Behavioural Economics and Housing Decisions

Lecture Three: Housing Provident Fund and Homeownership

By Helen Bao

Outline

- Research questions

- Why homeownership matters?

- Behavioural tools at our disposal

- Housing provident fund in China

- Data and methods

- Findings and discussions

- Future research directions

Research Questions

- Did Housing Provident Fund Help Chinese Households to Achieve Homeownership?

- Did Housing Provident Fund Help Chinese Households to Purchase a Second Home?

- Related questions:
  - What's the benefit of being a homeowner?
  - What behavioural interventions are relevant and useful?
  - How to conduct good research to support policy and decision making in this area?

What's the benefit of being a homeowner?

- Homeowners are happier (higher utility in economic terms, Henderson, J. V. and Y. M. Ioannides (1983). "A Model of Housing Tenure Choice." *American Economic Review* 73[1]: 98-113.)

- A symbol of success (Rowlands and Gurney, 2000)

- Conformity - to be on the team (Ben-Shahar, 2007)

- Get married before 30, and find a taller wife (Fang and Tian, 2018)

- Think about the pandemic – would you rather to be a homeowner or renter? (Kuk, J., et al., 2021, "The COVID-19 Pandemic and the Rental Market: Evidence From Craigslist." American Behavioral Scientist. 65(21): 1623-1648)

What's the benefit of being a homeowner?

- A symbol of success: Rowlands, R. and C. M. Gurney (2000). "Young peoples' perceptions of housing tenure: A case study in the socialization of tenure prejudice." *Housing, Theory & Society* 17(3): 121-130.

  - Interviews of 15 – 16 years-old students from two high schools in England

  - Semi-structured interviews covering three questions: where the participants currently live, where the participants would like to live, and what their views were about council housing.

  - Sample size: 16 (!!!)

  - "Housing is a consumer good and one that sends strong social messages. … the picture of council housing in the eyes of the children interviewed is a poor one."

  - "a perpetuation and potential deepening of the residualization of council housing and the further exclusion of those who live in it."

What's the benefit of being a homeowner?

- Conformity - to be on the team: Ben-Shahar, D. (2007). "Tenure choice in the housing market - Psychological versus economic factors." *Environment and Behavior* 39(6): 841-858.

  - Survey of 315 college freshman students in Isreal

  - A combination of economics and psychological questions regarding housing tenure choice

  - Economic questions: taxes and other transaction costs, risk, tenure duration, wealth constraint, and flawed financial reasoning

  - Psychological questions: stability, high social status, peace of mind, success, and happiness

The Questions From Which the Individual Economic Tenure Choice Measure Is Derived

Questions Defining the Variable	Possible Responses
"Ignoring all other factors, would you tend to prefer either tenancy or ownership due to the following factor: *taxes* (such as purchase and sales tax)?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or ownership due to the following factor: additional transaction costs associated with the transaction?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: the risk associated with fluctuations in sell and buy prices?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: the risk associated with fluctuations in rental prices?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: long expected tenure duration?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: the burden of mortgage payments compared to that of the rent installments?"	1 – Ownership 2 – Irrelevant 3 – Tenancy

The Questions From Which the Individual Psychological Tenure Choice Measure Is Derived

Questions Defining the Variable	Possible Responses
"Ignoring all other factors, would you tend to prefer either tenancy or ownership due to the following factor: sense of freedom and independence?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or ownership due to the following factor: better psychological feeling?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: sense of attachment to the housing unit?"	1 – Ownership 2 – Irrelevant 3 – Tenancy
"Ignoring all other factors, would you tend to prefer either tenancy or homeownership due to the following factor: marriage?"	1 – Ownership 2 – Irrelevant 3 – Tenancy

"Indicate the level of your identification with the following statement: 'I believe that at a certain period in one's life- time a person should own a housing unit.'" Yes = 1.

Table 8
Summary Statistics

Variable	M	Mdn	Maximum	Minimum	SD
TenureChoice	.08	.00	1.00	.00	.26
Econtenure	1.77	1.83	3.00	1.00	.43
Psychtenure	1.24	1.00	2.75	1.00	.37

Table 9
Estimating the Effect of the Psychological and Economic Measures on *TenureChoice* (number of observations = 308)

Variable	Coefficient	z-Statistic	Probability
Intercept	−8.92	−6.26	.0000
EconTenure	1.56	2.40	.0164
PsychTenure	2.37	4.25	.0000
McFadden R^2	.24		

ENVIRONMENT AND BEHAVIOR ✕

Journal Impact Factor ™

2021	Five Year
6.548	**7.124**

JCR Category	Category Rank	Category Quartile
ENVIRONMENTAL STUDIES in SSCI edition	21/127	Q1
PSYCHOLOGY, MULTIDISCIPLINARY in SSCI edition	17/147	Q1

What's the benefit of being a homeowner?

- Get married before 30, and find a taller wife: Fang, L. and C. H. Tian (2018). "Housing and marital matching: A signaling perspective." *China Economic Review* 47: 27-46.

  - A field survey that was conducted in June and July 2011, in 54 rural villages of Zhejiang, Hubei and Shaanxi Provinces.

  - Sample size = 1134.

  - Housing size is reflective of males' unobservable characteristics. Males with more social connections, higher income rank and greater wealth build larger houses

  - A ten- square-meter larger house reduces a male's probability of singlehood by 0.8% at the age of 30, and enables him to marry a wife 0.1cm taller

Variable	Mean	Min	Max	Deviation	Observations
Households with males marrying within 20 years:					
Housing size	195.23	20.00	840.00	100.53	584
(square meters)					
Cadre	0.12	0.00	1.00	0.32	588
(whether a household member serves as a village-level or upper level cadre, yes = 1)					
Network	16.98	0.00	88.24	12.44	583
(the share of household expenditure spent on building and maintaining social network, %)					
Income rank	2.96	1	5	0.94	580
(household income rank in village, 1 = high, 2 = median-high, 3 = median, 4 = median-low, 5 = low)					
Exp	4.42	0.61	34.51	3.74	584
(household expenditure, 10,000 yuan)					
Edu	9.55	0.00	16.00	2.42	582
(years of formal education of marriageable males/females)					
Homestead size	47.13	2.00	333.33	37.90	585
(square meters)					
Family size	4.83	2.00	14.00	1.37	588
Adult	70.21	0.00	100.00	22.30	570
(the % of 18–60 year-olds in the family)					
Child	18.55	0.00	100.00	16.48	570
(the % of under 18 year- olds in the family)					
Homestead tenure	0.28	0.00	1.00	0.45	580
(whether the household head believes the household owns the homestead)					
Housing age	15.48	0.00	91.00	10.80	567
Hubei	0.41	0.00	1.00	0.49	588
(Hubei = 1)					
Shaanxi	0.43	0.00	1.00	0.50	588
(Shaanxi = 1)					
Households with females marrying within 20 years:					
Housing size	227.62	60.00	420.00	100.54	29
Cadre	0.07	0.00	1.00	0.26	29
Network	13.08	1.25	33.78	8.62	29
Income rank	2.76	1	5	0.94	21
Exp	5.75	1.45	24.50	5.26	29
Edu	11.72	5.00	18.00	3.42	29
Homestead size	175.31	50.00	360.00	61.84	29
Family size	4.03	3.00	7.00	1.21	29
Adult	78.64	33.33	100.00	18.43	29
Child	11.30	0.00	33.33	12.86	29
Homestead tenure	0.64	0.00	1.00	0.45	28
Housing age	14.72	0.00	42.00	9.96	29
Hubei	0.69	0.00	1.00	0.47	29
Shaanxi	0.14	0.00	1.00	0.35	29
Males 30–45 years old:					
Marriage	0.81	0.00	1.00	0.39	180
(married = 1)					
Housing size	196.33	30.00	840.00	118.55	175
Age	36.39	30.00	45.00	4.92	180
Edu	9.50	0.00	16.00	2.44	178
Cadre	0.15	0.00	1.00	0.36	180
Homestead size	51.14	2.00	340.00	50.136	176
Homestead tenure	0.63	0.00	1.00	0.48	175
Housing age	19.45	0.00	77.00	11.30	168
Hubei	0.27	0.00	1.00	0.44	180
Shaanxi	0.28	0.00	1.00	0.45	180
Females 28–43 years old:					
Marriage	0.33	0.00	1.00	0.48	33
Housing size	225.00	60.00	400.00	98.47	33
Age	33.48	28.00	43.00	4.68	33
Edu	7.78	0.00	16.00	3.65	32
Cadre	0.12	0.00	1.00	0.33	33
Homestead size	93.72	9.09	250.00	79.05	33
Homestead tenure	0.57	0.00	1.00	0.50	30
Housing age	15.42	0.00	39.00	10.51	33
Hubei	0.55	0.00	1.00	0.51	33
Shaanxi	0.37	0.00	1.00	0.45	33

Variable	Mean	Min	Max	Deviation	Observations
Married males:					
Housing size	194.87	30.00	840.00	96.07	379
Age	33.40	20.00	57.00	6.34	381
Height	169.50	110.00	185.00	6.57	378
Edu	9.76	0.00	16.00	2.37	374
Cadre	0.12	0.00	1.00	0.33	381
Homestead size	220.89	10.00	900.00	160.47	376
Homestead tenure	0.62	0.00	1.00	0.49	379
Housing age	20.48	2.00	91.00	10.14	381
Hubei	0.39	0.00	1.00	0.49	381
Shaanxi	0.37	0.00	1.00	0.48	381
Married couples:					
Height_W	162.02	100.00	185.00	6.45	365
(wife's height, cm)					
Edu_W	9.31	0.00	16.00	2.80	366
(wife's years of education before marriage)					
Housing size	187.36	30.00	840.00	97.647	367
Age_W	31.71	18.00	55.00	6.44	371
(wife's age)					
Age_H	33.63	22.00	55.00	6.62	368
(husband's age)					
Height_H	169.49	110.00	185.00	6.63	368
(husband's height)					
Edu_H	9.77	0.00	16.00	2.40	365
(husband's education before marriage)					
Cadre	0.12	0.00	1.00	0.32	371
Homestead size	232.67	10.00	1350.00	187.65	368
Homestead tenure	0.60	0.00	1.00	0.49	367
Housing age	20.37	2.00	91.00	10.50	349
Hubei	0.37	0.00	1.00	0.48	371
Shaanxi	0.40	0.00	1.00	0.49	371

Males' qualities and housing size.

	(3)
Network	0.928**
Income rank	− 9.381*
Exp	2.570*
Cadre	− 0.546
Edu	− 1.217
Homestead size	0.371*
Family size	9.040**
Adult	− 0.231
Child	− 0.202
Homestead tenure	4.302
Housing age	− 2.574***
Hubei	− 72.171***
Shaanxi	− 117.148***
R^2	0.304
F	16.60
Probability > F	0.0000
Number of observations	526

Females' qualities and housing size.

	(3)
Network	− 1.773
Income rank	− 57.000
Exp	− 7.087
Cadre	− 13.138
Edu	14.681
Homestead size	− 0.197
Family size	29.127
Adult	2.712
Child	6.906
Homestead tenure	69.696
Housing age	− 0.883
Hubei	− 95.653
Shaanxi	− 37.254
R^2	0.817
F	23.16
Probability > F	0.0000
Number of observations	20

Housing signal and wife's qualities.

	Height_W		Edu_W	
	(1)		(2)	
Housing size	0.010*	(0.005)	0.0003	(0.001)
Age_W	0.134	(0.090)	− 0.030	(0.031)
Age_H	− 0.204*	(0.088)	− 0.049	(0.031)
Height_H	− 0.032	(0.056)	0.010	(0.020)
Edu_H	0.297*	(0.168)	0.570***	(0.058)
Cadre	0.911	(1.175)	0.402	(0.410)
Homestead size	0.001	(0.002)	0.001	(0.0008)
Homestead tenure	1.206	(0.743)	0.148	(0.259)
Housing age	0.055	(0.041)	0.005	(0.014)
Hubei	1.220	(1.043)	− 0.920*	(0.364)
Shaanxi	2.153*	(1.241)	− 0.876*	(0.433)
R^2	0.075		0.369	
F	2.330		16.923	
Probability > F	0.0091		0.0000	
Breusch-Pagan test of independence	$chi^2 = 8.887$		Pr = 0.0029	
Number of observations	330		330	

What are the hurdles to homeownership?

- Three hurdles: wealth, income, and credit constraints

- Only 31% of adults believes that their retirement savings is sufficient, and 28% of the interviewed individuals have no savings for retirement or pension. 37% of the adults cannot cover an unexpected expense of $400 (Economic Well-Being of U.S. Households in 2022. US Federal Reserve).

Table 36. Have retirement savings and view retirement savings plan as on track (by age, race/ethnicity, and disability status)
Percent

Characteristic	Any retire-ment savings	Retirement savings on track
Age		
18–29	57	24
30–44	72	32
45–59	81	34
60+	88	41
Race/ethnicity		
White	80	37
Black	60	22
Hispanic	56	20
Asian	84	38
Disability status		
No disability	76	34
Disability	47	13
Overall	**72**	**31**

Note: Among non-retirees.

Figure 19. Would cover a $400 emergency expense completely using cash or its equivalent (by year)

Percent

Year	Value
2013	50
2014	53
2015	54
2016	56
2017	59
2018	61
2019	63
2020	64
2021	68
2022	63
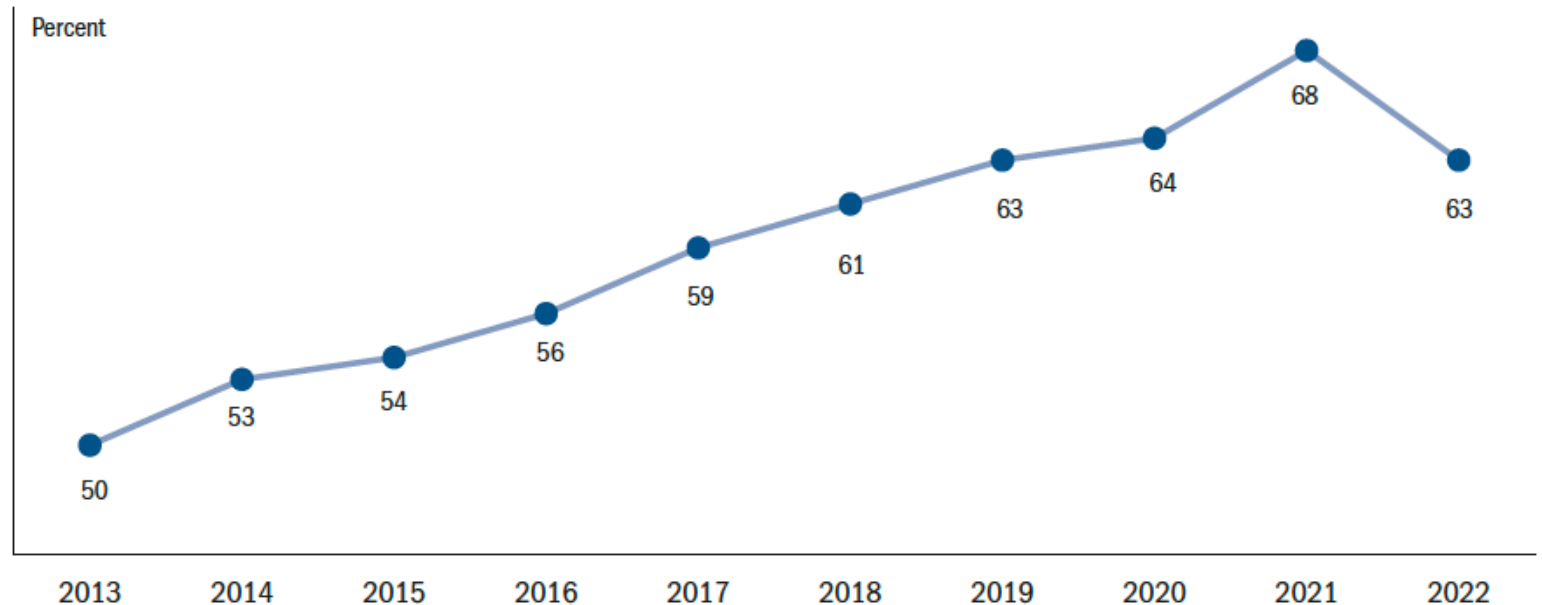
Note: Among all adults.

What are the hurdles to homeownership?

- Garcia, J. M. and J. Vila (2020). "Financial literacy is not enough: The role of nudging toward adequate long-term saving behavior." *Journal of Business Research* 112: 472-477.
  - A field experiment with employees of a leading life and pensions company in Spain
  - Sample size: 282 in 2016 and 405 in 2017
  - The *Ahorra+* program: A pension management system that automatically enroll members and increase the rate of contribution by 10% every year.
  - Within-group experiment design, because the program cannot be randomly applied to a subset of employees due to legal and managerial issues
  - Two measurements: dropout (voluntary decision to continue with or withdraw from the program) and amount of voluntary annual contribution to the pension plan
  - Conclusion: adequate behavioral interventions improve actual financial behavior even when applied to experts and professionals in the financial sector

Table 2

Participant data by salary group, gender, and age (2017 *Ahorra+* program).

	Ahorra+ participants since 2016				*Participants joining Ahorra+ in 2017*			
	No. employees	Mean contribution 2016	Mean contribution 2017	Increase	No. new employees	Mean contribution 2016	Mean contribution 2017	Increase
All employees	240	€1994	€2374	19.1%	95	€1252	€1645	31.4%
Low salary	36	€1223	€1446	18.2%	11	€927	€1269	36.9%
Lower-intermediate salary	134	€1403	€1622	15.6%	22	€1091	€1331	22.1%
Upper-intermediate salary	60	€1821	€2110	15.9%	32	€1223	€1608	31.5%
High salary	10	€2554	€3178	24.4%	30	€1628	€2053	26.1%
Men	93	€2148	€2775	29.2%	41	€1224	€1726	41.0%
Women	147	€1726	€2133	23.6%	54	€1273	€1584	24.5%
Less than 35 years	39	€1360	€1622	19.3%	15	€756	€1524	10.7%
From 36 to 45 years	51	€1692	€2231	31.9%	46	€1165	€1538	32.0%
From 46 to 55 years	67	€2348	€2808	19.6%	28	€1641	€1837	11.9%
More than 55 years	83	€3564	€3284	−7.9%	6	€1821	€1875	3.0%

Notes: The mean contribution comprises company and employee contributions (both mandatory and voluntary). Most of the increase corresponds to employees' voluntary contributions, consisting of those by the company and employees' obligation of an average increase of 2%.

What behavioural insights can be applied to improve homeownership?

- Human being are farsighted planners and myopic doers at the same time (Thaler and Shefrin, 1981): short-sighted and lack of self-control

- Nudges: behavioural interventions that help us to align intention and action

- Default options and mental accounting

The power of default

- Uses 'system 1' instead of 'system 2' – doing without thinking

- Saves mental power – does not require self-control

- Still free will – libertarian paternalism

- Example:
  - SMarT in the US (saving rate increased from 3.5% to 13.6%, Thaler and Benartzi, 2004)
  - Pension scheme in the UK (changing the default option from 'opt-in' to 'opt-out', Behavioural Insight Team)

Save More for Tomorrow (SMarT)

- Thaler, R. H. and S. Benartzi (2004). "Save More Tomorrow™: Using behavioral economics to increase employee saving." *Journal of Political Economy* 112(1): S164-S187.
  - Field observations (close to randomized controlled trails. A field experiment).
  - Treatment: Save More for Tomorrow, a program to help employees who would like to save more but lack the willpower to act on this desire
  - Experiment setting:
    - The First Implementation of SMarT: Midsize Manufacturing Company in 1998
    - The second implementation of the program took place in May 2001 at Ispat Inland, a large midwestern steel company
    - The third implementation of SMarT took place at two divisions (Divisions A and O) of Philips Electronics in January 2002, with the first saving increase taking place on April 1, 2002. The remaining 28 divisions of Philips served as a control.

Save More for Tomorrow (SMarT)

- Thaler, R. H. and S. Benartzi (2004). "Save More Tomorrow™: Using behavioral economics to increase employee saving." *Journal of Political Economy* 112(1): S164-S187.

Component	Description	Psychological Factor
1	Employees are approached about increasing their contribution rates a considerable time before their scheduled pay increase	Hyperbolic discounting
2	If employees join, their contribution to the plan is increased beginning with the first paycheck after a raise	Loss aversion (perceived) Mental accounting
3	The contribution rate continues to increase on each scheduled raise until the contribution rate reaches a preset maximum	Inertia and status quo bias
4	The employee can opt out of the plan at any time	Peace of mind

Save More for Tomorrow (SMarT)

- Thaler, R. H. and S. Benartzi (2004). "Save More Tomorrow™: Using behavioral economics to increase employee saving." *Journal of Political Economy* 112(1): S164-S187.

AVERAGE SAVING RATES (%) FOR THE FIRST IMPLEMENTATION OF SMarT

	Participants Who Did Not Contact the Financial Consultant	Participants Who Accepted the Consultant's Recommended Saving Rate	Participants Who Joined the SMarT Plan	Participants Who Declined the SMarT Plan	All
Participants initially choosing each option*	29	79	162	45	315
Pre-advice	6.6	4.4	3.5	6.1	4.4
First pay raise	6.5	9.1	6.5	6.3	7.1
Second pay raise	6.8	8.9	9.4	6.2	8.6
Third pay raise	6.6	8.7	11.6	6.1	9.8
Fourth pay raise	6.2	8.8	13.6	5.9	10.6

* There is attrition from each group over time. The number of employees who remain by the time of the fourth pay raise is 229.

Save More for Tomorrow (SMarT)

- Thaler, R. H. and S. Benartzi (2004). "Save More Tomorrow™: Using behavioral economics to increase employee saving." *Journal of Political Economy* 112(1): S164-S187.

Average Saving Rates for Ispat Inland (%)

	Employees Who Were Already Saving on May 31, 2001		Employees Who Were Not Saving on May 31, 2001		All Eligible Employees
	Joined SMarT ($N=615$)	Did Not Join SMarT ($N=3,197$)	Joined SMarT ($N=165$)	Did Not Join SMarT ($N=1,840$)	($N=5,817$)
Pre-SMarT (May 2001)	7.62	8.62	.00	.00	5.54
First pay raise (October 2001)	9.38	8.54	2.28	.26	5.83

Note.—The sample includes 5,817 employees who are eligible to participate in the 401(k) plan and have remained with the company from May 2001 through October 2001. The sample includes 414 employees who were already saving at the maximum rate of 18 percent, although they were not allowed to join the SMarT program. The reported saving rates represent the equally weighted average of the individual saving rates.

Save More for Tomorrow (SMarT)

- Thaler, R. H. and S. Benartzi (2004). "Save More Tomorrow™: Using behavioral economics to increase employee saving." *Journal of Political Economy* 112(1): S164-S187.

AVERAGE SAVING RATES (%) FOR PHILIPS ELECTRONICS

| | EMPLOYEES WHO WERE ALREADY SAVING IN DECEMBER 2001 | | EMPLOYEES WHO WERE NOT SAVING IN DECEMBER 2001 | | |
| | Joined SMarT | Did Not Join SMarT | Joined SMarT | Did Not Join SMarT | ALL EMPLOYEES |
DATE					
A. Control Group					
Observations		7,405		7,053	14,458
Pre-SMarT (December 2001)		5.65		.00	2.90
Post-SMarT (March 2002)		5.76		.70	3.29
B. Test Group (Divisions A and O Combined)					
Observations	180	339	36	260	815
Pre-SMarT (December 2001)	5.26	5.38	.00	.00	3.40
Post-SMarT (March 2002)	6.83	5.72	5.03	1.55	4.61
C. Division A					
Observations	66	190	10	163	449
Pre-SMarT (December 2001)	5.47	5.48	.00	.00	3.12
Post-SMarT (March 2002)	7.32	5.97	6.80	1.54	4.38
D. Division O					
Observations	114	149	26	77	366
Pre-SMarT (December 2001)	5.14	5.25	.00	.00	3.74
Post-SMarT (March 2002)	6.55	5.41	4.35	1.58	4.89

NOTE.—The "test" group consists of individuals at Divisions A and O.

PARTICIPATION RATES IN THE SMarT PROGRAM AT PHILIPS ELECTRONICS

Explanatory Variable	Total Number of Employees	Number of Employees in the Test Group	Number of Employees Joining SMarT	SMarT Participation Rate (%)
Entire sample	15,273	815	216	26.5
Saving rate (prior to SMarT):				
0%	7,351	296	36	12.2
1–5%	1,914	162	62	38.2
6%	4,931	304	101	33.2
7–9%	1,079	53	17	32.1
Division:				
A	449	449	76	16.9
Control	14,458	0	0	
O	366	366	140	38.3
Participated in education seminar:				
No	389	389	20	5.6
Yes	426	426	196	46.0
Met with financial advisor:				
No	213	213	16	7.5
Yes	153	153	124	81.0
Registered Web user:				
No	12,161	663	162	24.4
Yes	3,112	152	54	35.5

NOTE.—The initial sample included 46,873 individual-year observations (excluding highly compensated employees). We first required that all the individuals be present before and after the implementation of the SMarT program, which reduced the number to 20,122 individuals. Next, we eliminated those who switched between the test and control groups, leaving us rate with 20,103 individuals. We also eliminated those saving more than 10 percent of their pay because they were not allowed to join SMarT, resulting in 15,274 individuals. Of the remaining 15,274 individuals, most are in the "control" group, and they were not offered the SMarT program. The "test" group consists of individuals at the A and O Divisions.

Automatic Enrolment Pension Scheme

- Department for Work and Pensions (2020). Workplace pensions participation and savings trends: 2009 to 2019.
  - The first nation-wide implementation of automatic enrolment pension scheme in the world
  - Based on experimental findings by the Behavioural Insight Team in the UK
  - Heavily influenced by 'Nudges' and Thalers' SMarT programme
  - Rolled out in phases since 2012, and more than 10 million employees have participated.
  - Data source: Annual Survey of Hours and Earnings (ASHE)
    - Published by the Office for National Statistics (ONS) and is a key source of information on workplace pensions in GB as it collects information on all types of workplace pension.
    - Based on a 1% sample of employee jobs taken from HM Revenue & Customs (HMRC) PAYE (Pay As You Earn) records. Information is obtained from employers and treated confidentially.

THE
**BEHAVIOURAL
INSIGHTS
TEAM**

- Set up by the Prime Minister David Cameron in 2010 as the first government institution with a mandate to apply behavioural insights and empirical methods to public policy
- Spined out of the government at the beginning of 2014
- Also known as the 'Nudge Unit'
- It is now jointly owned by the UK Cabinet Office, innovation charity Nesta and their employees
- It has run more than 750 projects to date, including 400 randomised controlled trials in dozens of countries
- Offices in seven cities: London, Manchester, Paris, New York, Sydney, Singapore, Toronto, and Wellington

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Organ Donation

- Working with NHS Blood and Transplant, Government Digital Services, the Department of Health and DVLA to increase the number of people on the NHS Organ Donor Register.

- They used the point at when people had just completed registering for a driving licence or renewing their vehicle tax to trial 8 different prompts on over 1 million people.

- The results show that it is likely to lead to around 100,000 additional registrations in a year.

Percentage of People Registering as Organ Donors, by Variant
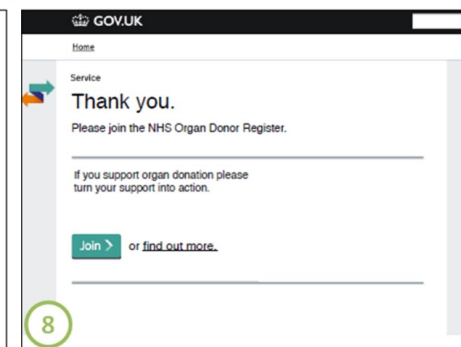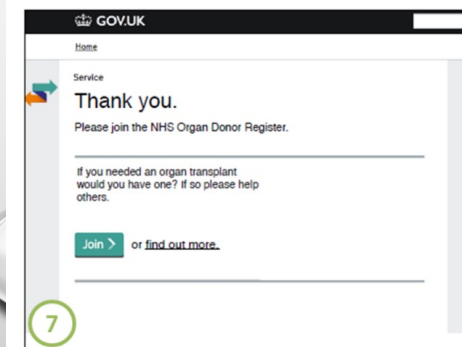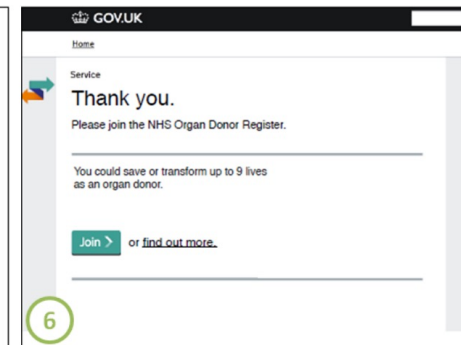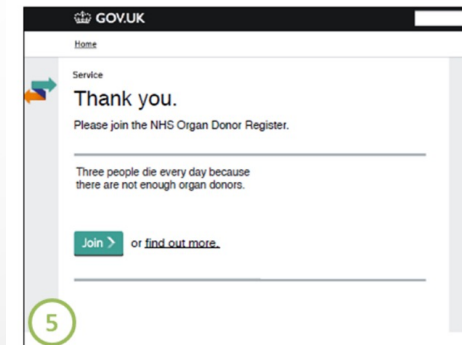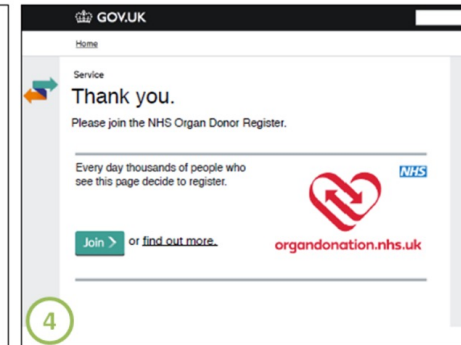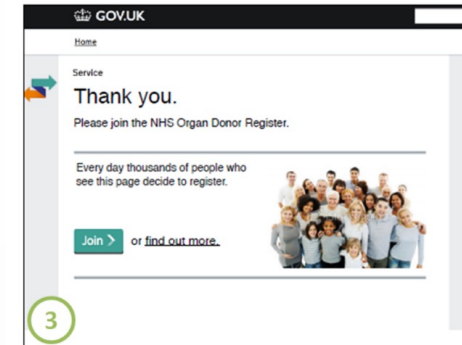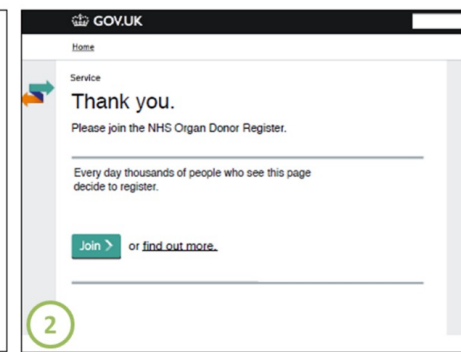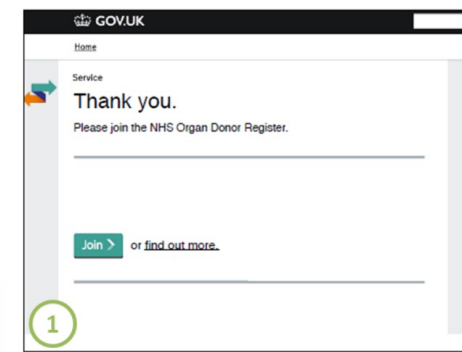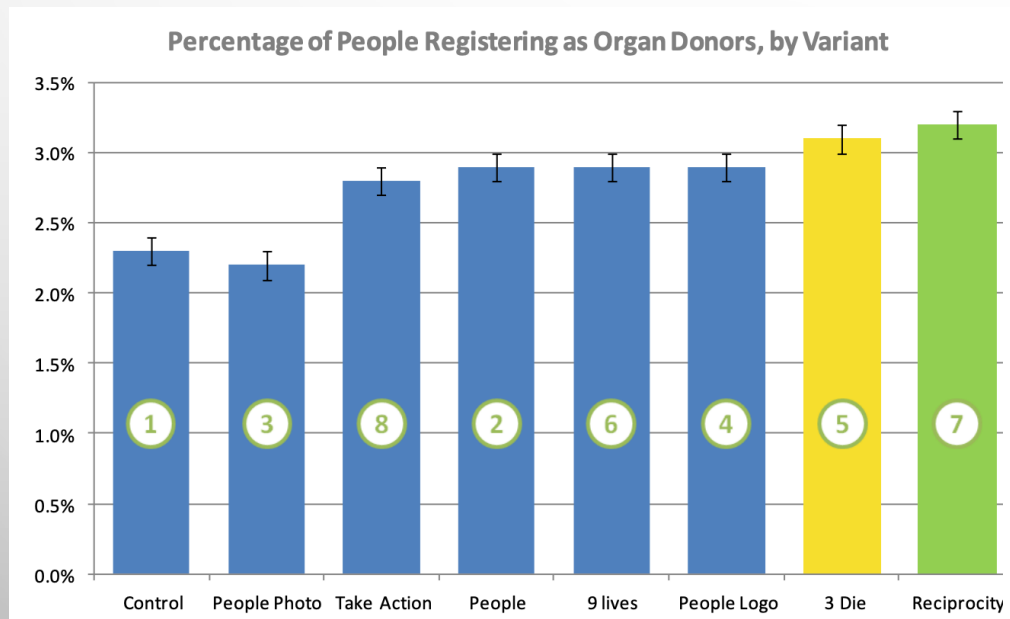
Fighting Unemployment

- Working with Job Centre Plus in Loughton, Essex, to help get people back into work..

- A six-month randomised controlled trial

- Tested the difference between the existing process and three new changes.

- job seekers in the treatment group are 15-20% more likely than those in the control group to be off benefits 13 weeks after signing on

- The changes were as follows:

1. Making sure every customer talks about getting back to work on their first day (not after 2 weeks) by cutting down and reorganising processes
2. Introducing stretching commitment devices which focus on what the job seeker **will do** for the whole of the next fortnight. This replaces the present system where advisors ask if job seekers **have done** three job search activities in each of the previous two weeks
3. Building psychological resilience and wellbeing for those who are still claiming after 8 weeks through 'expressive writing' and strengths identification.
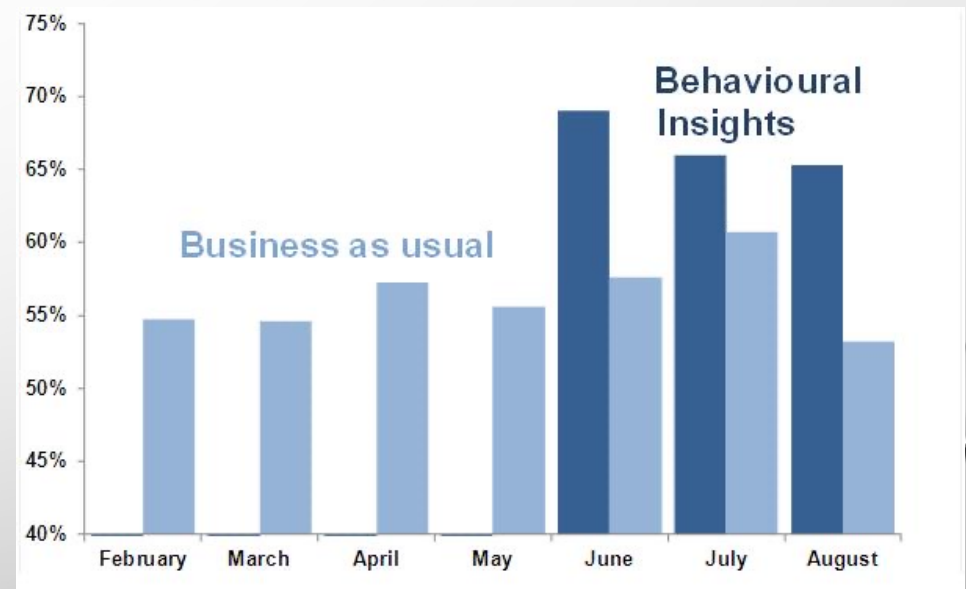
Automatic Enrolment Pension Scheme

- Department for Work and Pensions (2022). Workplace pensions participation and savings trends: 2009 to 2021.
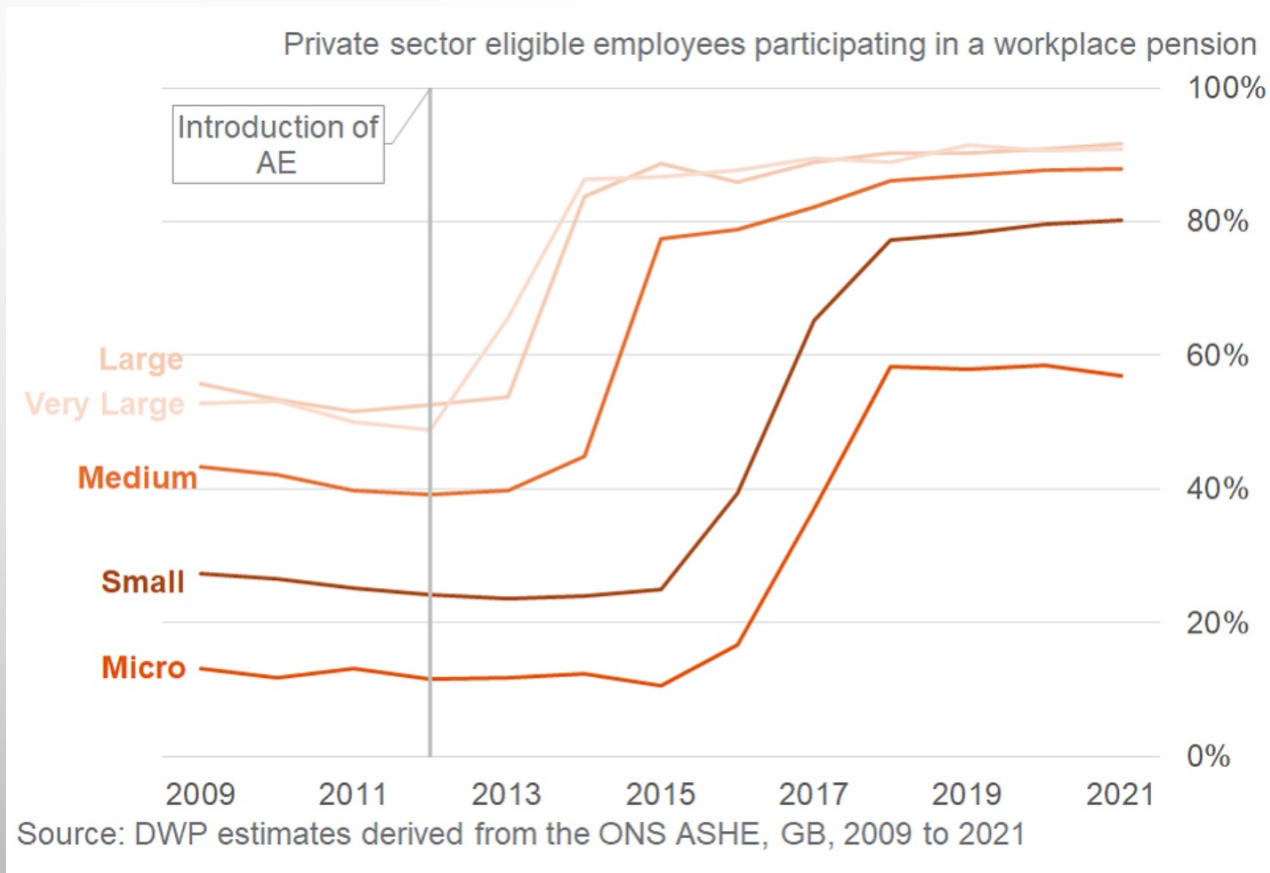
Figure 1: Eligible employee participation rate to 2021

Eligible employees participating in a workplace pension
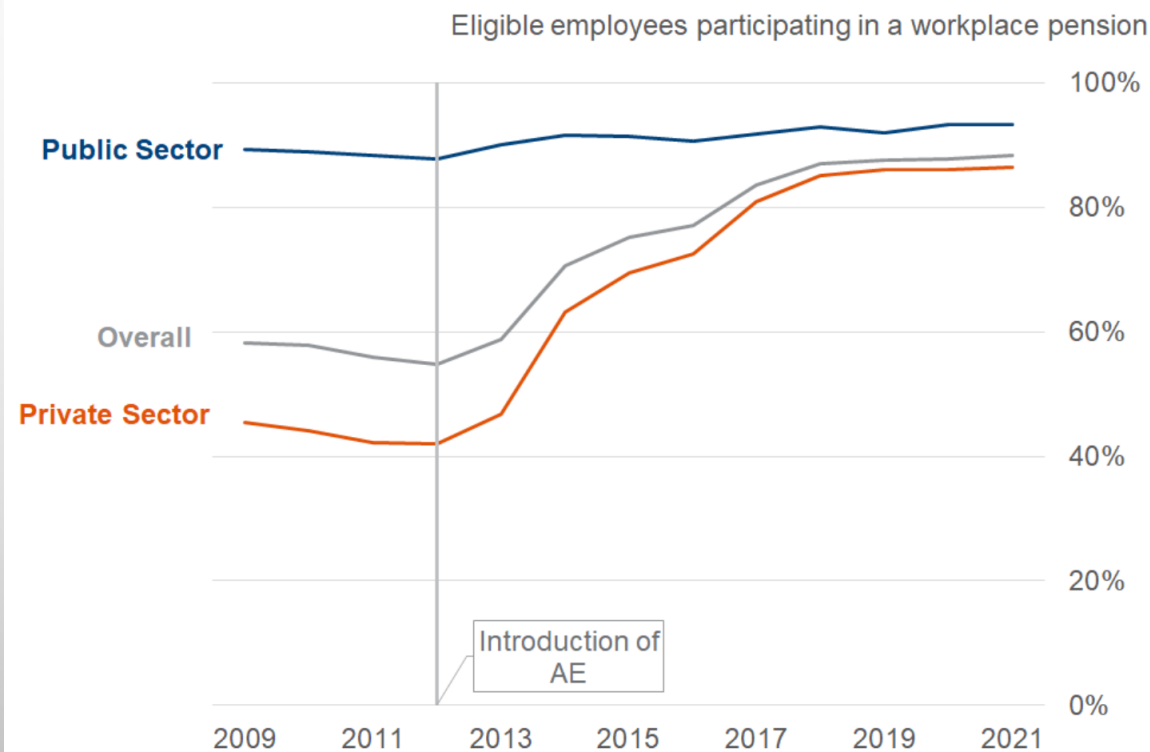
- Trends across all breakdowns broadly reflect this overall picture of participation in the public and private sector
- Since 2012, many gaps in participation have narrowed – the largest increases have been seen in Agriculture & Fishing and Distribution, Hotels & Restaurants industries and among small private employers (5 to 49 employees)
- Most groups have seen trends in participation stabilise between 2018 and 2021
- There are some gaps that remain in 2021 and there is relatively low participation of below 65% for some eligible groups including micro employers and around 66% for Pakistani and Bangladeshi employees (ethnicity is calculated using a 3-year average)
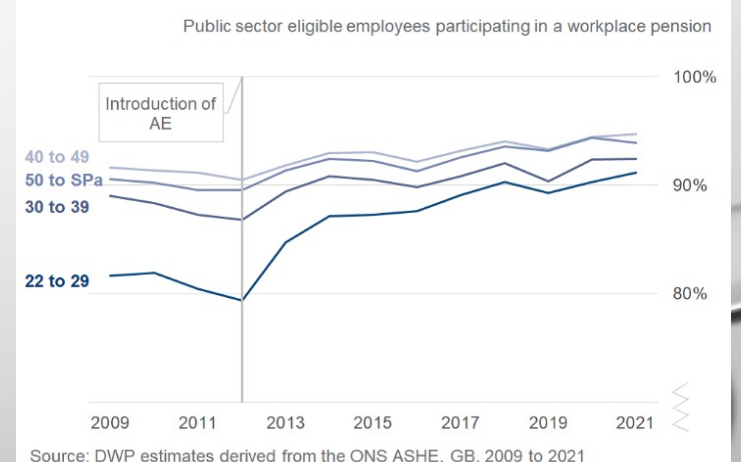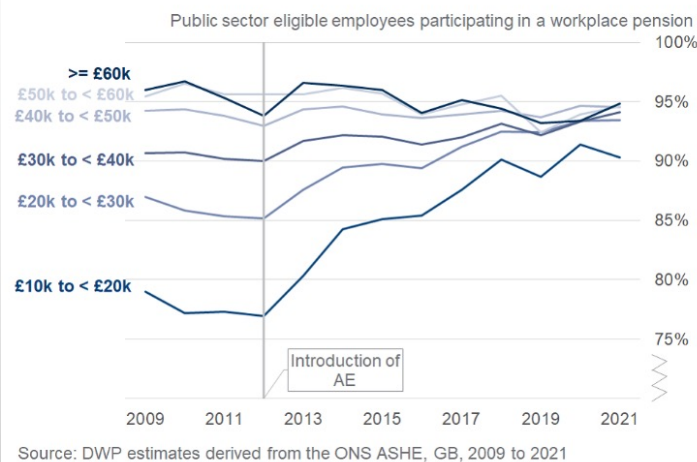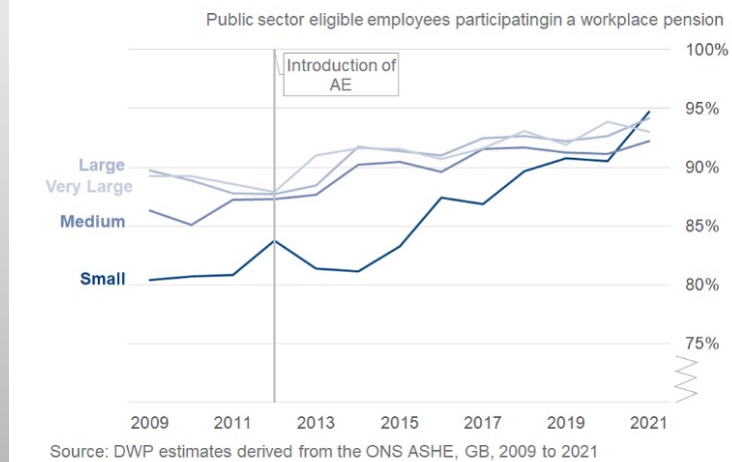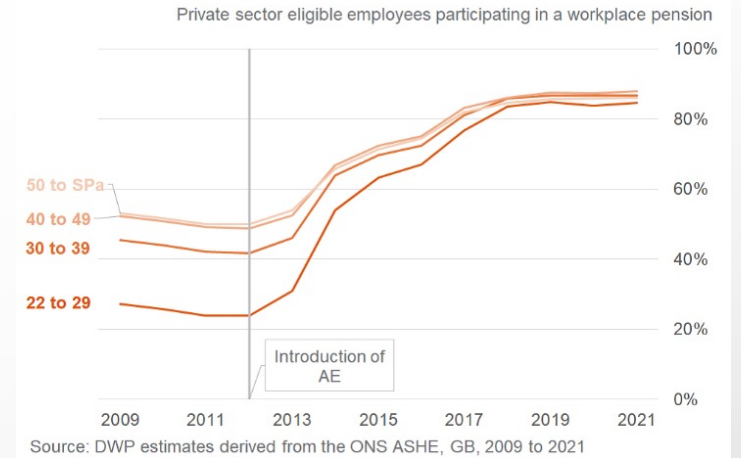
Automatic Enrolment Pension Scheme

- Department for Work and Pensions (2022). Workplace pensions participation and savings trends: 2009 to 2021.

Private sector eligible employees participating in a workplace pension

Source: DWP estimates derived from the ONS ASHE, GB, 2009 to 2021

- All employer sizes have seen large increases in eligible employee participation rates since the start of the relevant automatic enrolment staging date.
- The highest levels of both private and public sector participation in 2021 were seen in the larger employer bands
- Participation rates among micro (1 to 4 employees) and small (5 to 49 employees) employers in the private sector have increased since 2012 to their current position of 57% and 80%.
- There is a persistent gap in participation rates of these groups and other sized employers.

Automatic Enrolment Pension Scheme

- Department for Work and Pensions (2022). Workplace pensions participation and savings trends: 2009 to 2021.
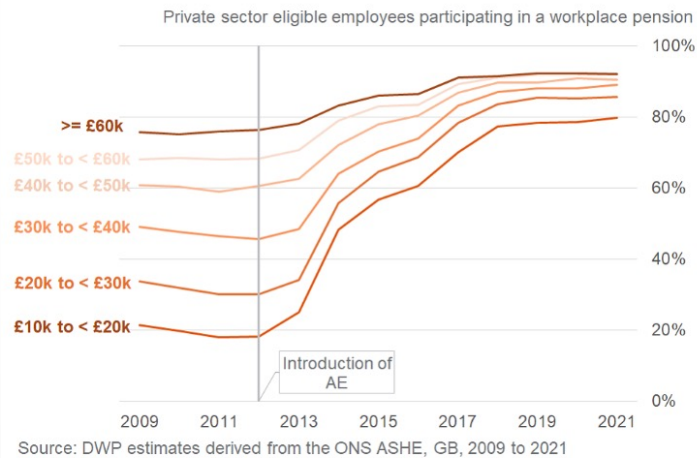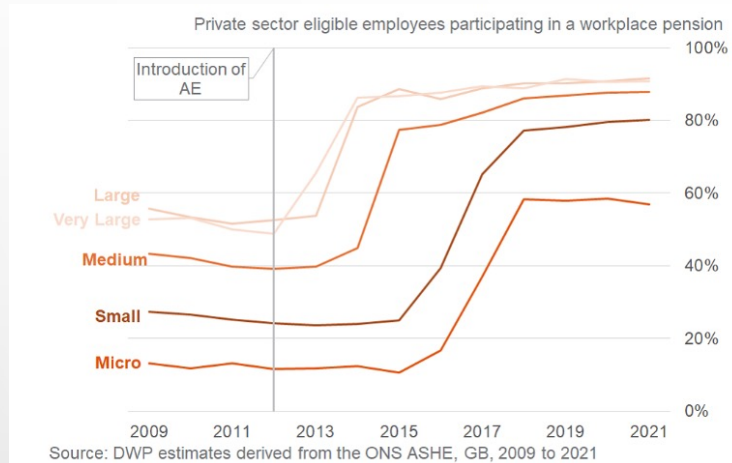
Automatic Enrolment Pension Scheme

- Cribb, J. and C. Emmerson (2020). "What happens to workplace pension saving when employers are obliged to enrol employees automatically?" *International Tax and Public Finance* 27(3): 664-693.

  - Data source: Annual Survey of Hours and Earnings (ASHE), 1997 – 2015

  - Linear probability model and Probit model

  - Private sector only

  - Employers with five or more employees only

  - Sample size: 457,443 records and 64,849 employers.

Automatic Enrolment Pension Scheme

- Cribb, J. and C. Emmerson (2020). "What happens to workplace pension saving when employers are obliged to enrol employees automatically?" *International Tax and Public Finance* 27(3): 664-693.

$$y_{ift} = \alpha + \beta(\text{autoenrol})_{ift} + \sum_{a=2013}^{2015} \gamma_a \left[\text{partial\_}a = 1\right] + \theta_f + \mu_t + \delta X_{ift} + \varepsilon_{ift}.$$

- Dependent variable: 1) a dummy indicating whether the employee is participating in a workplace pension, and 2) contribution rates (both mean and whether below different thresholds)

- *Autoenrol*: = 1 if automatic enrolment is in place in the employee's employer when they are observed, and 0 otherwise

- Partial_a = 1: a dummy variable for being 'partially affected', which varies for each year that there are people who are partially affected (2013–2015)

- X: control variables including sex, age (in cubic), job tenure (three dummies), dummies for working for a non-profit institution, being in a full-time job, the job not being the individual's 'main' job and the job being temporary, 10 regional dummies, 12 dummies for industry of the employer and 8 dummies for occupational category of the employee. [29]

Automatic Enrolment Pension Scheme

- Cribb, J. and C. Emmerson (2020). "What happens to workplace pension saving when employers are obliged to enrol employees automatically?" _International Tax and Public Finance_ 27(3): 664-693.

Table 3 Effect of automatic enrolment on pension participation rates of targeted private sector employees. _Source_: Authors' calculations using the Annual Survey of Hours and Earnings

	(1)	(2)	(3)	(4)
Effect of automatic enrolment	0.365***	0.361***	0.376***	0.368***
Standard error	[0.016]	[0.016]	[0.018]	[0.017]
Number of observations	457,443	457,443	457,443	457,443
Number of clusters	64,849	64,849	64,849	64,849
Estimated by:	OLS	OLS	Probit	Probit
Control variables (X) included?	No	Yes	No	Yes

*** Denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level and * at the 10% level. Probit models are estimated using maximum likelihood. Standard errors are clustered at the employer level and for specifications 3 and 4 are estimated by bootstrapping the average marginal effect of automatic enrolment on pension participation 250 times. Control variables (X) are listed in Appendix Table 11. Sample includes all targeted private sector employees from April 2011 to April 2015

Table 4 Effect of automatic enrolment on pension participation rates of different subgroups. *Source*: Authors' calculations using the Annual Survey of Hours and Earnings

	Effect	Std error	Sample size	Number of clusters	Participation rate in 2012 (%)	Participation rate in 2015 (%)
All	0.361***	[0.016]	457,443	64,849	48.6	88.1
Age group						
22–29	0.521***	[0.023]	94,294	24,329	27.6	85.4
30–39	0.372***	[0.017]	116,337	25,480	48.0	88.4
40–49	0.306***	[0.016]	124,806	25,370	56.4	89.9
50 to state pension age	0.279***	[0.013]	122,006	23,570	57.7	88.0
Job tenure (years with employer)						
< 1 year	0.538***	[0.013]	49,771	23,459	21.6	81.3
1–2 years	0.494***	[0.016]	54,653	25,773	30.0	86.1
2–5 years	0.444***	[0.019]	109,154	30,377	38.2	87.3
≥ 5 years	0.266***	[0.016]	243,865	34,820	62.0	90.4
Earnings quartile						
Lowest quartile	0.539***	[0.035]	114,361	28,007	22.3	81.1
Second quartile	0.457***	[0.020]	114,361	28,805	36.0	86.1
Third quartile	0.315***	[0.013]	114,362	25,907	55.5	89.5
Fourth quartile	0.161***	[0.009]	114,359	19,071	76.6	93.5
Sex						
Male	0.356***	[0.016]	275,633	42,758	50.0	88.7
Female	0.369***	[0.018]	181,810	32,757	46.4	87.1
Industry's pension participation pre-reform						
Lowest third	0.619***	[0.011]	142,384	26,149	18.7	83.9
Middle third	0.375***	[0.038]	141,164	21,020	44.7	86.8
Highest third	0.151***	[0.010]	141,549	13,915	75.3	92.3

Table 11 Effect of automatic enrolment on workplace pension participation among targeted employees: OLS regression results. *Source*: Authors' calculations using the Annual Survey of Hours and Earnings
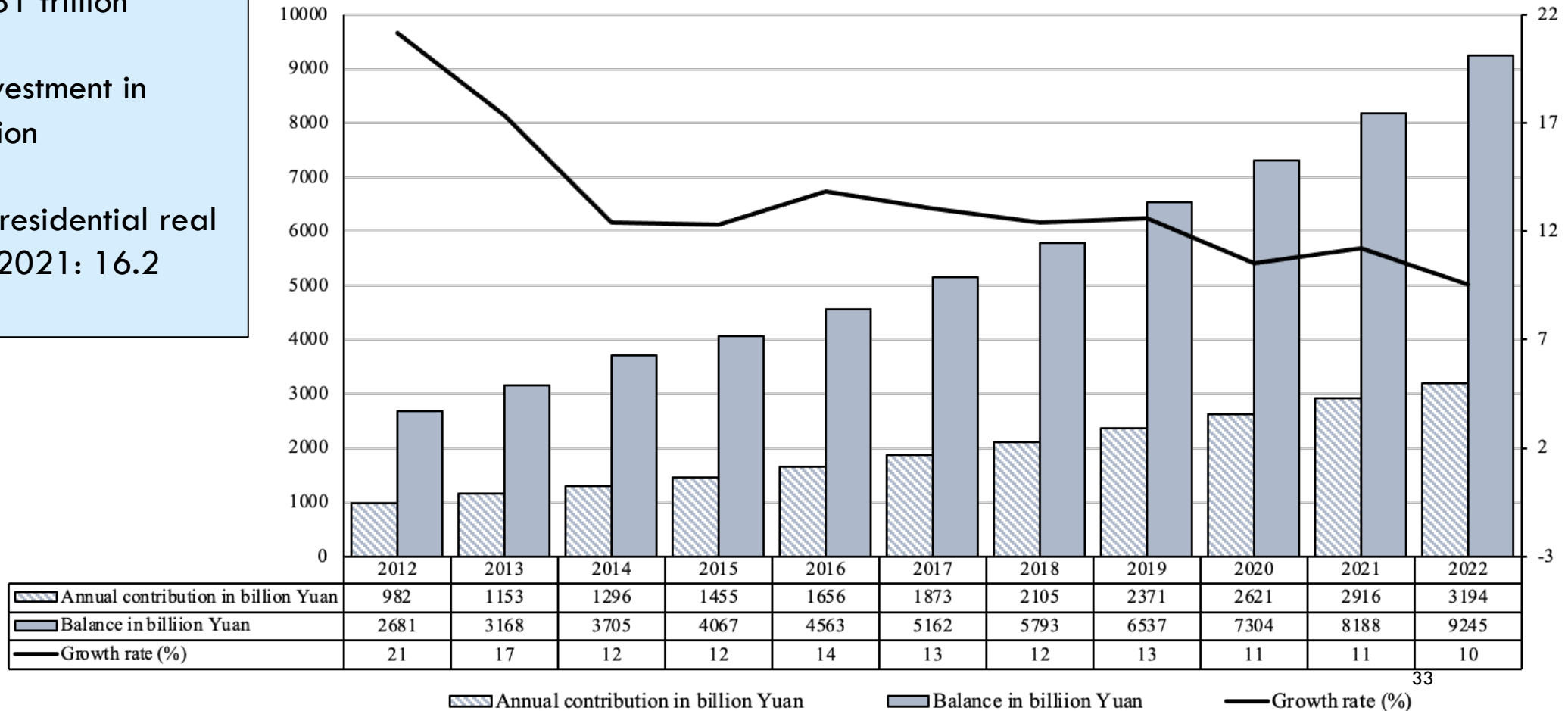
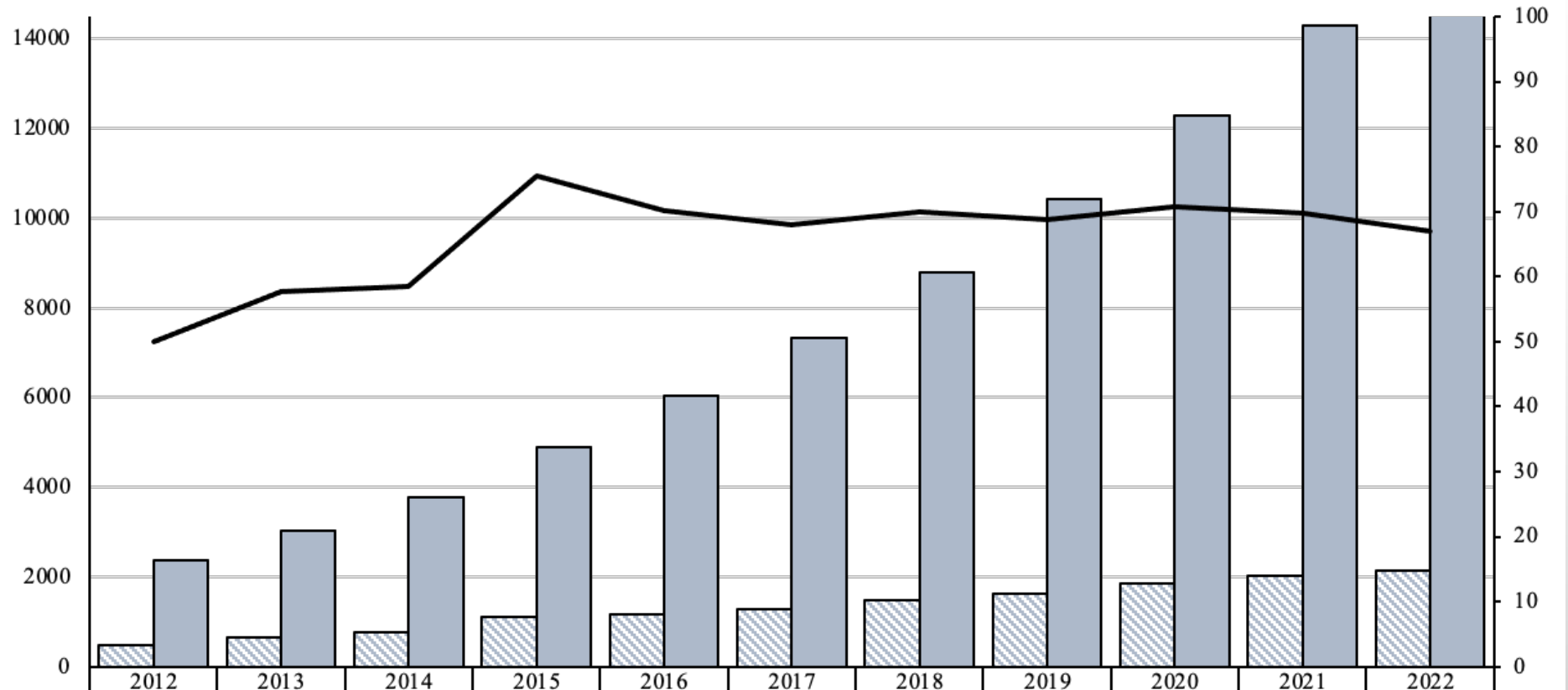| Independent variable	Effect	Standard error
Auto-enrolment (AE) in place	0.361***	[0.016]
AE partially introduced (2013)	0.067***	[0.020]
AE partially introduced (2014)	0.170***	[0.010]
AE partially introduced (2015)	0.204***	[0.015]
Year is 2012	−0.007**	[0.003]
Year is 2013	−0.004	[0.007]
Year is 2014	0.002	[0.005]
Year is 2015	0.032***	[0.006]
Employer size: 6000–29,999	−0.043	[0.043]
Employer size: 350–5999	−0.037	[0.042]
Employer size: 160–349	−0.075*	[0.043]
Employer size: 58–159	−0.137***	[0.043]
Employer size: 50–57	−0.200***	[0.045]
Employer size: 5–49	−0.280***	[0.044]
Male	0.009***	[0.003]
Age	−0.008	[0.005]
Age squared	0.000***	[0.000]
Age cubed	0.000***	[0.000]
Non-profit institution	0.091***	[0.008]
Full-time job	0.034***	[0.006]
Non-main job	−0.146***	[0.013]
Temporary job	−0.079***	[0.010]
North West	0.010	[0.009]
Yorkshire and the Humber	0.003	[0.010]
East Midlands	0.017*	[0.010]
West Midlands	0.008	[0.010]
South West	0.032***	[0.009]
East	0.034***	[0.009]
London	0.033***	[0.009]
South East	0.048***	[0.009]
Wales	0.024**	[0.012]
Scotland	0.040***	[0.009]
Industry: retail and wholesale	−0.134***	[0.013]
Industry: transport and storage	−0.035*	[0.019]
Industry: accommodation and food services	−0.206***	[0.012]
Industry: information and communications	−0.030**	[0.014]
Industry: finance and insurance	0.070***	[0.016]
Industry: mining, electricity and gas	0.103***	[0.021]
Industry: professional, science and technology	−0.029***	[0.010]
Industry: administrative and support	−0.167***	[0.014]
Industry: education	−0.028**	[0.011]
Industry: health	−0.113***	[0.013]
Industry: other services	−0.119***	[0.011]
Industry: other—not services	−0.110***	[0.009]
Occupational group: professionals	0.061***	[0.005]
Occupational group: associated professionals	0.012**	[0.005]
Occupational group: caring/leisure	−0.171***	[0.012]
Occupational group: sales/customer service	−0.115***	[0.008]
Occupational group: plant and machinery	−0.145***	[0.008]
Occupational group: elementary occupations	−0.143***	[0.008]
Job tenure: 1–2 years	0.036***	[0.003]
Job tenure: 2–5 years	0.072***	[0.003]
Job tenure: 5 years or more	0.181***	[0.004]
Constant	0.399***	[0.063]

Housing Provident Fund in China

- first introduced in Shanghai in 1991

- covered state-owned institutions and enterprises and joint venture between state-owned and private companies only

- modest contribution rate – 5% for both employees and employers

- offers mortgage loans with favourable terms and interest rates

- a national policy for all cities since 1994

- private companies and rural collective enterprises have been included since 1997

Annual and cumulative contributions to HPF (2012 – 2022)

- 2022 GDP: 181 trillion

- Real estate investment in 2022: 4.8 trillion

- Revenue from residential real estate sold in 2021: 16.2 trillion RMB

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Annual contribution in billion Yuan	982	1153	1296	1455	1656	1873	2105	2371	2621	2916	3194
Balance in billion Yuan	2681	3168	3705	4067	4563	5162	5793	6537	7304	8188	9245
Growth rate (%)	21	17	12	12	14	13	12	13	11	11	10

Annual contribution in billion Yuan   Balance in billion Yuan   Growth rate (%)

33

Annual and cumulative withdraw from HPF (2012 – 2022)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Annual withdrawal in billiion Yuan	491	665	758	1099	1163	1273	1474	1628	1855	2032	2136
Total withdrawal in billion Yuan	2359	3025	3781	4882	6046	7322	8796	10424	12279	14311	16447
Withdraw rate (%)	50	58	59	76	70	68	70	69	71	70	67

Annual withdrawal in billiion Yuan   Total withdrawal in billion Yuan   Withdraw rate (%)

Mortgage loan lending by HPF (2012 – 2021)
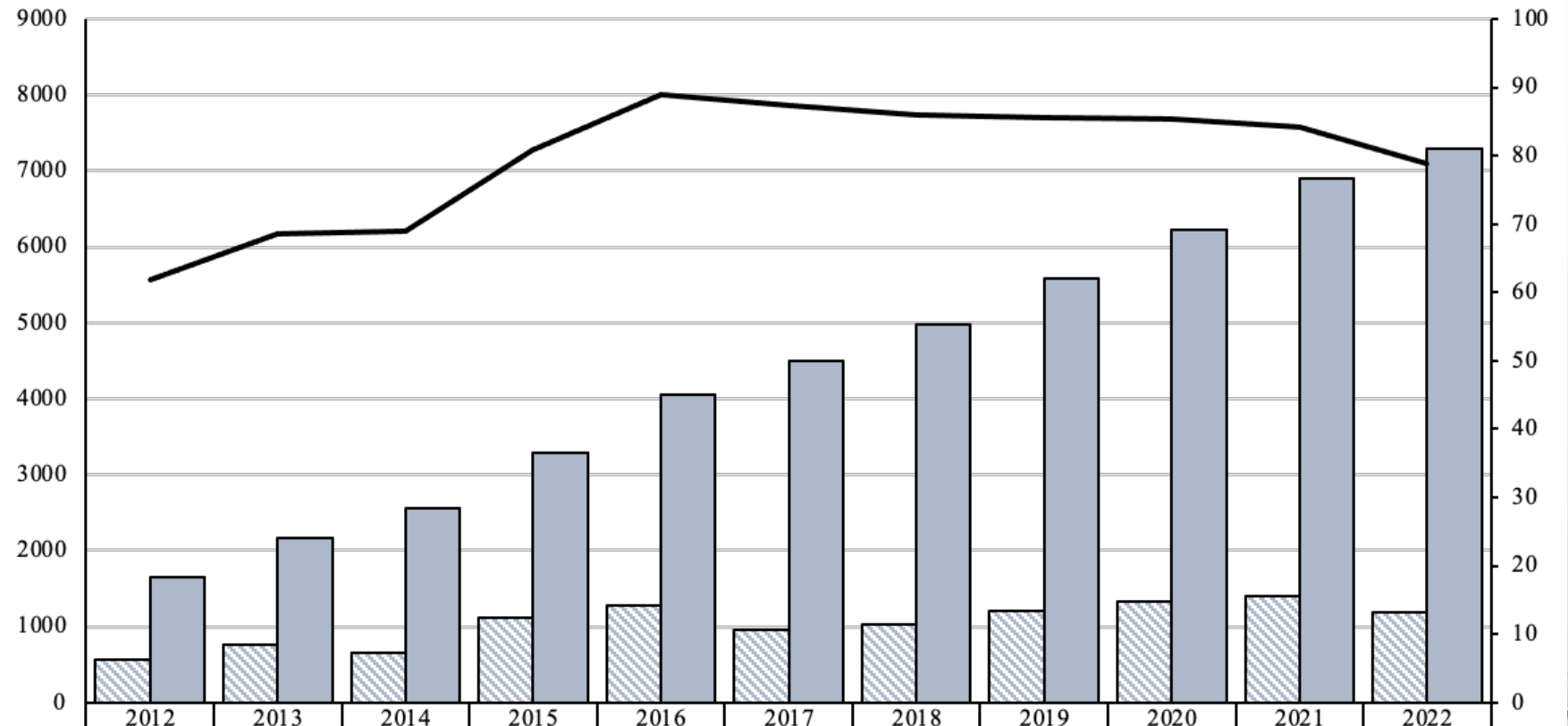
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
New mortgage loan issued in billion Yuan	557	768	659	1108	1270	953	1022	1214	1336	1396	1184
Outstanding mortgage loan in billion Yuan	1655	2173	2552	3286	4054	4505	4985	5588	6231	6893	7298
Loan to balance ratio	62	69	69	81	89	87	86	85	85	84	79

New mortgage loan issued in billion Yuan　　Outstanding mortgage loan in billion Yuan　　Loan to balance ratio

Data and methods

- Aggregated, city-level data from HPF Centres
  - official statistics, reliable, free of charge
  - cannot be used to analyze individual decisions
  - Example: Deng, L., Yan, X., Chen, J., 2019. Housing affordability, subsidized lending and cross-city variation in the performance of China's housing provident fund program. *Housing Studies*.
- Individual, self-reported data from surveys
  - Example: the 2011 Chinese Household Finance Survey in Tang, M., Coulson, N.E., 2017. The impact of China's housing provident fund on homeownership, housing consumption and housing investment. *Regional Science and Urban Economics* 63, 25-37.
  - Reporting errors (everybody lies!) - enrolment in the HPF programme reported by the respondents is only 0.616 years. The participation rate is also small – the proportion of households participating in the HPF programme is only 17.7%

Data and methods

- Individual, self-reported data from surveys

  - Example: China Health and Nutrition Survey (CHNS) between 1989 and 2009 in Xu, Y.L., 2017. Mandatory savings, credit access and home ownership: The case of the housing provident fund. *Urban Studies* 54, 3446-3463.

  - Proxy – number of years working in HPF-eligible companies

  - Indirect measurement, hence internal validity might be an issue

  - Reduces reporting error

  - A trade off!

Data and methods

- Xu, Y.L., 2017. Mandatory savings, credit access and home ownership: The case of the housing provident fund. *Urban Studies* 54, 3446-3463.

$$Y_{it} = \alpha_d D_{it} \times H_{it} + \alpha_s S_{it} \times H_{it} + \alpha_l L_{it} + X_{it}\beta + \theta_i + \mu_t + \mu_t \times P_i + \Phi(t) + \epsilon_{it}$$

- *Y_{it} equals one if household i has home ownership in year t, and zero otherwise*

- *D_{it} equals one if double enrolment, and zero otherwise*

- *S_{it} equals one if single enrolment, and zero otherwise*

- *H_{it} equals one for all years after 1998 when the HPF first provided home mortgage loans to employees*

- *X_{it} household characteristics*

- *L_{it} is the number of total enrolment years for household i, which is defined as the sum of the enrolment years for the house- hold head (L_{i1t}) and the spouse (L_{i2t}). For j=1,2:* $L_{ijt} = \begin{cases} t - 1994 & \text{if employed in the state sector or joint ventures} \\ t - 1999 & \text{if employed in the collective sector or private sector} \\ 0 & \text{otherwise} \end{cases}$

- *P_i: house prices at the provincial level*

Table 1. Summary statistics by enrolment status.

VARIABLE	(1) Before 1998	(2)	(3)	(4) After 1998	(5)	(6)
	Zero	Single	Double	Zero	Single	Double
Home Ownership						
Full ownership	0.916	0.725	0.312	0.957	0.885	0.717
Ownership incl. partial	0.918	0.747	0.402	0.959	0.927	0.824
Demographics						
Household size	4.257	3.734	3.290	3.935	3.580	3.017
Household head's age	36.523	35.391	36.423	47.453	46.689	47.383
Spouse's age	34.888	34.266	34.835	45.834	45.116	45.738
The 1st child is male	0.508	0.500	0.500	0.540	0.465	0.505
Age of the 1st child at 1998	15.742	14.987	14.689	15.245	13.993	13.964
Head high school graduate	0.150	0.318	0.505	0.196	0.430	0.620
Spouse high school graduate	0.132	0.279	0.479	0.156	0.343	0.584
Married	0.993	0.979	0.991	0.895	0.888	0.922
HH income ($\times$1000 Yuan inflated to 2009)	12.955	16.412	15.130	23.904	34.819	38.943
Years of enrolment	0.000	0.425	1.267	0.000	7.790	17.678
Observations	561	233	701	723	286	755

Notes: The sample consists of urban households whose head and spouse were between 18 and 40 years of age in 1989 and were surveyed in at least two of the eight waves of CHNS in 1989, 1991, 1993, 1997, 2000, 2004, 2006, and 2009, with at least one survey before 1998. The means are reported for households with zero, single, and double enrolment, respectively.

Table 2. The treatment effects on full home ownership.

	(1)	(2)	(3)	(4)	(5)	(6)
$D_{it} \times H_{it}$	0.382***	0.042	0.373***	0.039	0.373***	0.039
	(0.033)	(0.050)	(0.033)	(0.050)	(0.033)	(0.050)
$S_{it} \times H_{it}$	0.141***	−0.014	0.136***	−0.015	0.136***	−0.015
	(0.040)	(0.044)	(0.040)	(0.044)	(0.040)	(0.044)
length		0.021***		0.020***		0.020***
		(0.003)		(0.003)		(0.003)
Observations	3259	3259	3259	3259	3259	3259
Number of HHs	567	567	567	567	567	567
Household FE	YES	YES	YES	YES	YES	YES
Year×province FE	YES	YES	YES	YES	YES	YES
Control	NO	NO	YES	YES	YES	YES
Time trend	NO	NO	NO	NO	YES	YES

Notes: The dependent variable is a dummy for the full home ownership. D_{it} and S_{it} are dummies for households with double and single enrolment, respectively; H_{it} is a dummy for years after 1998. *Length* is the number of years since the earliest enrolment in the HPF program. *** $p<0.01$, ** $p<0.05$, * $p<0.1$, estimates and clustered standard errors from a Linear Probability Model are reported.

Data and methods

- China Health and Nutrition Survey (CHNS)

  - An international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute for Nutrition and Health (NINH, former National Institute of Nutrition and Food Safety) at the Chinese Center for Disease Control and Prevention (CCDC)

  - The survey took place over a 7-day period using a multistage, random cluster process to draw a sample of about 7,200 households with over 30,000 individuals in 15 provinces and municipal cities.

  - Data available: 1989 – 2015, 10 waves

  - https://www.cpc.unc.edu/projects/china

1. 填写家庭成员行号

2. 家庭成员的姓名？

3. 家庭成员的性别？
   - 1 男
   - 2 女

4. 出生日期？ ____年 ____月 ____日

5. 采用的是何种年历（阳历或阴历）？

6. 该家庭成员的出生日期修改过吗？
   - 0 没有
   - 1 有

7. 该家庭成员同户主是什么关系？

00 户主	06 岳父母/公婆
01 配偶	07 女婿/儿媳
02 父亲/母亲	08 其他亲属 (请注明:_____)
03 儿子/女儿	10 其他非亲属(请注明:_____)
04 兄弟/姐妹	
05 （外）孙子/（外）孙女/（外）孙女婿/（外）孙媳妇	

8. 他/她现在是否仍是该家庭成员？
   - 0 否
   - 1 是 (跳到问题11)

9. 他/她是什么时候搬离该户的？ ____年 ____月
   * 如果"死亡"，记录死亡日期，在问题10中记录编号7，然后询问下一个成员1-12项问题。
   * 如果"搬出"，记录搬出日期，询问问题10，然后询问下一个成员1-12项问题。
   * 如果日期"不知道"，记录 –99999。

10. 他/她现在住在哪？

1 本村/居委会	5 其它省市(请注明:_____)
2 本县	6 其它国家 (请注明:_____)
3 本市	7 死亡
4 本省	9 不知道

    *如果仍住在本村/居委会，请将该户也纳入调查。如果不是，调查到此为止，继续询问下一个成员1-12项问题。

11. 他/她现在是否仍然住在家中？

1 是的 (询问下一个成员问题1-12)	5 否，出国
2 否，在外上学	6 否，其它（请注明:_____)
3 否，服兵役	9 不知道
4 否，外出打工	

12. 他/她离家多久了？(月)
    * 如果 "不知道"，记录 –99。

十一、家庭房产（所有住户）

1. 你对你的住房/公寓拥有所有权吗？ _ L200
   - 0 否 (跳到问题6)
   - 1 是

2. 你的住房/公寓是自己购买或自建的吗？ _ L201
   - 0 否 (跳到问题8)
   - 1 是

3. 你贷款了吗？ _ L202
   - 0 否 (跳到问题5)
   - 1 是

4. 你每月要还多少贷款？ _ _ _ _ _ L203
   * 如果"不知道"，则记录-999。

2. 你在此工作中的职位是何种类型？ _ B5
   - 1 有雇工的个体经营者
   - 2 无雇工的个体经营者（包括农民）
   - 3 为他人或单位工作的长期工(包括各级企事业，大、中小集体企业，集体农场，私人企业）
   - 4 为他人或单位工作的合同工
   - 5 临时工
   - 6 领取工资的家庭工人
   - 7 无报酬的家庭帮工
   - 8 其它 (具体说明:_____)
   - 9 不知道

3. 你的工作单位是何种类型？ _ _ B6a
   - 01 政府机关
   - 02 国有事业单位和研究所
   - 03 国有企业
   - 04 小集体企业 (如乡镇所属)
   - 05 大集体企业(如县、市、省所属)
   - 06 家庭联产承包农业
   - 07 私营、个体企业
   - 08 三资企业 (属于外商、华侨和合资)
   - 09 其它 (具体说明:_____)
   - -9 不知道

Data and methods

- My approach

  - Follow Xu (2017)'s framework – use reliable proxies

  - Extend Xu (2017) by

    - Using data from the three most recent survey waves (2009, 2011, and 2015)

    - Adding more control variables

    - Investigating HPF's effect on second-home ownership

  - Fixed effect panel regression

Variable definition and descriptive statistics

Table 4.1: Variable definition and descriptive statistics

Variable name	Definition	CHNS datafile name	CHNS variable name	N	Mean	Standard Deviation
owner	=1 if the household head owns the property	Asset_12	L9	5101	0.92	0.27
secondhome	=1 if the household head owns a second home	Asset_12	L18A	5081	0.10	0.29
hpflength	Length of enrolment in HPF in years	jobs_12	B6	5101	4.24	4.77
hh_hpf	Total length of enrolment in HPF of all household members	jobs_12	B6	5101	8.14	8.92
sex	=1 if male	relationMast_pub_00	sex_1	3504	0.80	0.40
mson	=1 if the household head is married and has a son	relationMast_pub_00	rel_1，rel_2, and sex_2	5101	0.46	0.50
age	Age in years	surveys_pub_12	age	5101	55.09	10.69
hhincome	Household income in 1000 RMB	oinc_12	b2e	2008	42.86	67.50
city	=1 if live in city	surveys_pub_12	stratum	5101	2.16	1.05
sub	=1 if live in suburban area	surveys_pub_13	stratum	5101	0.16	0.36
local	=1 if live in town or county capital city	surveys_pub_12	stratum	5101	0.17	0.37
highschool	= 1 if high school diploma	educ_12	a12	5101	0.13	0.33
college	=1 if college degree	educ_12	a12	5101	0.24	0.43
scollege	=1 if spouse has college degree	educ_12	a12	4186	0.11	0.32
shighschool	=1 if spouse has high school diploma	educ_12	a12	4186	0.21	0.41
sindincome	=spouse's annual wage income in 1,000 RMB	oinc_12	b2e	1011	39.92	59.62
sage	Spouse's age	surveys_pub_12	age	4202	53.17	10.75

HPF participation length and homeownership rate
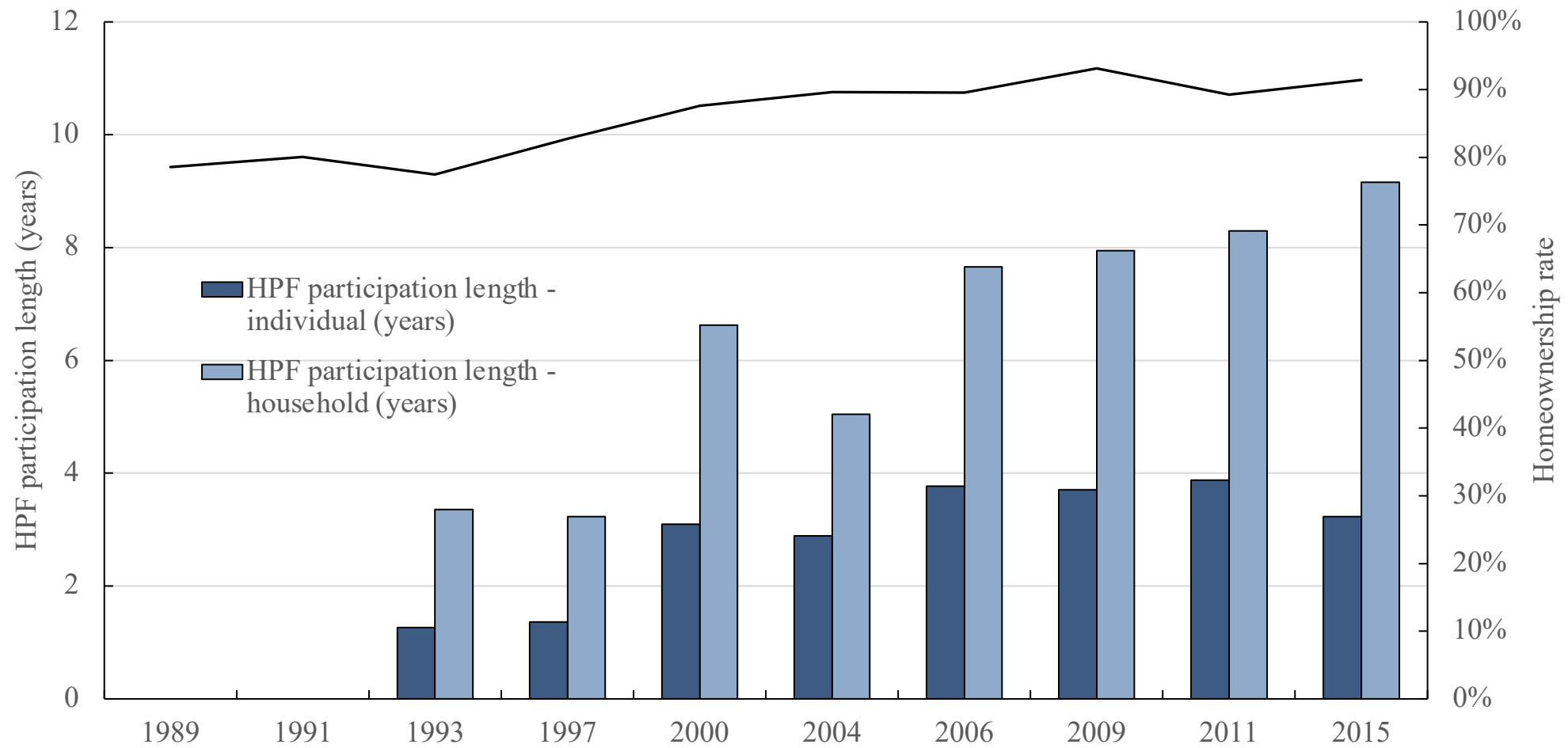
Proportion of HPF participants
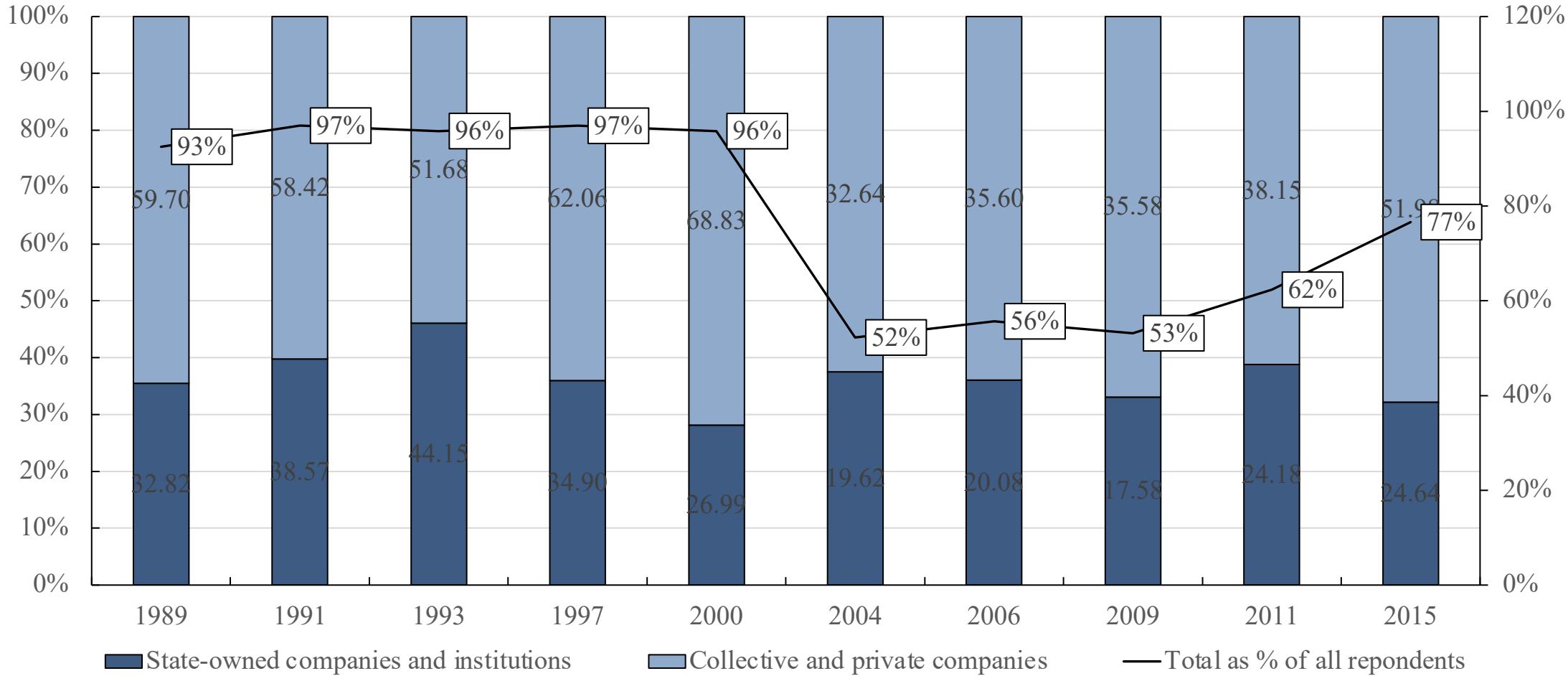
The notable drop of the 'Total as % of all respondent' in year 2004 is a combined result of the downsizing of state-owned sector in 1990s and the changes in survey methods

Table 4.2: Regression model output (dependent variable: *owner*)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
hpflength	0.0024***		0.0019		0.0029*	
	(0.0009)		(0.0039)		(0.0015)	
hh_hpf		0.0015***		0.0028		0.0021***
		(0.0005)		(0.0021)		(0.0008)
sex			0.1014*	0.1016**	0.0336*	0.0354**
			(0.0520)	(0.0514)	(0.0176)	(0.0174)
mson			0.0719*	0.0723*	0.0255*	0.0216*
			(0.0396)	(0.0395)	(0.0149)	(0.0149)
age			0.0042	0.0027	0.0131*	0.0128*
			(0.0222)	(0.0220)	(0.0074)	(0.0073)
age2			(0.0001)	(0.0001)	-0.0001*	-0.0001*
			(0.0002)	(0.0002)	(0.0001)	(0.0001)
hhincome			0.0002	0.0003	0.0002*	0.0002*
			(0.0003)	(0.0003)	(0.0001)	(0.0001)
City			(0.0023)	(0.0022)		
			(0.0201)	(0.0200)		
sub			0.0478	0.0476		
			(0.0518)	(0.0515)		
local			0.0722*	0.0715*		
			(0.0495)	(0.0493)		
college			0.1135*	0.1136*		
			(0.0707)	(0.0703)		
highschool			0.0865*	0.0853*		
			-0.0484	-0.0482		
scollege			-0.0802	-0.0883		
			-0.0672	-0.0673		
shighschool			-0.0299	-0.0312		
			-0.0513	-0.0512		
sindincome			0.0001	0.0001		
			-0.0003	-0.0003		
sage			0.0132**	0.0126**		
			-0.0056	-0.0056		
Constant	0.8473***	0.8459***	0.3184	0.3679	0.5577***	0.5653***
	(0.0130)	(0.0131)	(0.5466)	(0.5422)	(0.2019)	(0.2011)
R Square	0.0239	0.0244	0.1616	0.1677	0.0465	0.0486
Adjusted R Square	0.0216	0.0221	0.0602	0.0670	0.0350	0.0372
F	10.3409	10.5696	1.5941	1.6661	4.0671	4.2595
p-value	0.0000	0.0000	0.0393	0.0269	0.0000	0.0000

* $p<0.15$, ** $p<0.05$, *** $p<0.01$

Regression model output (dependent variable: *owner*)

Did Housing Provident Fund Help Chinese Households to Achieve Homeownership?

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
hpflength	0.0024***		0.0019		0.0029*	
	(0.0009)		(0.0039)		(0.0015)	
hh_hpf		0.0015***		0.0028		0.0021***
		(0.0005)		(0.0021)		(0.0008)
sex			0.1014*	0.1016**	0.0336*	0.0354**
			(0.0520)	(0.0514)	(0.0176)	(0.0174)
mson			0.0719*	0.0723*	0.0255*	0.0216*
			(0.0396)	(0.0395)	(0.0149)	(0.0149)

- The coefficient estimates of *hpflength* and *hh_hpf* are both significant and positive

- Both the household head's own contribution and the combined contribution to HPF by all household members improved the family's chance to own their home

- On average, one more year of participation in HPF by the household head will increase the chance of becoming a homeowner by 0.29%; while one more year of participation in HPF by all members in the same household combined will increase the probability of being a homeowner by 0.21%.

- Strong gender effect – male household heads and families with sons are more likely to own their apartments

Table 4.3: Regression model output (dependent variable: *secondhome*)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
hpflength	0.0023**		(0.0007)		0.0035*	
	(0.0009)		(0.0060)		(0.0020)	
hh_hpf		0.0024***		0.0038		0.0037***
		(0.0005)		(0.0032)		(0.0011)
sex			0.0199	0.0137	-0.0449*	-0.0476**
			(0.0814)	(0.0804)	(0.0231)	(0.0228)
mson			0.0045	0.0031		
			(0.0612)	(0.0609)		
age			0.0267	0.0211	-0.0033***	-0.0034***
			(0.0340)	(0.0336)	(0.0010)	(0.0010)
age2			(0.0004)	(0.0003)		
			(0.0003)	(0.0003)		
hhincome			0.0009**	0.0010**	0.0009***	0.0008***
			(0.0004)	(0.0004)	(0.0001)	(0.0001)
City			(0.0433)	(0.0444)		
			(0.0312)	(0.0311)		
sub			0.2347***	0.2314***		
			(0.0801)	(0.0797)		
local			0.0279	0.0276		
			(0.0766)	(0.0764)		
college			0.0873	0.0822		
			(0.1102)	(0.1094)		
highschool			0.0614	0.0583		
			-0.0744	-0.0741		
scollege			0.0414	0.0255		
			-0.106	-0.1062		
shighschool			0.0063	0.0055		
			-0.079	-0.0788		
sindincome			-0.0001	-0.0001		
			-0.0004	-0.0004		
sage			0.0160*	0.0152*		
			-0.0085	-0.0085		
Constant	0.0661***	0.0609***	-0.8439	-0.6932	0.3951***	0.3887***
	(0.0140)	(0.0141)	(0.8380)	(0.8314)	(0.0755)	(0.0750)
R Square	0.0177	0.0208	0.1974	0.2027	0.0664	0.0718
Adjusted R Square	0.0154	0.0185	0.0985	0.1044	0.0565	0.0619
F	7.5840	8.9434	1.9958	2.0631	6.6785	7.2643
p-value	0.0000	0.0000	0.0042	0.0028	0.0000	0.0000

* $p<0.15$, ** $p<0.05$, *** $p<0.01$

Regression model output (dependent variable: *secondhome*)

Did Housing Provident Fund Help Chinese Households to purchase a second home?

Table 4.2: Regression model output (dependent variable: *owner*)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
hpflength	0.0024***		0.0019		0.0029*	
	(0.0009)		(0.0039)		(0.0015)	
hh_hpf		0.0015***		0.0028		0.0021***
		(0.0005)		(0.0021)		(0.0008)
sex			0.1014*	0.1016**	0.0336*	0.0354**
			(0.0520)	(0.0514)	(0.0176)	(0.0174)
mson			0.0719*	0.0723*	0.0255*	0.0216*
			(0.0396)	(0.0395)	(0.0149)	(0.0149)
age			0.0042	0.0027	0.0131*	0.0128*
			(0.0222)	(0.0220)	(0.0074)	(0.0073)
age2			(0.0001)	(0.0001)	-0.0001*	-0.0001*
			(0.0002)	(0.0002)	(0.0001)	(0.0001)
hhincome			0.0002	0.0003	0.0002*	0.0002*
			(0.0003)	(0.0003)	(0.0001)	(0.0001)

Table 4.3: Regression model output (dependent variable: *secondhome*)

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
hpflength	0.0023**		(0.0007)		0.0035*	
	(0.0009)		(0.0060)		(0.0020)	
hh_hpf		0.0024***		0.0038		0.0037***
		(0.0005)		(0.0032)		(0.0011)
sex			0.0199	0.0137	-0.0449*	-0.0476**
			(0.0814)	(0.0804)	(0.0231)	(0.0228)
mson			0.0045	0.0031		
			(0.0612)	(0.0609)		
age			0.0267	0.0211	-0.0033***	-0.0034***
			(0.0340)	(0.0336)	(0.0010)	(0.0010)
age2			(0.0004)	(0.0003)		
			(0.0003)	(0.0003)		
hhincome			0.0009**	0.0010**	0.0009***	0.0008***
			(0.0004)	(0.0004)	(0.0001)	(0.0001)

- Yes, and the effect is stronger

- On average, one more year of participation in HPF by the household head will increase the chance of owning a second home by 0.35%; while one more year of participation in HPF by all members in the same household combined will increase the probability of owning a second home by 0.37%

- Female household heads are more likely to own a second home

- Whether there is a son in the family does not matter any more

Practical Session

- Go to the website of China Health and Nutrition Survey: https://www.cpc.unc.edu/projects/china

- Fill out the online registration form

- Get access to data download page. Try to download some of the dataset and questionnaires.

- Open data files and documentations from two different years. Check for differences, if any.

- Open the data that I sent to you in Excel format. Observe the difference between my data file and the data files you find from CHNS's website.

- Think about ways to improve this research. Have you heard about any similar data sources? Are there any other variables that should have been included in the analysis?

Conclusions

- The empirical findings are interesting and encouraging
- The empirical strategy (i.e., using proxy instead of direct measurement) has limitations
- However, field and objective measurements are preferred in behavioural studies
- This is a replication of Xu (2017), and more replications are needed to improve our understanding of the effect of HPF

Further readings
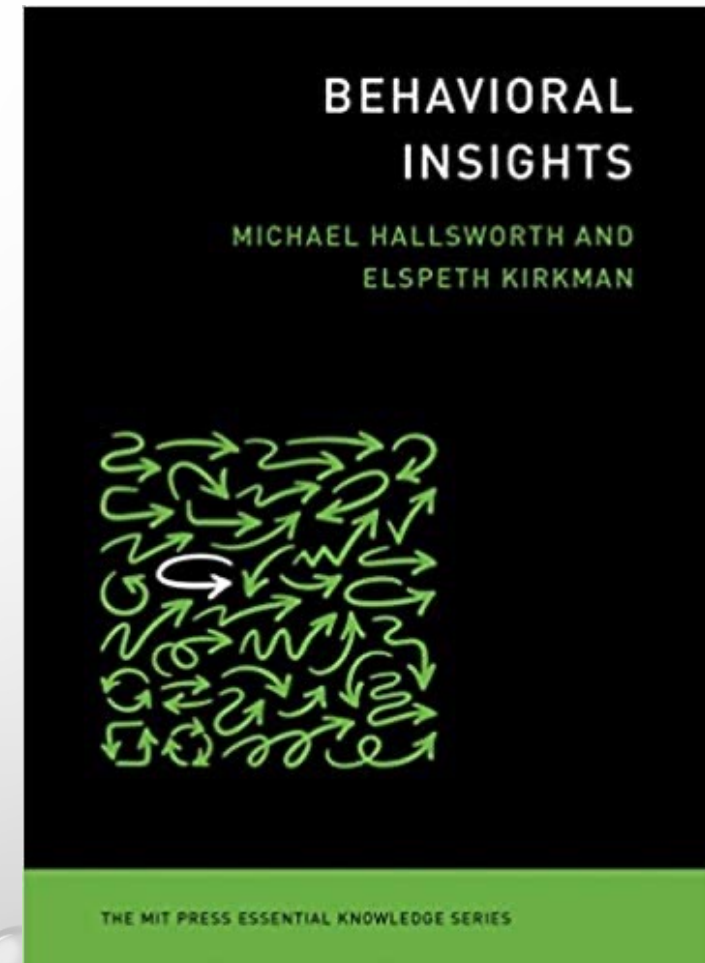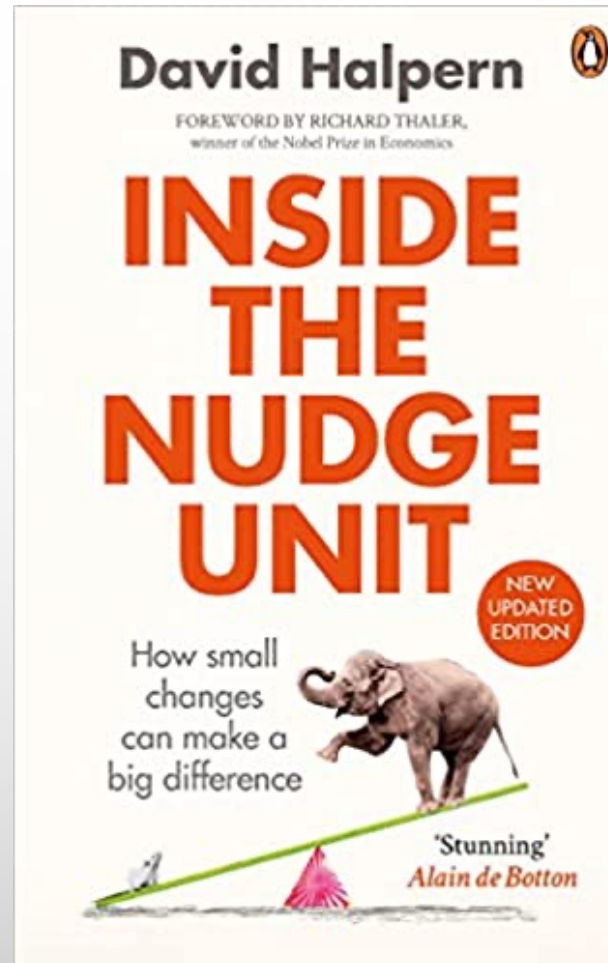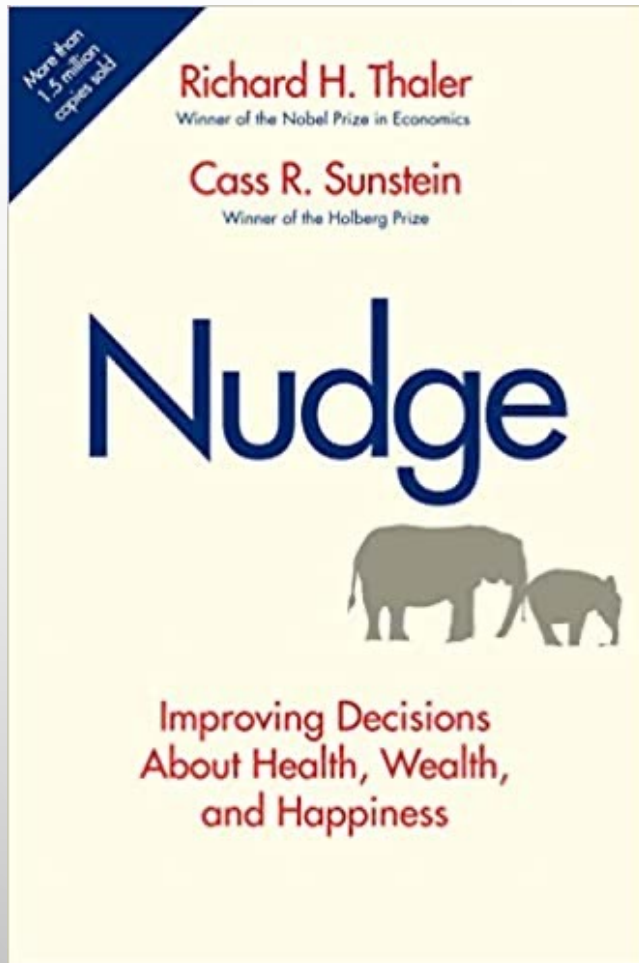
Summary

- Research questions
- Why homeownership matters?
- Behavioural tools at our disposal
- Housing provident fund in China
- Data and methods
- Findings and discussions
- Future research directions