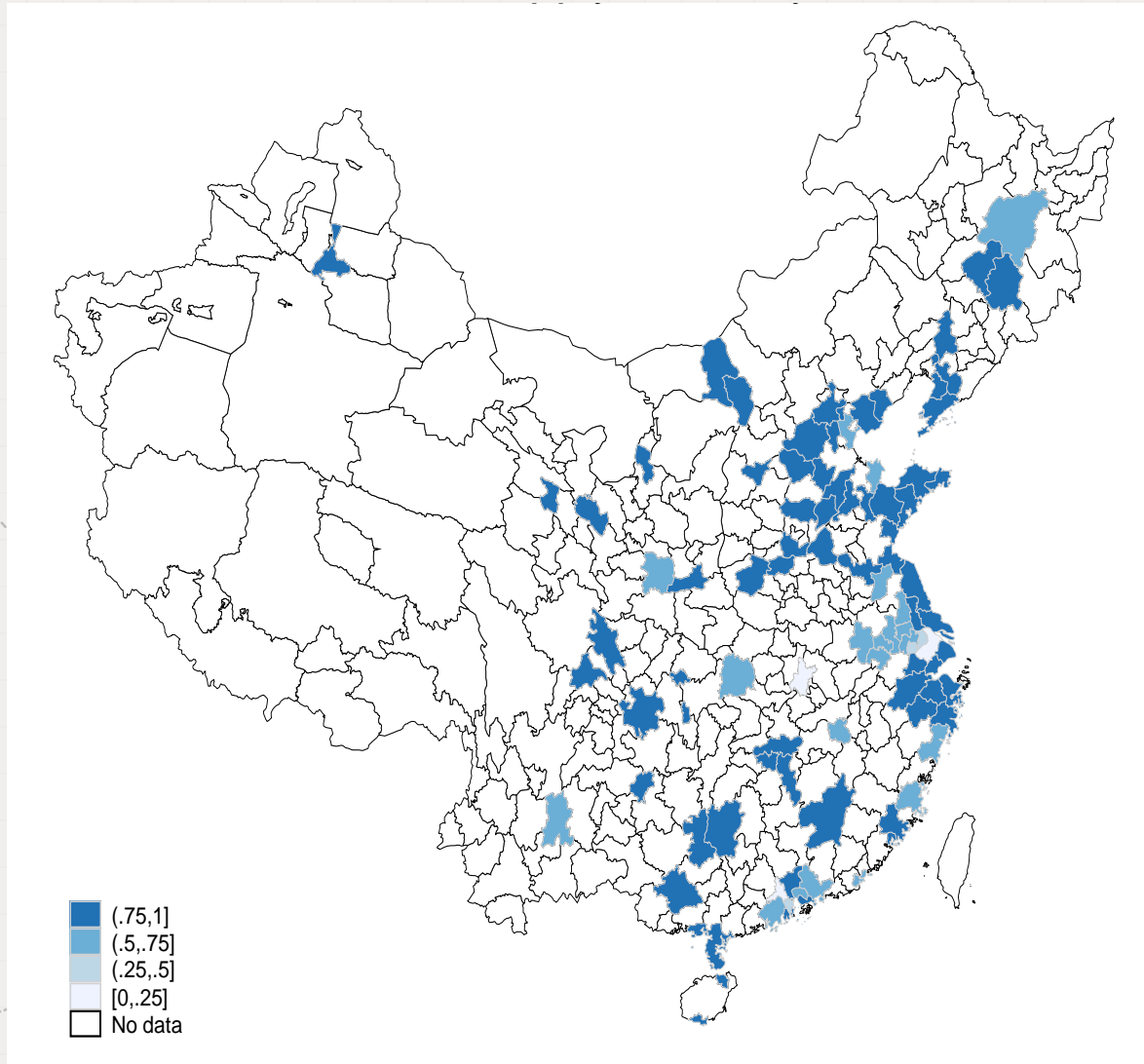
- ❖ The method basically follows Saiz (2010) who stressed the supply-side response to housing demand shocks
- ❖ Mian and Sufi (2011) adopt a similar approach
- ❖ Shi (2017) also uses this method in the context of China
- ❖ **Land supply elasticity**: the percentage of **developable** land within 30 kilometer radii from central point of each city (normalized to a 0 to 1 scale)

Construction of Land Supply Elasticity



- ❖ This figure presents the map of the city of Ankang, Shaanxi province
- ❖ The **star** indicates the center of the city as proxied by the location of the city government
- ❖ **Orange areas** denote developable land within 30 kilometer radii from central point of each city, whereas **red areas** are undevelopable land
- ❖ The **undevelopable land** is defined as area with slope over 10%

Spatial Distribution of Land Supply Elasticity



- ❖ This figure plots the **spatial distribution** of the land supply elasticity measure for our sample cities
- ❖ The sample contains 100 cities

First Stage Regression

	(1)	(2)	(3)	(4)	(5)
	City Price Growth		Log(GDP per capita)	GDP Growth	Ln(population)
National Price Growth X (1-Elasticity)	0.9250*** [0.1671]	0.9264*** [0.1681]	0.0007 [0.0033]	-0.0137 [0.0550]	0.0003 [0.0008]
National Price Growth (1-Elasticity)	0.4770*** [0.0495]				
	-0.9684*** [0.3545]				
City FE	No	Yes	Yes	Yes	Yes
Year-Quarter FE	No	Yes	Yes	Yes	Yes
F-value		30.36			
N	2318	2318	2318	2318	2318
R2	0.2146	0.3849	0.9825	0.7883	0.9960

- ❖ Model (2) is the one to use for instrument variable regression
- ❖ Model (3) – (6) suggest the instrument is insignificantly correlated with some major economic factors
- ❖ The standard error clustered at city level is reported in the parenthesis

Data: Housing Prices

- ❖ Quarterly housing price at city level from China Real Estate Index System (CREIS) database
- ❖ Chinese equivalent of Zillow: constructed and maintained by China Index Academy, which is the largest independent property research organization with more than 15 offices in China
- ❖ The database contains a **monthly housing price index** for 100 cities in China. The index is constructed using real-time transaction data in cities across China

Data: Offline Entries

- ❖ Business registration information from State Administration for Industry and Commerce (SAIC)
- ❖ The database contains all business registration information in China, including information about registration date, name of the owner, type of registration (individual owner or not), industries, date of regulatory check, registered capital...
- ❖ The database contains both active firms and cancelled firms. Our current sample contains more than 80 million business entities across China

Data: Online Entries

- ❖ Ant Financial: the entire universe of shops in Taobao
- ❖ The Taobao Shops information we used in this study contains the entire universe of shops on Taobao platform between 2014Q3 and 2016Q3.
- ❖ The sample consists of **4.3 million** unique shops that were active between 2014Q3 and 2016Q3 with precise location and demographic characteristics of shop owners, of which **1.2 million** distinct shops were registered after 2014Q3

Data: Online Entries

- ❖ The **shop** information includes the date of registration, shop's location, and sales for each month
- ❖ The **demographic** information of shop owners includes the age, gender, marital status and birthplace of the owner
- ❖ An **estimated probability of house ownership** status is also included

Variable Definitions

Variable	Definition
<i>City-level Entries</i>	
Offline entries	Number of new firms registered in a quarter
Offline entries (real estate)	Number of new real estate firms registered in a quarter
Offline entries (finance)	Number of new financial firms registered in a quarter
Offline entries (retail)	Number of new retail firms registered in a quarter
Offline entries (others)	Number of newly registered firms that are not categorized as real estate, finance, or retail in a quarter
Offline entries (individual owner=1)	Number of new firms registered as individual owner in a quarter
Offline entries (individual owner=0)	Number of new firms that are not registered as individual owner in a quarter
Online entries	Number of new shops registered in the Taobao platform in a quarter
Online exits	Number of shop cancellations in the Taobao platform in a quarter

Variable Definitions

City-level Economic Factors

City Price Growth

Quarterly housing price growth at city level

National Price Growth

Quarterly national housing price growth

Elasticity

A city's land supply elasticity defined as the percentage of developable land within 30 kilometer radii from central point of each city. The undevelopable land is defined as area with slope over 10%.

Log(GDP per capita)

Log of GDP per capita

GDP Growth

GDP growth

Ln(population)

Log of population in a city

- ❖ We control for $\ln(\text{GDP per capita})$, GDP Growth, and $\ln(\text{Population})$ in all the specifications

Variable Definitions

Shop-level

Sales Growth

Sales growth

Log(Sales)

Log of sales in a quarter

Shop Owner Characteristics

Have_house

The probability that a shop owner owns a house

Age

The Age of the shop owner

Married

A indicator set to one if the shop owner is married

Migrant

A indicator set to one if the birthplace of the shop owner is different from the operating city of the shop

Summary Statistics

- ❖ Sample period: 2010Q3~2016Q3
- ❖ For variables for online business (Taobao), the sample period starts from 2013Q3
- ❖ Exit variables for online business starts from 2014Q4

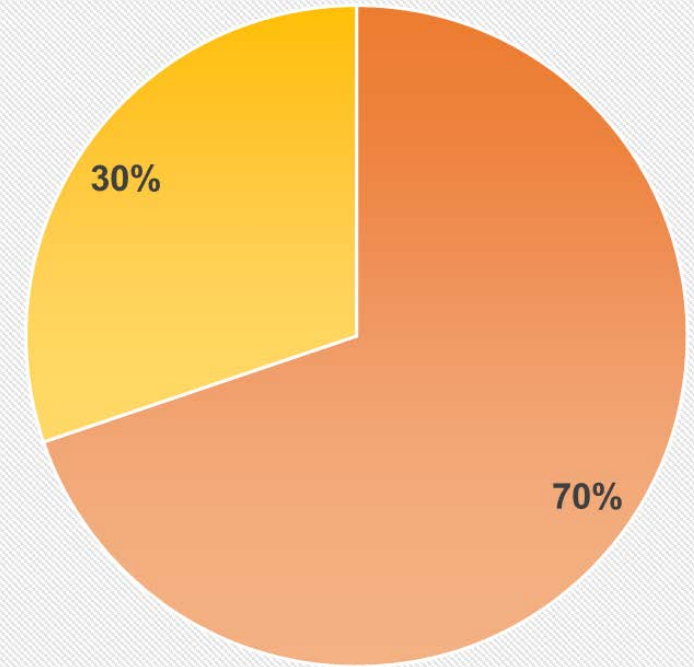
Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
<i>City-level Entries</i>								
Offline entries	2,272	8594.459	8492.73	530	3545	5849.5	10000	8.80E+04
Offline entries (real estate)	2,272	448.707	490.556	21	161	278.5	542	4723
Offline entries (finance)	2,272	55.247	266.508	0	10	19	40	5294
Offline entries (retail)	2,272	4041.43	3941.596	254	1679	2820	4857	42000
Offline entries (others)	2,272	4049.075	4324.506	173	1622	2691.5	4773.5	59000
Offline entries (individual owner=1)	2,272	3852.043	3847.418	199	1749.5	2887.5	4773.5	84000
Offline entries (individual owner=0)	2,272	4742.416	6468.336	331	1447	2694.5	5107.5	58000
Online entries	1,328	1246.011	1868.869	8	270	634	1473.5	1.50E+04
Online exits	663	1640.845	2296.282	72	410	879	1898	1.80E+04

Summary Statistics

Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
<i>City-level Economic Factors</i>								
City Price Growth	2,368	0.789	2.962	-9.36	-0.968	0.42	2.157	15.97
National Price Growth	2,368	1.346	2.009	-2.32	-0.18	1.5	2.86	6.63
Elasticity	2,318	0.803	0.202	0	0.736	0.875	0.93	1
Log(GDP per capita)	2,368	5.67	0.782	2.853	5.139	5.618	6.186	7.829
GDP Growth	2,368	11.2	2.786	2.6	9.3	11	13.1	23
Ln(population)	2,368	8.456	0.631	6.323	8.082	8.546	8.895	10.427
<i>Shop-level</i>								
Sales Growth	994,327	1.309	7.519	-1	-1	-0.5	0.5	74
Log(Sales)	3,072,076	3.008	4.031	0	0	0	6.804	18.446

Common Database

- ❖ Wind/CSMAR: covers **only** listed firms
- ❖ Chinese Industrial Enterprises Database: covers **only** state-owned, or non-state firms with sales above 5 million RMB (“above-scale” industrial firms)



2015 Market Participants in China

Our Data Advantages

- ❖ Individual business (个体工商户)
 - The **most common** form of business structure
 - **Usually** one individual or married couple in business alone
 - **Greater** flexibility & **fewer** taxes
 - The business owner is personally liable for **all debts** incurred by the business
- ❖ Individual owner dummy: whether the new firm is registered as individual owner

Housing Price & Offline Business

	(1)	(2)	(3)
	OLS	Log(Offline entries A) _{t+1} Reduced-form	IV
City Price Growth (t)	-0.0022 [0.0029]	-0.0358*** [0.0132]	-0.0389*** [0.0144]
Ln(GDP per capita)	0.4023*** [0.1374]	0.3960*** [0.1390]	0.3960*** [0.1390]
GDP Growth	0.0042 [0.0059]	0.0015 [0.0059]	0.0015 [0.0059]
Ln(population)	0.3910** [0.1736]	0.3715** [0.1723]	0.3715** [0.1723]
City FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
N	2272	2224	2224
R2	0.9182	0.9201	0.9201

- ❖ This table reports the effect of housing price appreciation on **offline** business creation at city-quarter level in 100 cities between 2010Q3 and 2016Q3
- ❖ One unit increase in city price growth will translate into a **3.58%-3.89% decrease** in **offline** business entries

Offline Business: Entries by Industries

	(1) OLS	(2) Reduced-form	(3) IV
Panel A: Log(Offline entries, Real estate),t+1			
City Price Growth (t)	0.0049*	-0.0063	-0.0068
	[0.0027]	[0.0100]	[0.0108]
N	2272	2224	2224
R2	0.9519	0.9542	0.9542
Panel B: Log(Offline entries, Finance),t+1			
City Price Growth (t)	0.0125*	0.0413	0.0450
	[0.0072]	[0.0290]	[0.0315]
N	2272	2224	2224
R2	0.6993	0.7035	0.7035
Panel C: Log(Offline entries, Retail),t+1			
City Price Growth (t)	-0.0061**	-0.0365**	-0.0397**
	[0.0026]	[0.0153]	[0.0166]
N	2272	2224	2224
R2	0.8981	0.9001	0.9001
Panel D: Log(Offline entries, Others),t+1			
City Price Growth (t)	-0.0012	-0.0434***	-0.0472***
	[0.0036]	[0.0139]	[0.0151]
N	2272	2224	2224
R2	0.9156	0.9172	0.9172
Controls	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes

❖ This table reports the **heterogeneous effect** of housing price appreciation on **offline** business creation according to **type of sectors**

Offline Business: Entries by Registration Type

	(1)	(2)	(3)
	OLS	Reduced-form	IV
Panel A: Log(Offline entries, Individual Owner=1),t+1			
City Price Growth (t)	-0.0144***	-0.0741***	-0.0806***
	[0.0035]	[0.0204]	[0.0221]
N	2272	2224	2224
R2	0.7942	0.7937	0.7937
Panel B: Log(Offline entries, Individual Owner=0),t+1			
City Price Growth (t)	0.0035	-0.0065	-0.0071
	[0.0027]	[0.0080]	[0.0087]
N	2272	2224	2224
R2	0.9735	0.9742	0.9742
Controls	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes

- ❖ This table reports the **heterogeneous effect** of housing price appreciation on **offline** business creation according to **registration type**

Online Business

- ❖ Until now, most researches **only focus** on the offline business dynamics
- ❖ Our data for **online** business: Taobao
 - The major retail platform of Alibaba
 - Serves self-employed individuals & small businesses



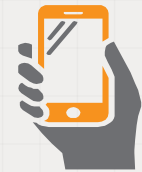
16+ Million

Annual Active Sellers



454 Million

Annual Active Buyers

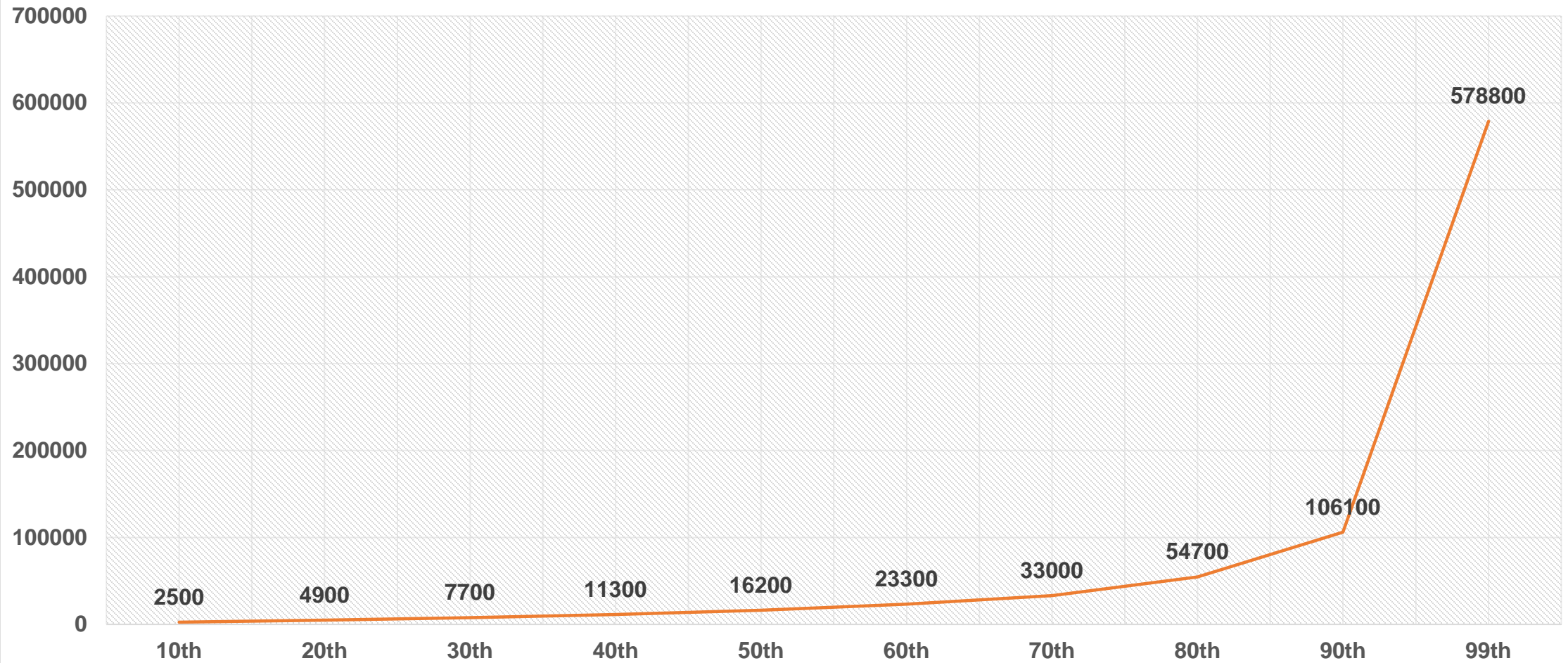


507 Million

Mobile MAUs

Taobao Platform

Monthly Sales Distribution (CNY)



MyBank (阿里网商贷, 原蚂蚁微贷、阿里小贷)



- ❖ Ant financial collects information from Taobao platform and applies a credit model with machine learning to decide on **credit qualification**
- ❖ Qualified online shops receive an **credit line** including loan rate, maximum loan amount (up to 1 million RMB), maturity (6 months to **1 year**) and loan contract
- ❖ Shops decide whether to **accept** the non-collateral loan offer or not, based on the loan rate and repayment **schedule**
- ❖ **Repayment** anytime, and credit score update daily

Online Business: Entries & Exits

	(1)	(2)	(3)
	OLS	Reduced-form	IV
	Panel A: Log(Online entries),t+1		
City Price Growth (t)	-0.0000	0.0454***	0.0494***
	[0.0024]	[0.0108]	[0.0118]
N	1328	1300	1300
R2	0.9863	0.9866	0.9866
	Panel B: Log(Online exits),t+1		
City Price Growth (t)	-0.0060***	-0.0208**	-0.0227**
	[0.0019]	[0.0099]	[0.0108]
N	663	649	649
R2	0.9922	0.9919	0.9919
Controls	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes

- ❖ This table reports the effect of housing price appreciation on **online** business creation
- ❖ For online **entries**, the sample period starts from 2013Q1; For online exits, the sample period starts from 2014Q1
- ❖ One unit increase in city price growth will translate into a **4.54%-4.94% increase** in **online** business entries

Online Business: Entries by House Ownership

	(1)	(2)	(3)
	OLS	Reduced-form	IV
	Panel A: Log(Online entries _t Have_house _t ≥ 0.5), t+1		
City Price Growth (t)	0.0017	0.0608***	0.0661***
	[0.0023]	[0.0110]	[0.0120]
N	1328	1300	1300
R2	0.9880	0.9886	0.9886
	Panel B: Log(Online entries _t Have_house _t < 0.5), t+1		
City Price Growth (t)	-0.0020	0.0346**	0.0377**
	[0.0029]	[0.0134]	[0.0146]
N	1328	1300	1300
R2	0.9786	0.9789	0.9789
	Panel C: Log(Online entries _t Have_house _t ≥ 0.7), t+1		
City Price Growth (t)	0.0020	0.0624***	0.0678***
	[0.0023]	[0.0115]	[0.0125]
N	1328	1300	1300
R2	0.9881	0.9885	0.9885
	Panel D: Log(Online entries _t Have_house _t < 0.3), t+1		
City Price Growth (t)	-0.0011	0.0367***	0.0399***
	[0.0030]	[0.0136]	[0.0148]
N	1328	1300	1300
R2	0.9774	0.9776	0.9776
Controls	Yes	Yes	Yes
City FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes

- ❖ This table reports the **heterogeneous effect** of housing price appreciation on **online** business creation according to **shop owner's house ownership** (estimated from a probability model)

Online Business: House Ownership & Owner Age

	(1)	(2)	(3)	(4)
	Panel A: Log(Online entries, Have_house \geq 0.5),t+1			
	Age \leq 25	Age: (25,35]	Age: (35,45]	Age: >45
City Price Growth (t)	0.0782*** [0.0146]	0.0659*** [0.0133]	0.0271* [0.0160]	0.0254 [0.0220]
N	1300	1300	1300	1300
R2	0.9798	0.9848	0.9633	0.9324
	Panel B: Log(Online entries, Have_house<0.5),t+1			
	Age \leq 25	Age: (25,35]	Age: (35,45]	Age: >45
City Price Growth (t)	0.0468** [0.0227]	0.0488*** [0.0154]	0.0467** [0.0230]	0.0506** [0.0253]
N	1300	1300	1300	1300
R2	0.9601	0.9716	0.9401	0.9215
Controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes

- ❖ This table reports the IV regression results for **heterogeneous effect** of housing price appreciation on **online** business creation according to **shop owner's house ownership & age**

Online Business: House Ownership & Marital Status

	(1)	(2)
	Panel A: Log(Online entries, Have_house \geq 0.5),t+1	
	Married=1	Married=0
City Price Growth (t)	0.0611*** [0.0138]	0.0679*** [0.0136]
N	1300	1300
R2	0.9842	0.9839
	Panel B: Log(Online entries, Have_house $<$ 0.5),t+1	
	Married=1	Married=0
City Price Growth (t)	0.0437*** [0.0164]	0.0389** [0.0173]
N	1300	1300
R2	0.9711	0.9724
Controls	Yes	Yes
City FE	Yes	Yes
Year-Quarter FE	Yes	Yes

- ❖ This table reports the IV regression results for **heterogeneous effect** of housing price appreciation on **online** business creation according to **shop owner's house ownership & marital status**

Online Business: House Ownership & Birthplace

	(1)	(2)
	Panel A: Log(Online entries, Have_house \geq 0.5),t+1	
	Migrant=1	Migrant=0
City Price Growth (t)	0.0629*** [0.0118]	0.0535** [0.0224]
N	1300	1300
R2	0.9884	0.9450
	Panel B: Log(Online entries, Have_house<0.5),t+1	
	Migrant=1	Migrant=0
City Price Growth (t)	0.0395*** [0.0149]	0.0238 [0.0197]
N	1300	1300
R2	0.9781	0.9464
Controls	Yes	Yes
City FE	Yes	Yes
Year-Quarter FE	Yes	Yes

- ❖ This table reports the IV regression results for **heterogeneous effect** of housing price appreciation on **online** business creation according to **shop owner's house ownership & birthplace**

Online Business: House Ownership & Gender

	(1)	(2)
	Panel A: Log(Online entries, Have_house \geq 0.5),t+1	
	Male	Female
City Price Growth (t)	0.0516*** [0.0133]	0.0746*** [0.0135]
N	1300	1300
R2	0.9841	0.9859
	Panel B: Log(Online entries, Have_house $<$ 0.5),t+1	
	Male	Female
City Price Growth (t)	0.0274* [0.0158]	0.0544** [0.0231]
N	1300	1300
R2	0.9749	0.9675
Controls	Yes	Yes
City FE	Yes	Yes
Year-Quarter FE	Yes	Yes

- ❖ This table reports the IV regression results for **heterogeneous effect** of housing price appreciation on **online** business creation according to **shop owner's house ownership & gender**

Housing Price & Expansion of Online Business

	(1)	(2)
	Sales Growth, t+1	Log(Sales), t+1
City Price Growth (t)	-0.2640*** [0.0743]	-0.0572* [0.0292]
City Price Growth (t) X Have_house	0.3878*** [0.0916]	0.0515* [0.0297]
Controls	Yes	Yes
Shop FE	Yes	Yes
Year-Quarter FE	Yes	Yes
N	994327	3072076
R2	0.3065	0.7064

- ❖ This table reports the IV regression results for the effect of housing price appreciation on the **expansion** of **online** business

Conclusion

- ❖ Using the unique data of business registration information and the entire universe of online shops on the largest e-commerce platform in China, we find housing price appreciation **curbs offline** business creation but **stimulates online** entrepreneurial activities.
- ❖ This effect is **more pronounced** among house-owners
- ❖ We also explore the **heterogeneous effect** of housing price according to the demographic characteristics of the shop owners
- ❖ Housing price appreciation also leads to online business **expansion** as measured by sales growth



2018
THANKS

