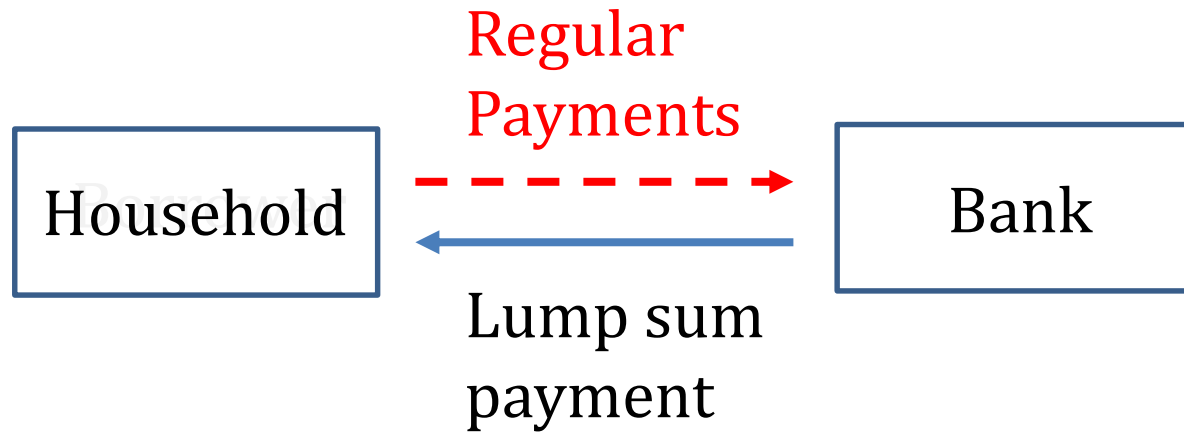# Cross-Sectional Evidence on Reverse Mortgage Choices in Korea
: Are Housing Pensions Attractive to House-rich and Cash-poor Households?

2022.11
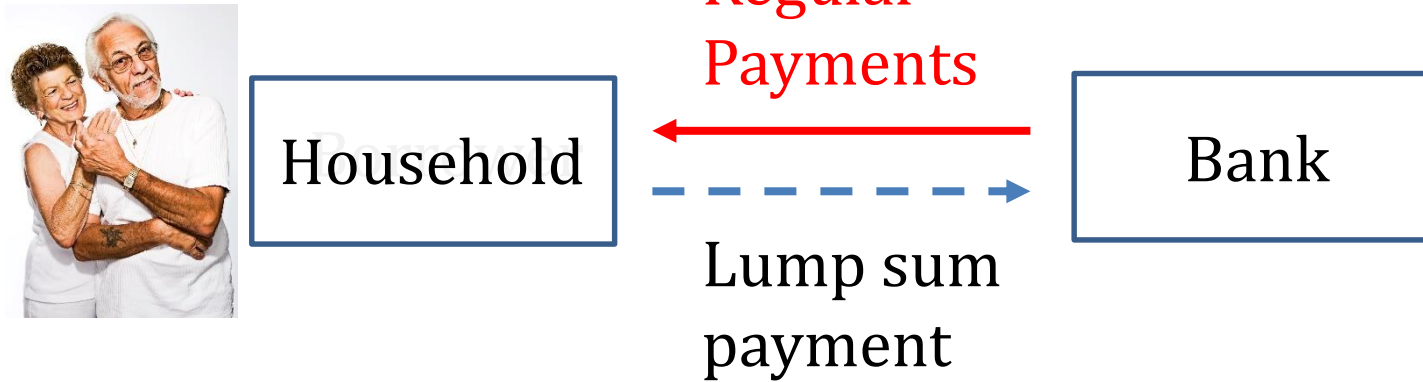
Seung Dong You

Sangmyung University

Forward mortgage

Household

Regular Payments

→

← Lump sum payment

Bank

Reverse mortgage :
Housing pension in Korea

Regular
Payments

Household ← Bank

Lump sum
payment

Contents

- **Background and Research Question**

- International Comparisons: US and Korea

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Background

- For general households, their home is the key asset they own

  - In 2009, half of American homeowners aged 62 or older(CFPB)

    - Fifty five percent of their net worth tied up in home equity

  - In 2015, 32.6 % of Korean homeowners aged 60 or older & 25.8 % of them aged between 50 to 60 (Statistics Korea)

    - Fifty two percent of their net worth tied up in home equity

    - Eighty two per cent of their net worth tied up in real estate assets

Relative Poverty Rate (OECD)

"The ratio of the number of people (in a given age group) whose income falls below the poverty line; taken as half the median household income of the total population"

UK: 11.2% and Korea 15.4%

Source: https://data.oecd.org/inequality/poverty-rate.html
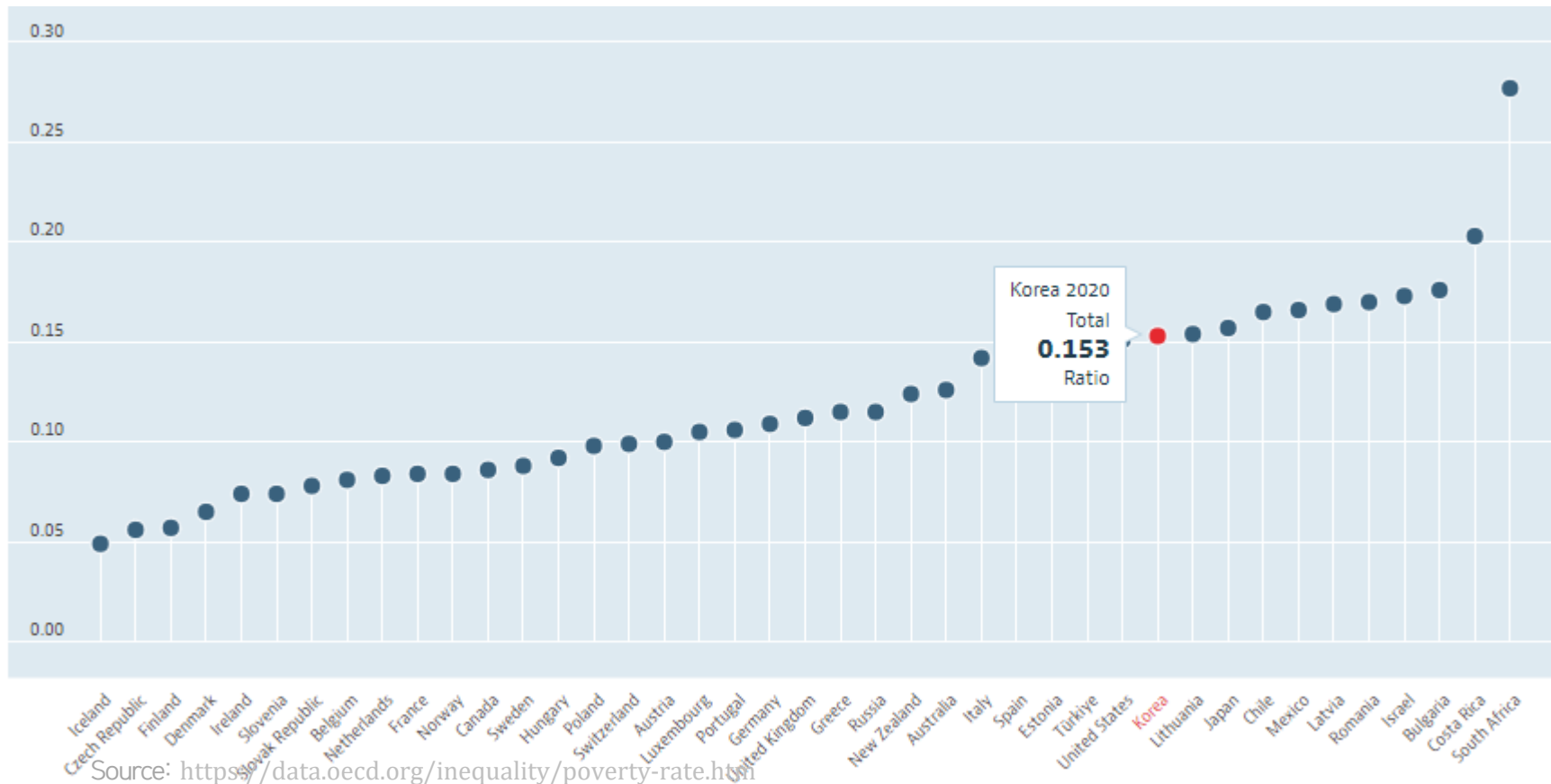
66 year-old and more (OECD)

UK: 13.2% and Korea: 40.4%

Source: https://data.oecd.org/inequality/poverty-rate.htm

Parents who live with their children
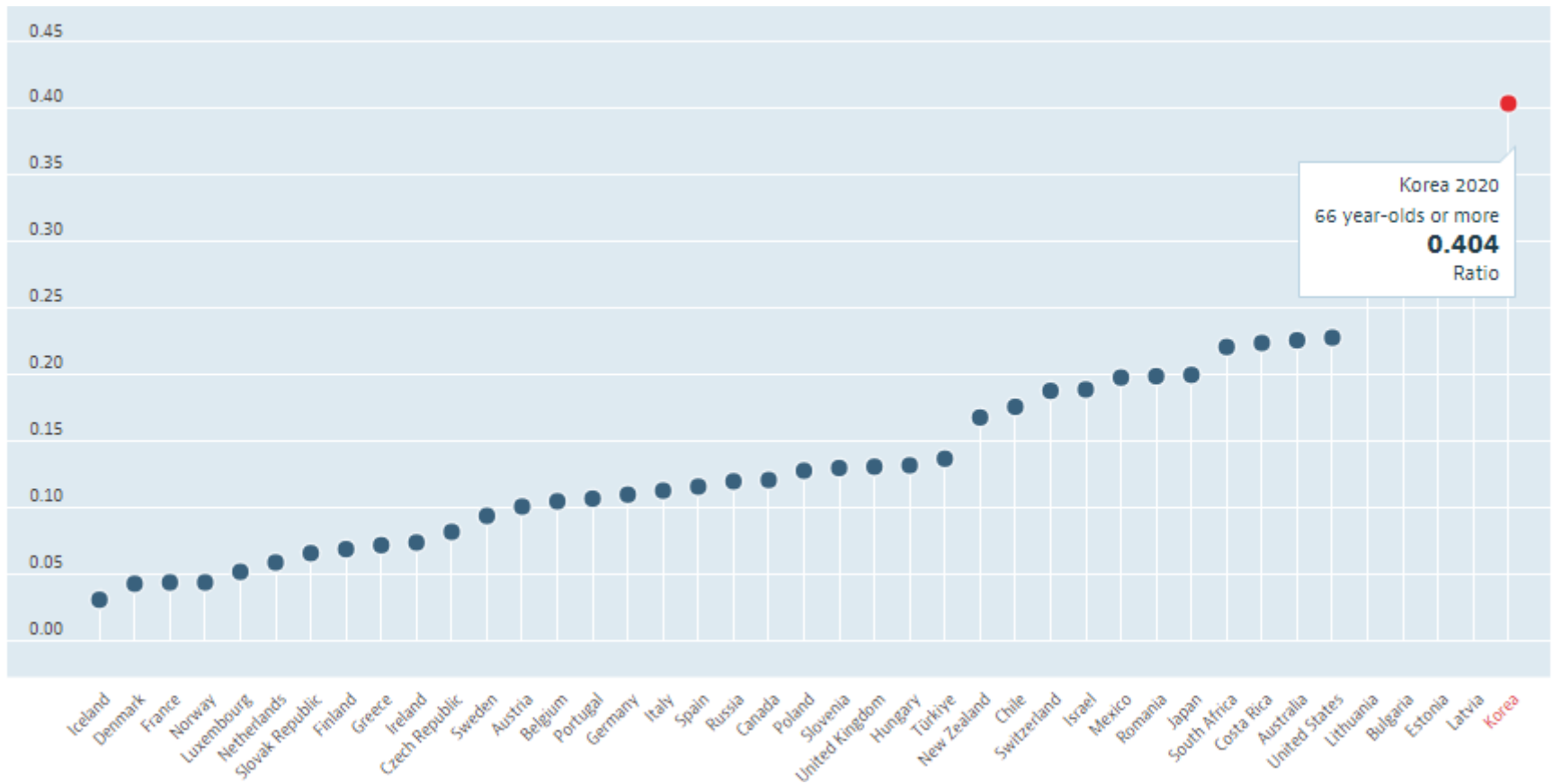
Per cent of parents who live with their children
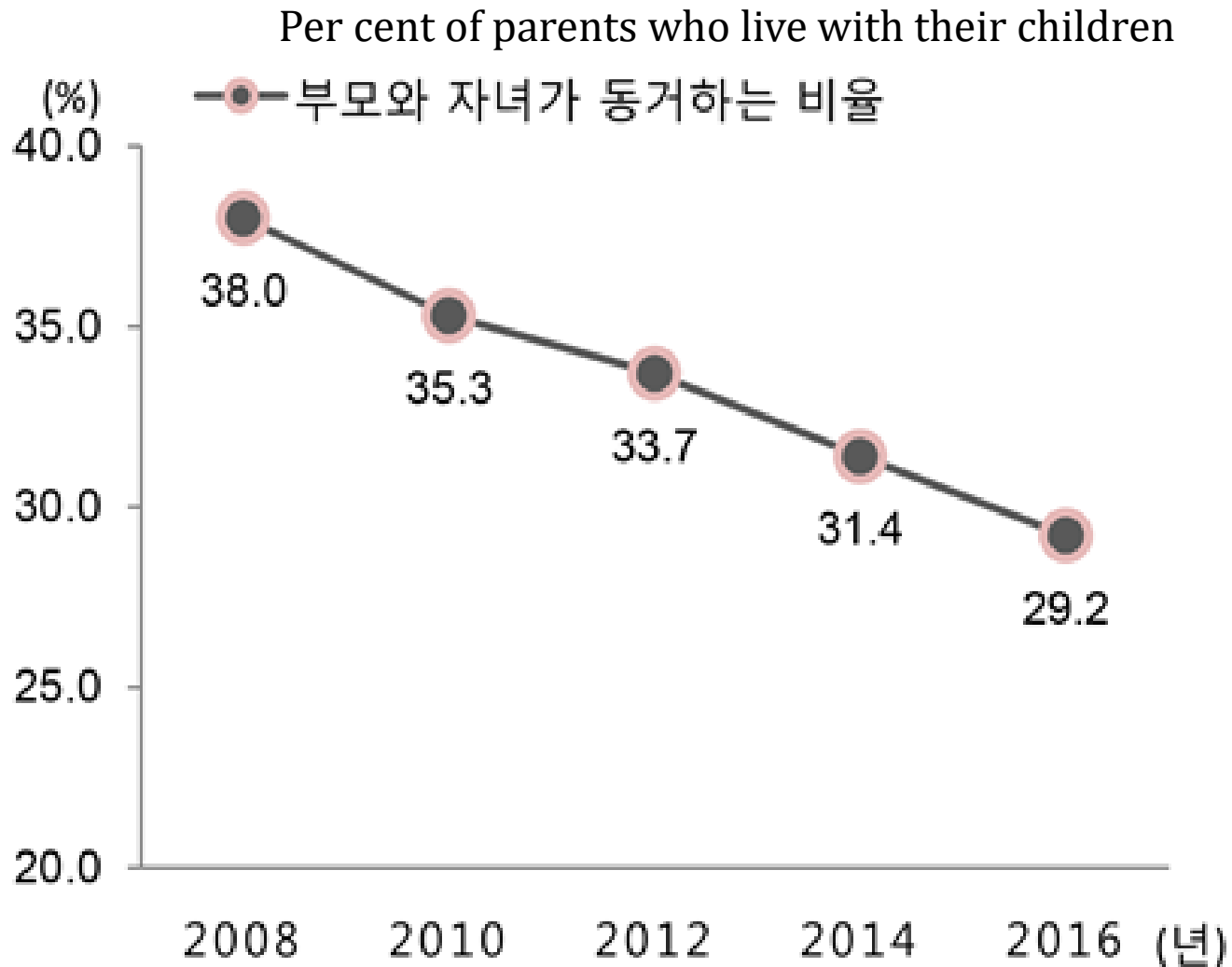
Parents who have willingness to live with their children

자녀와 동거 희망률

※2020년 3월~11월
전국 65세 이상
노인 1만 97명 조사

- 32.5% — 2008년
- 27.6% — 2011
- 19.1% — 2014
- 15.2% — 2017
- 12.8% — 2020

Source: https://economist.co.kr/2021/06/12/policy/checkReport/20210612143500253.html
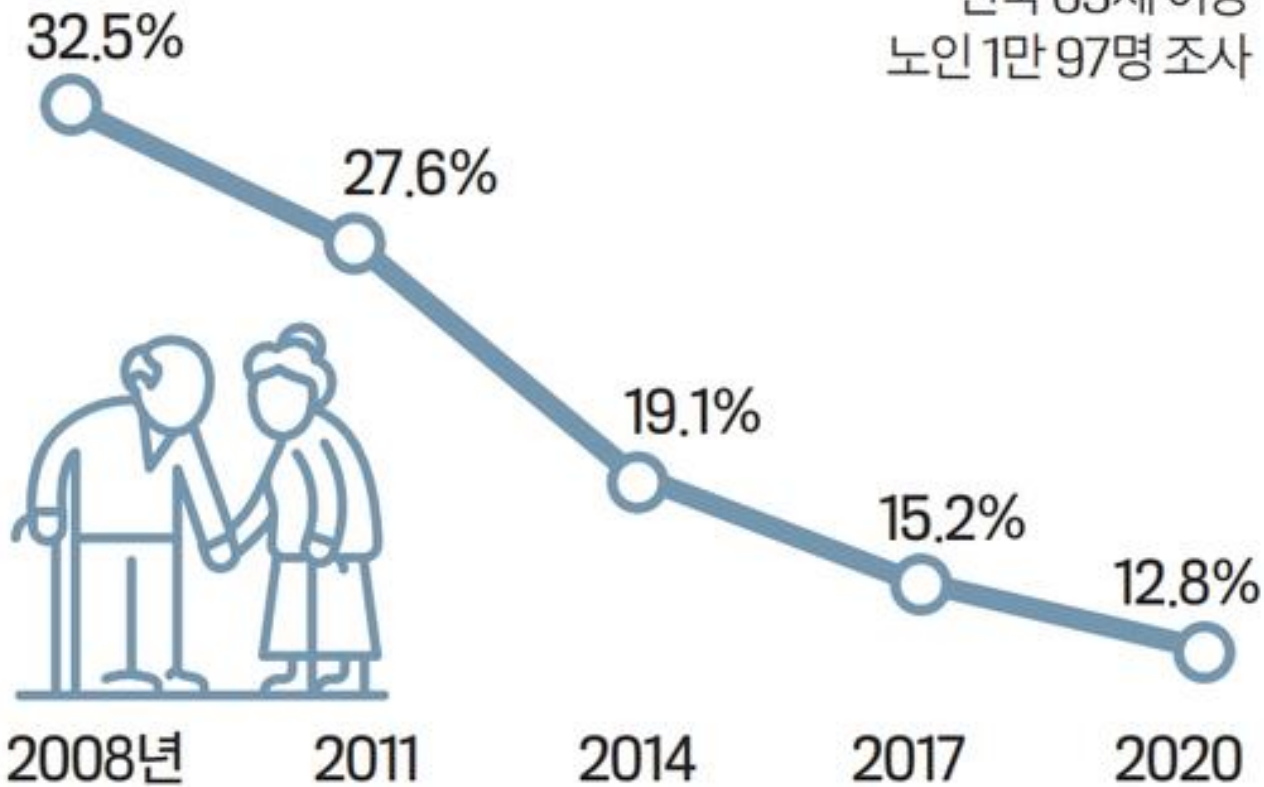
Sources of living costs
(elderly citizens >= 60 years)
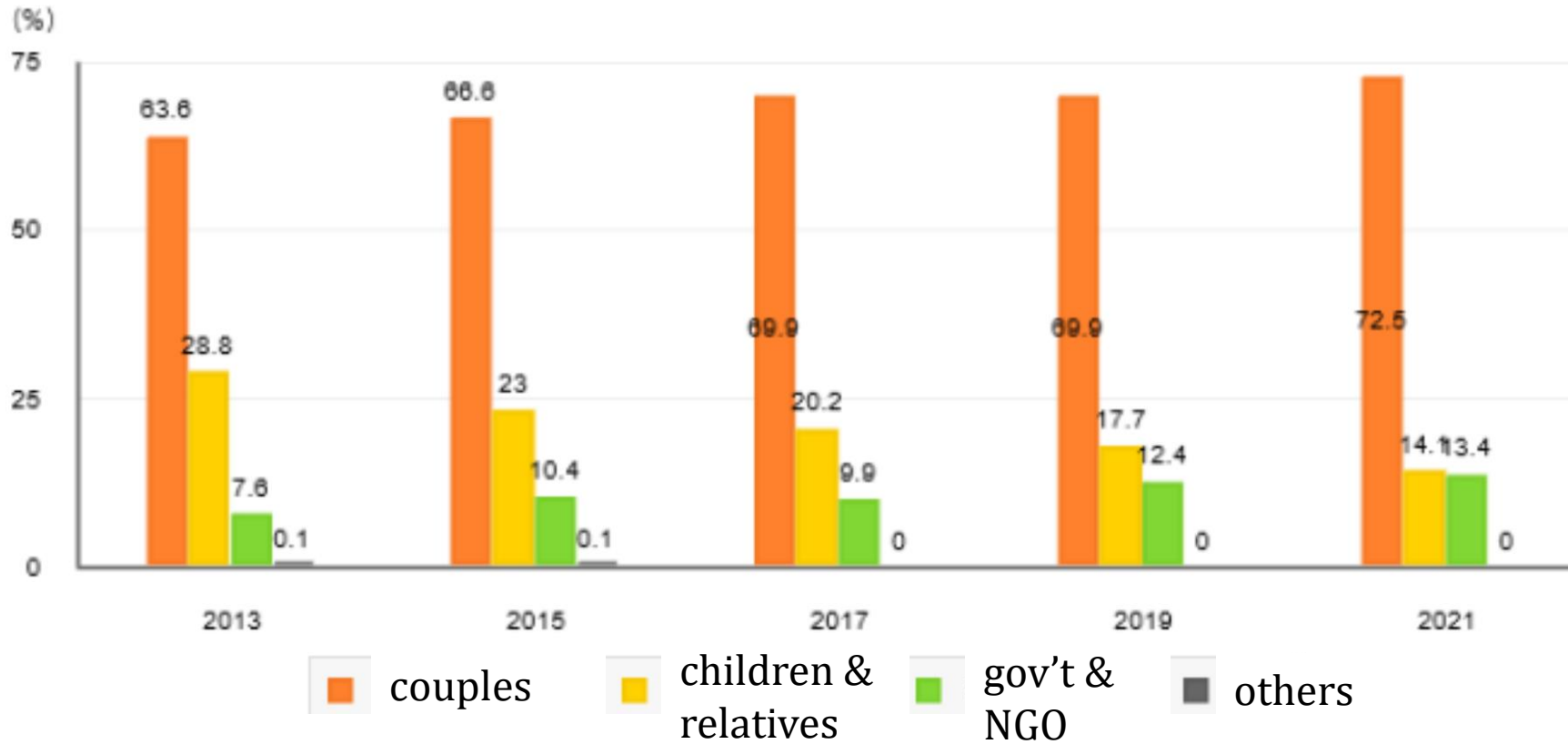
Shortage in living costs

- ## Labor income

  - The blessing of labor?

- ## Unlocking real assets

  - Downsizing the house (preference for aging in place) or renting the house
  - Cash-out financing (repayment burdens at the maturity)
  - Reverse mortgage

Reverse mortgages

- RM are for elderly homeowners
  - 55 years or older (in Korea), 55 years or older (in UK), and 62 years or older (in US)
  - Aging in place
  - Allowing the owners to convert their home equity into cash

- Cash poor but house rich
  - Mayer and Simons (1994), Davidoff and Welke (2004), Frantantoni (1999), Haurin, et al. (2014), Shan (2011), and Tsay et al. (2014)
  - US, Korea, Hong Kong, Singapore, Japan, UK, …

Research question and contribution

- Are RMs financial products for the house−rich and cash−poor?

  – Little empirical evidence

  – But too much discussion and a series of policies in many countries

    • What if RMs are for house rich and cash rich ?
    • Bequest incentive (Mayer and Smith, 1995)

- Empirical evidence with a household−level data set

  – Korean RMs (*aka* housing pensions) : non−US evidence

  – Labour income vs. non labour income

Ageing and housing markets

- Mankiw and Weil (1989)

  - Decline in real house price, even though real income rises

- Hiller and Lerbs (2015): Ageing and Urban House Prices

  - 85 cities in Germany over 1995–2012

  - Local aging and **population shrinkage** have economically

    meaningful impact on house prices

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RM in US

- Typical home equity loans but reverse cash flows
  - Homeowners age 62 or over
  - Most reverse mortgages are called Home Equity Conversion Mortgages (HECM)

- HECM is guaranteed by Housing and Urban Development (HUD)
  - Introduced in 1989
    - The FHA(Federal Housing Agency) takes all the risks
  - RM borrowers can stay in the house until the house is sold or the borrower moves out or passes away

HECM endorsements

Source: https://www.nrmlaonline.org/annual-hecm-endorsement-chart

RM in Korea: housing pensions

- RM introduced in 2007
  - RM TFT in 2005
  - Korea Housing Finance Corp. (KHFC) developed a public guarantee product
    - Similar to HECMs
    - Korean name: Housing Pensions (HP)
    - KHFC has been operating the HP program

- Private products did not succeeded in the early 2000s
  - High risks: in particularly longevity risks

HP endorsements
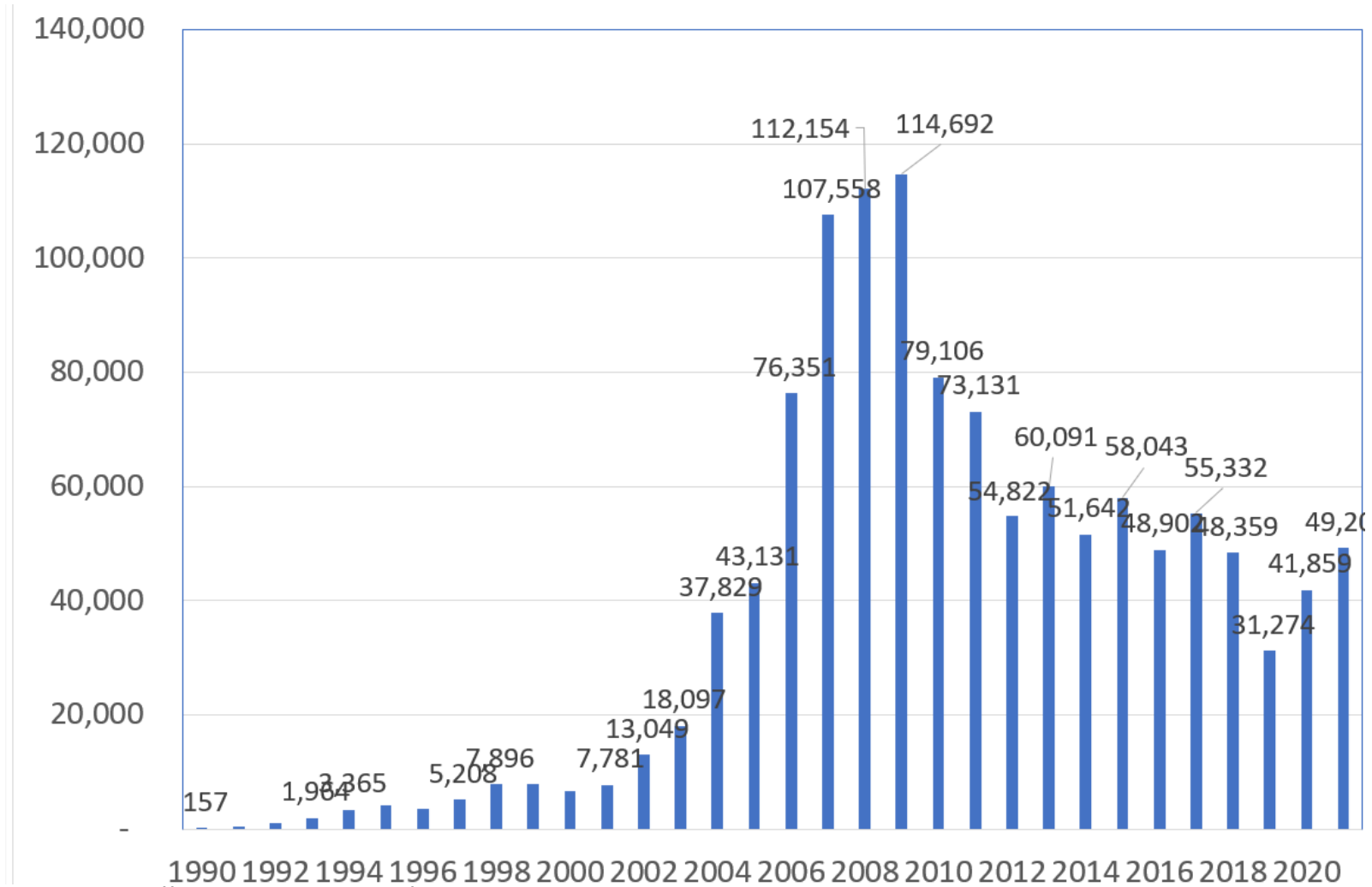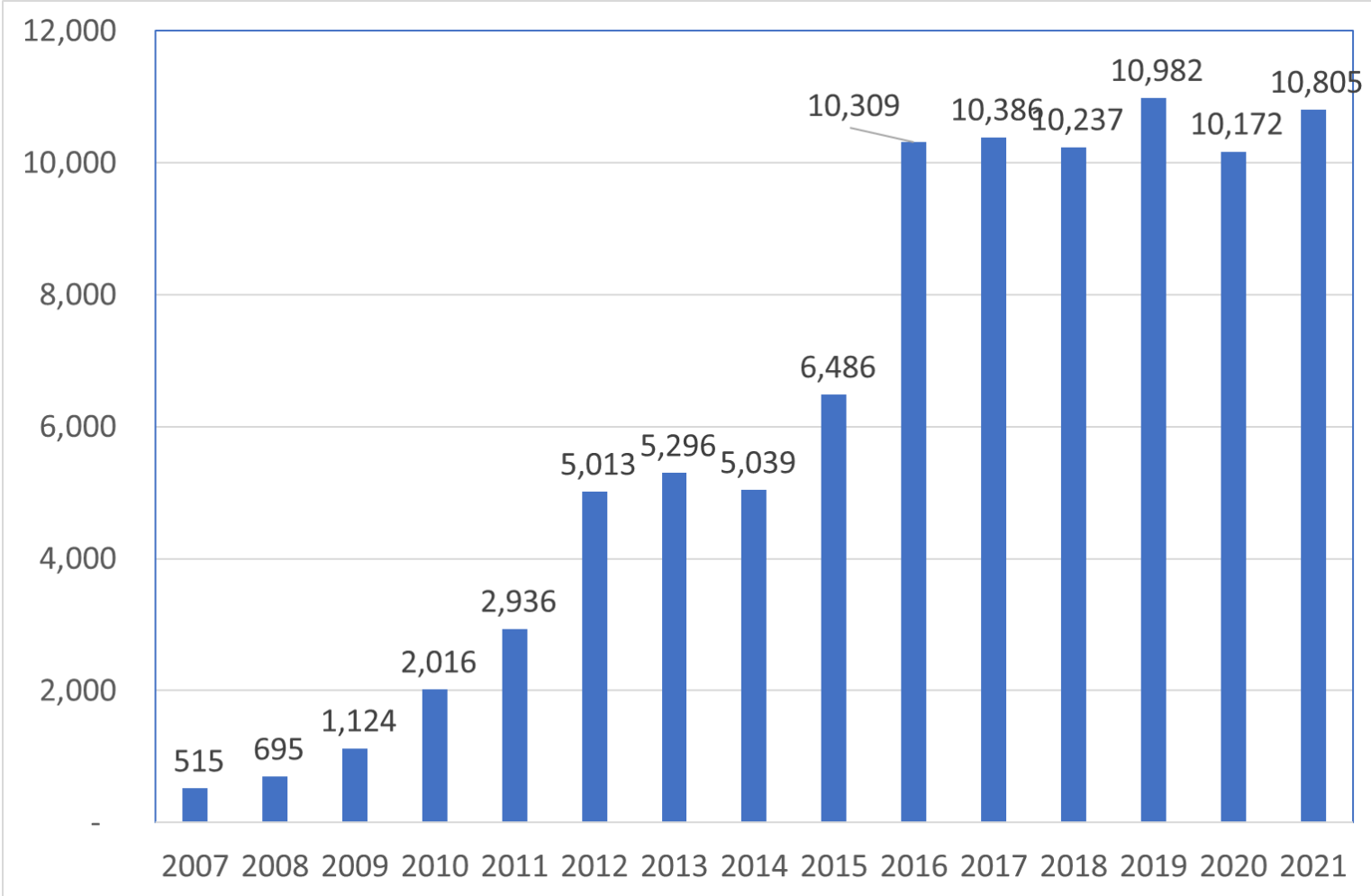

Source：Korea Housing Finance Corp

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Literature review

- Trend of previous research(Tsay et al., 2014)
  - Pricing mechanisms
  - Introduction of RM systems

- Chou et al (2006: *Habitat Int'l*): an imaginary product in HK
  - 1867 middle-aged adult and 663 of them are owners
  - Willingness to consider apply for reverse mortgage (5-point scale)
    - 11 percent of definitely would or probability would
    - 32.6 percent are neutral
  - Childless (+), amount of financial assets (+)
    - Self-evaluated financial strains: insignificant

- Frantantoni (1999): Journal of Housing Research
  - Reverse mortgage product choice, payment duration choice
    - tenure, fixed-term, line of credit, combinations
  - Business and marketing purpose

- This study: choice b/w RM borrowers and non borrowers

- Shan (2011, REE) : Reverting the Trend
  - The size of the US market is smaller than expected
    - Demand side: bequest, medical expense, interaction with welfare program, complex financial product
    - Supply side: document requirements, regulations, difficult to securitize and finance
  - Zip-code data: 1987-2007
    - Missing age, gender, marital status, income or demographic characteristics
  - RM take-out when the local housing market at its peak
    - Borrowers' behaviors vary across time
    - 2000-2005 housing boom is partially responsible for the rapid growth (one year house appreciation rate)
    - Income-poor but housing-rich areas

- Haurin *et al* .(2014, JRFE): Local Variation in Reverse Mortgage Usage
  - State-level variation
  - Lock-in their equity gain by obtaining reverse mortgages
    - Seniors rationally anticipate future reductions in house prices
    - House price volatility are critical and their prices are higher than an average: insurance motive

- No research with a micro-level data

- Nakajima and Telyukova (2017:JoF)
  - Household-level decisions
  - Households with low income and low wealth
    - Low wealth represents more outstanding mortgage(hard to measure)
  - Low bequest motives and poor health
    - Singles
    - More medical expenditure
  - Expectation on future house prices

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Data

- 2012 KHFC HP Survey

  - 600 HP borrowers and 2,000 non-borrowers

    - The non-borrowers are locally distributed according to the 2010 Census

  - More than 60 years or older

    - Eligible borrowers

    - Face-to-face interviews (rationality)

Key variables

	Variables	Definition
Dependent variables	rev	1 if the household subscribed to a housing pension, 0 otherwise
Wealth	Ltw	Log(total wealth+1)
	Lnonhouse	Log(nonhousing wealth +1)
	Lhouse	Log(housing wealth +1)
Income per a year	Linc	Log(income+1)
	Llabinc	Log(labor income+1)
	Lnonlaborinc	Log(nonlabor income+1)
	Lincpen	Log(pension income+1)
	Lincfinre	Log(income from financial assets or real assets+1)

Other covariates

	Variables	Definition
Household head's characteristics	Age	Household head's age
	Dage	Age*age
	Female	1 if the household head is female, 0 otherwise
	Col	1 if the household head holds a college degree, 0 otherwise
	Ret	1 if the household head is retired, 0 otherwise
Household's characteristics	Dep	No of dependents (including the spouse)
	Lmed	Log(yearly medical expense +1)
	Ldebt	Log(yearly debt payment +1)
House characteristics	Apt	1 if the household head lives in a condominium, 0 otherwise
	Lsize	Log(house size)
	Area	Provinces in Korea

Summary statistics

Variable	Obs	Unit	Mean	Std. Dev.	Min	Max
rev	2574	binary	0.23	0.42	0	1
tw(total wealth)	2574	KRW M	439.33	2887.66	10	99990
nonhouse	2574	KRW M	218.61	2881.65	0	99910
house	2574	KRW M	223.39	169.87	10	900
inc	2574	KRW M	16.66	14.70	0	180
laborinc	2574	KRW M	8.64	12.78	0	135
nonlabinc	2574	KRW M	8.02	9.25	0	120
incpen	2574	KRW M	3.53	6.46	0	60
incfinre	2574	KRW M	2.24	5.75	0	120
age	2574	age	70.26	6.64	60	88
female	2574	binary	0.50	0.50	0	1
col	2574	binary	0.11	0.31	0	1
ret	2574	binary	0.59	0.49	0	1
dep	2574	binary	1.27	1.11	0	8
med	2574	KRW M	2.11	2.20	0	24
debt	2574	KRW M	0.32	1.43	0	25.704
apt	2574	binary	0.52	0.50	0	1
size	2574	m2	101.09	71.85	13.2	1623.60

Empirical evidence

		Model 1	Model 2	Model 3	Model 4
ltw		1.0925***	0.8403***		
		(0.12)	(0.11)		
	lnonhouse			0.0404	0.2117***
				(0.03)	(0.04)
	lhouse			1.2794***	1.2730***
				(0.13)	(0.14)
linc		-2.0510***			
		(0.13)			
	llabinc		-0.3492***	-0.3316***	-0.3526***
			(0.04)	(0.04)	(0.04)
	lnonlabinc		-0.4260***	-0.3921***	
			(0.04)	(0.04)	
	lincpen				-0.2488***
					(0.03)
	lincfinre				-0.3893***
					(0.03)
age		0.0310**	0.0876***	0.0918***	0.0733***
		(0.01)	(0.01)	(0.01)	(0.01)
female		0.7382***	0.4090***	0.4498***	0.5995***
		(0.18)	(0.15)	(0.15)	(0.16)
col		1.7425***	1.2416***	1.1177***	1.1904***
		(0.24)	(0.21)	(0.22)	(0.23)
ret		1.2158***	0.6798**	0.6068*	0.41
		(0.23)	(0.32)	(0.32)	(0.33)
dep		-0.2541***	-0.2364***	-0.2770***	-0.3365***
		(0.08)	(0.07)	(0.07)	(0.07)
lmed		0.4136***	0.1974***	0.1662***	0.1834***
		(0.07)	(0.05)	(0.05)	(0.05)
ldebt		-0.1553**	-0.1985***	-0.1897***	-0.1802***
		(0.08)	(0.06)	(0.06)	(0.07)
apt		1.9604***	1.8322***	1.6724***	1.7287***
		(0.20)	(0.17)	(0.17)	(0.18)
lsize		-1.4850***	-1.9409***	-2.3310***	-2.0816***
		(0.26)	(0.24)	(0.25)	(0.27)
cons		6.5631***	-3.1072**	-3.7808***	-4.5833***
		(1.67)	(1.35)	(1.39)	(1.48)
N		2574	2574	2574	2574

Empirical evidence

		Model 1	Model 2	Model 3	Model 4	
ltw		1.0925***	0.8403***			
		(0.12)	(0.11)			
	lnonhouse			0.0404	0.2117***	
				(0.03)	(0.04)	
	lhouse			1.2794***	1.2730***	House Rich
				(0.13)	(0.14)	
linc		-2.0510***				
		(0.13)				
	llabinc		-0.3492***	-0.3316***	-0.3526***	
			(0.04)	(0.04)	(0.04)	Cash Poor
	lnonlabinc		-0.4260***	-0.3921***		
			(0.04)	(0.04)		
	lincpen				-0.2488***	
					(0.03)	
	lincfinre				-0.3893***	
					(0.03)	

Empirical evidence

age	0.0310**	0.0876***	0.0918***	0.0733***	For the old
	(0.01)	(0.01)	(0.01)	(0.01)	
female	0.7382***	0.4090***	0.4498***	0.5995***	
	(0.18)	(0.15)	(0.15)	(0.16)	
col	1.7425***	1.2416***	1.1177***	1.1904***	Knowledge
	(0.24)	(0.21)	(0.22)	(0.23)	
ret	1.2158***	0.6798**	0.6068*	0.41	
	(0.23)	(0.32)	(0.32)	(0.33)	
dep	-0.2541***	-0.2364***	-0.2770***	-0.3365***	Bequest motives
	(0.08)	(0.07)	(0.07)	(0.07)	
lmed	0.4136***	0.1974***	0.1662***	0.1834***	Medical expense
	(0.07)	(0.05)	(0.05)	(0.05)	
ldebt	-0.1553**	-0.1985***	-0.1897***	-0.1802***	
	(0.08)	(0.06)	(0.06)	(0.07)	
apt	1.9604***	1.8322***	1.6724***	1.7287***	
	(0.20)	(0.17)	(0.17)	(0.18)	
lsize	-1.4850***	-1.9409***	-2.3310***	-2.0816***	
	(0.26)	(0.24)	(0.25)	(0.27)	
cons	6.5631***	-3.1072**	-3.7808***	-4.5833***	
	(1.67)	(1.35)	(1.39)	(1.48)	
N	2574	2574	2574	2574	

Conclusion

- HP is for house rich and cash poor

  - A micro data set

    - Heterogeneous wealth and income

    - Other variables such as education, medical expense..

  - Policy implications

    - Asset-based welfare

  - Limitation

    - No price dynamics and robustness check(controlled for a province dummy)