Behavioural Economics and Housing Decisions

Lecture Five: Endowment Effect and House Price Estimation

By Helen Bao

Outline

- Research questions
- House price estimation
- Endowment effect
- Data and methods (Online panel data)
- Findings and discussions
- Future research directions

Research Questions

- Is there an endowment effect in the UK housing market?
- Does endowment effect change with market condition?

- Related questions:
  - How are house prices estimated?
  - What is endowment effect?
  - How does endowment effect manifest itself in housing market?

House price estimation

- The rational approach
  - Hedonic price modelling
  - Observational data
  - Revealed preference
  - An application of multiple linear regression
  - A technique to estimate economic values for factors that directly affect market prices

Hedonic price modelling

- Classic readings
  - Waugh, F.V. (1928) Quality factors influencing vegetable prices. *Journal of Farm Economics* 10(2):185-196.
  - Court, A.T. (1939) Hedonic price indexes in automotive examples. in *The Dynamics of Automobile Demand*. New York: The General Motors Corporation, pp.99-117.
  - Ridker & Henning (1967) The determinants of property values with special reference to air pollution. *Review of Economics and Statistics* 49: 246-257.
  - Rosen, S. (1974). Hedonic prices and implicit markets: product differentiation in pure competition. *Journal of Political Economy* 82, 34-55.

Hedonic Price Modelling

- The model

$$P_i = c + \sum_{i=1}^{k} \alpha_i S_i + \sum_{i=1}^{l} \beta_i N_i + \sum_{i=1}^{m} \gamma_i T_i + \varepsilon$$

- Interpretation:
  - P_i: House prices (not directly observable, but are determined by attributes)
  - S_i: Structural characteristics such as size and floor level
  - N_i: Neighborhood characteristics such as distance to city centre
  - T_i: Time dummies to capture price trend (or macroeconomic trend)
  - α_i and β_i indicate the marginal economic values of attributes
  - Price is found by adding up all attributes' economic values

Hedonic Price Modelling

- Challenges
  - Omitted variable bias: there is always some information missing from the dataset; impossible to know the value of all house price determinants (e.g., internal decoration is difficult to quantify).
  - Specification errors: not all housing attributes are linearly related to prices. Size, age and floor levels are known to have non-linear relationship with prices. Other attributes are less clear.
  - As a result, valuations and index number estimations from hedonic price models can be misleading

Hedonic price modelling

- Applications
  - Waltert, F., & Schlapfer, F. (2010). Landscape amenities and local development: A review of migration, regional economic and hedonic pricing studies. *Ecological Economics, 70*, 141-152.
  - Yoo, S., & Wagner, J. E. (2016). A review of the hedonic literatures in environmental amenities from open space: A traditional econometric vs. spatial econometric model. *International Journal of Urban Sciences, 20*, 141-166.
  - Hu, X. B., Yang, Y., & Park, S. (2019). A meta-regression on the effect of online ratings on hotel room rates. *International Journal of Contemporary Hospitality Management, 31*, 4438-4461.
  - Nicholls, S. (2019). Impacts of environmental disturbances on housing prices: A review of the hedonic pricing literature. *Journal of Environmental Management, 246*, 1-10.
  - Turnbull, G. K., & Zheng, M. R. (2021). A Meta-Analysis of School Quality Capitalization in US House Prices. *Real Estate Economics*. 49(4): 1120–1171.

Case Study:

The weekly index based on transactions handled by a large agency in Hong Kong (20 – 40% market share)

https://hk.centanet.com/CCI/

Constituent Estates

HK Island | Kowloon | NT (East) | NT (West)

Constituent Estates	Adjusted Unit Price (net area basis) (This week)	Prev. Month	Compare
寶翠園	27784.39	↑ 0.09%	⊕
翰林軒	22579.97		⊕
泓都	24501.75		
嘉輝花園	20472.53		
學士臺	17873.02		
帝后華庭	22942.46		
聚賢居	24694.52		
雍景臺	23719.43		
地利根德閣	34321.76		

Land Registry Transaction Records

Reg. Date	Address	Transaction Price	Net Area	Unit Rate of Saleable Area
22/07/14	The Belchers · Phase 1 · Tower 3 · 52/F · Flat A	$2,070 萬	755ft²	$27,417
22/07/13	The Belchers · Phase 2 · Tower 8 · 26/F · Flat G	$3,200 萬	1,267ft²	$25,257
22/06/27	The Belchers · Phase 1 · Tower 3 · 45/F · Flat C	$1,738 萬	667ft²	$26,057
22/06/24	The Belchers · Phase 2 · Tower 6 · 46/F · Flat H	$3,280 萬	1,141ft²	$28,747
22/06/16	The Belchers · Phase 2 · Tower 5 · 20/F · Flat E	$1,820 萬	1,097ft²	$16,591

Case Study: Centa-City Index (Hong Kong)

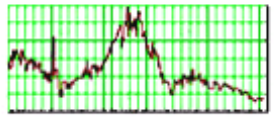
The old online free valuation system (2004)

學校教育 詳情	小學校網: 第 19 區, 共有小學 4 間. ...小學詳列 分佈圖 中學校網: 南區, 共有中學 13 間. ...中學詳列 分佈圖
鄰近設施	飲食指南 康體消閒 醫療服務 便民設施 政府社團
城市基建	都會建設 公共交通

中原分行

時代廣場分行 Team A
日:28343212
夜:25756042
時代廣場分行 Team B
日:28930313
夜:25268515
時代廣場分行 Team C
日:25112611
夜:28385679
壽臣山分行
日:28031738
夜:25527353
環球分行(山頂南區組) 環球分行(山頂南區組)
日:28106608
夜:25756042

中原城市指數CCI走勢圖



資料顯示: 單位面積 中原城市估價

下列之紫色數字爲中原城市指數本週估價 (更新日期:2004/2/27)
最高 HK$**7218** / 方尺, 最低 HK$**6387** / 方尺

單位	圖則	21	23	25	27
23/F	●	919 萬 1304 呎	944 萬 1308 呎	894 萬 1259 呎	914 萬 1295 呎
22/F	●	918 萬 1304 呎	943 萬 1308 呎	892 萬 1259 呎	912 萬 1295 呎
21/F	●	916 萬 1304 呎	941 萬 1308 呎	891 萬 1259 呎	911 萬 1295 呎
20/F	●	914 萬 1304 呎	939 萬 1308 呎	889 萬 1259 呎	909 萬 1295 呎
19/F	●	912 萬 1304 呎	937 萬 1308 呎	887 萬 1259 呎	907 萬 1295 呎
18/F	●	910 萬 1304 呎	935 萬 1308 呎	885 萬 1259 呎	905 萬 1295 呎

Case Study: Centa-City Index (Hong Kong)

- Centa–City Price Index – methods
  - For estate e, a hedonic price price model is estimated by using data from a chosen 12 months period

$$P_{i,e} = c_e + \sum_{i=1}^{k} \alpha_{i,e} S_i + \sum_{i=1}^{l} \beta_{i,e} N_i + \sum_{i=1}^{12} \gamma_{i,e} T_i + \varepsilon_e$$

  - A representative unit is determined by using the average value of S_i and N_i across all estates. Let's call them S_r and N_r
  - In each period t, all transactions are adjusted to have the same attributes S_r and N_r. This gives us the adjusted unit price for unit *i* in estate *e*.

$$P_{i,e}^{Adjusted} = P_{i,e} + \left(\sum_{i=1}^{k} \alpha_{i,e} (S_r - S_i) + \sum_{i=1}^{l} \beta_{i,e} (N_r - N_i) \right)$$

  - The adjusted prices are averaged across all estates (based on the total sellable area in each estate) to form the total market value. It is then compared to the same adjusted market value in the last period to calculate the index.

Case Study: Centa-City Index (Hong Kong)

- Centa–City Price Index – methods

Month 1: A small house was sold

Size = 100 squared metres
Age = 5 years old
Unit Price = 1000 HKD
Price index = 100

Month 2: A large house was sold

Size = 200 squared metres
Age = 1 years old
Unit Price = 3000 HKD
Price index = 3000/1000 ×100=300 (???)

Hedonic price model for this area: $\hat{P} = 500 + 20 \times Size - 100 \times Age$

Representative unit: size = 150, age = 3

Month 1: A small house was sold

The adjusted price is
1000 +(150-100) ×20+(3-5) ×(-100) = 1000 +
1000 + 200 = 2200HKD

Price index = 100

Month 2: A large house was sold

The adjusted price is
3000 +(150-200) ×20+(3-1) ×(-100) = 3000 -
1000 -300 = 1700 HKD

Price index = 1700/2200 × 100 = 77

Case Study: Centa-City Index (Hong Kong)

- Centa–City Price Index – methods
  - The average adjusted unit price for estate *e* with *m* units sold in period *t*

$$\overline{P_{e,t}^{Adjusted}} = \sum_{i=1}^{m} P_{i,e,t}^{Adjusted} / m$$

  - The index in this period is estimated as follows (W_e is determined based on total sellable area)

$$CCI_t = \frac{\sum_{e=1}^{E} \left(\overline{P_{e,t}^{Adjusted}} \cdot W_e \right)}{\sum_{e=1}^{E} \left(\overline{P_{e,t-1}^{Adjusted}} \cdot W_e \right)} \cdot CCI_{t-1}$$

  - Valuation of apartment *n* from estate *e* in period *t*

$$\widehat{P_{n,e,t}} = \overline{P_{e,t}^{Adjusted}} + \left(\sum_{i=1}^{k} \alpha_{i,e}(S_i - S_r) + \sum_{i=1}^{l} \beta_{i,e}(N_i - N_r) \right)$$

Case Study: Centa-City Index (Hong Kong)

- The methods are not complicated. Any one of us can do it with a one-day training session
- The index needs to be updated weekly. There is little room for errors.
- The index has been released weekly since 1999 with 18 estates. Now it has over 100 estates. The methods needs to be straightforward and robust enough for such adjustments.
- The index has been widely quoted as a reliable measurement of house prices in Hong Kong. A major HK bank closed its valuation department and used CCI valuations instead, because CCI valuations are more accurate and free.
- The key is the data. You cannot find such good data elsewhere.
- If you considering research topic for postgraduate dissertations, the technical aspects of hedonic price modelling is probably not a good idea. Focus on the applications instead.

Contingent valuation method

- Stated preference
- Willingness-to-pay (WTP), willingness-to-accept (WTA), and willingness-to-sell (WTS)
- Uses survey questionnaires or experiments to generate variables in an artificial environment: respondents are asked for monetary values they are willing to place on a good or service (WTP or WTA) or to transact (WTS).
- Widely used for the valuation of public goods, such as clean air acts and ocean protection schemes
- A tool for valuation of goods and services where open market prices are unavailable
- Caution: Politically correct answers; free-riders; lack of market information; …

Everybody Lies!

Contingent valuation method

- Schmidt, J. and T. H. A. Bijmolt (2019). "Accurately measuring willingness to pay for consumer goods: a meta-analysis of the hypothetical bias." *Journal of the Academy of Marketing Science*. 48: 499–518.
  - Hypothetical bias: the difference between the hypothetically measured WTP (HWTP) and real WTP (RWTP)
  - 77 studies in 47 papers; 115 effect sizes (pairs)
  - Selection criteria: both WTPs are reported, with mean and standard deviation
  - On average, the hypothetical bias is 21%
  - Indirect HWTA estimation methods overestimate RWTP significantly stronger than direct methods
  - The hypothetical bias is greater for higher valued products, specialty goods, and within-subject designs

Endowment effect

- Definition: Endowment effect is the difference between an individual's minimum willing-to-accept (WTA) to sell a product that he/she owns and the maximum willing-to-pay (WTP) to purchase the product. It is also called the WTA-WTP gap.
  - Richard Thaler coined this term in his 1980 paper: Thaler, R. (1980). "Toward a positive theory of consumer choice." *Journal of Economic Behavior & Organization* 1(1): 39-60.
  - Comprehensively tested in Kahneman, D., et al. (1990). "Experimental tests of the endowment effect and the Coase theorem." *Journal of Political Economy* 98(6): 1325-1348.

Endowment effect

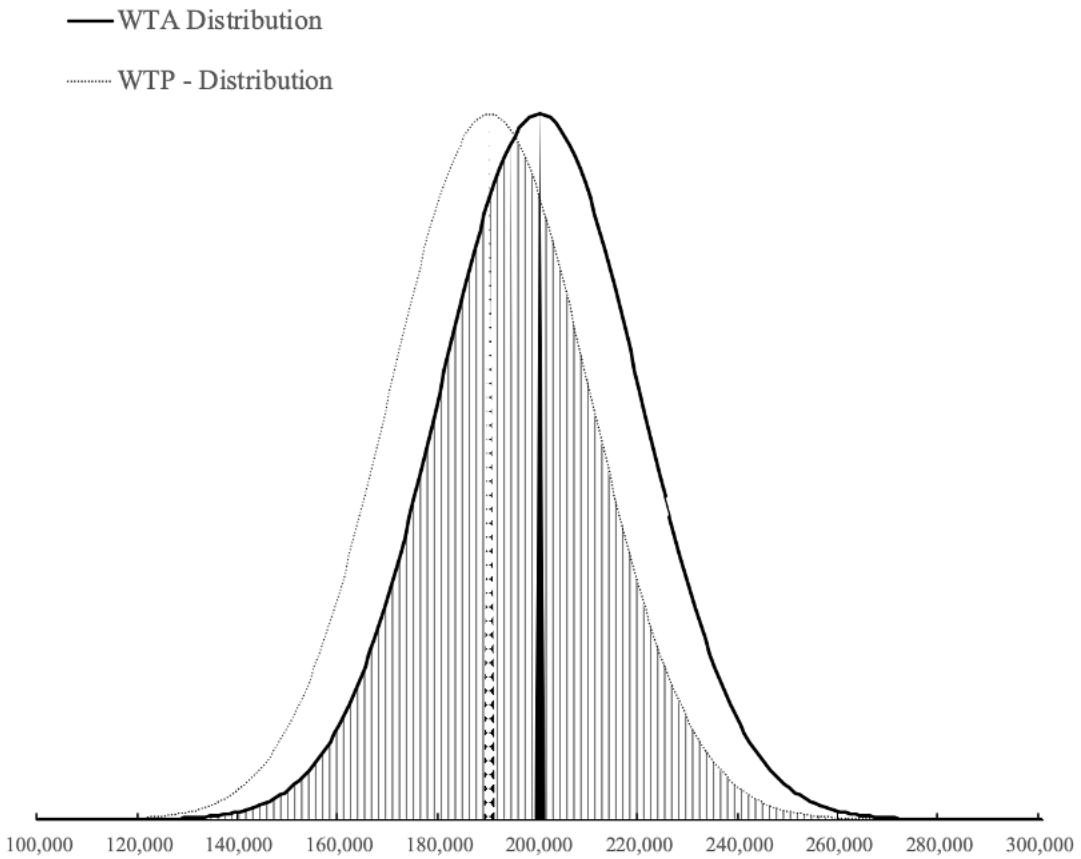


Figure 6.1A: $\overline{WTA} =$ £200,000; $\overline{WTP} =$ £190,000

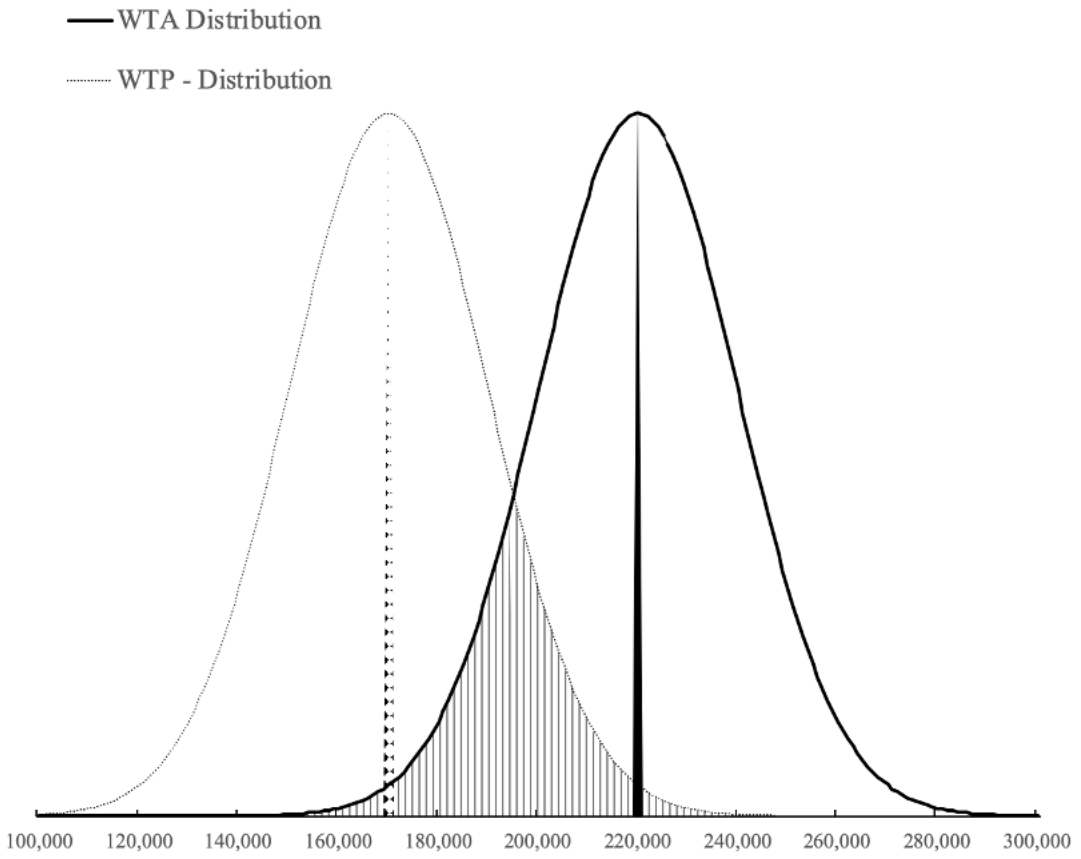


Figure 6.1B: $\overline{WTA} =$ £220,000; $\overline{WTP} =$ £170,000

Figure 6.1: WTA and WTP distribution

Endowment effect

- Kahneman, D., Knetsch, J. L., and Thaler, R. H. (1990). "Experimental tests of the endowment effect and the Coase theorem." *Journal of Political Economy* 98(6): 1325-1348.
  - Studied instant endowment effect: the value that an individual assigns to objects increase substantially as soon as ownership is established (previous studies investigated goods with much longer possessions only).
  - Large sample size: over 700 participants in multiple experiments.
  - Consumption goods: mug, pen, binoculars and chocolate bars
  - Introduced learning opportunity: repeated market trials, full feedback available at the end of each trial.
  - Conclusion: endowment effect and loss aversion are fundamental characteristics of preferences

Endowment effect

- Kahneman, D., Knetsch, J. L., and Thaler, R. H. (1990). "Experimental tests of the endowment effect and the Coase theorem." *Journal of Political Economy* 98(6): 1325-1348.

Experiment 1:

44 undergraduate students in an advanced law and economics class at Cornell University

CONSUMPTION GOODS MARKETS

Trial	Trades	Price	Median Buyer Reservation Price	Median Seller Reservation Price
		Mugs (Expected Trades = 11)		
4	4	4.25	2.75	5.25
5	1	4.75	2.25	5.25
6	2	4.50	2.25	5.25
7	2	4.25	2.25	5.25
		Pens (Expected Trades = 11)		
8	4	1.25	.75	2.50
9	5	1.25	.75	1.75
10	4	1.25	.75	2.25
11	5	1.25	.75	1.75

Endowment effect

- Field evidence:
  - List, J. A. (2003). "Does market experience eliminate market anomalies?" *Quarterly Journal of Economics* 118(1): 41-71.
  - List, J. A. (2004). "Substitutability, experience, and the value disparity: evidence from the marketplace." *Journal of Environmental Economics and Management* 47(3): 486-509.
  - List, J. A. (2011). "Does Market Experience Eliminate Market Anomalies? The Case of Exogenous Market Experience." *American Economic Review* 101(3): 313-317.
  - List (2003) and List (2004) treated market experience endogenously (i.e., participants decided on their own whether to trade repeatedly or not)
  - List (2011) introduced market experience exogenously (choose respondents with no experience in the first round, split them into two groups (NON-EXP and EXP), and 'train' the EXP group to be more experienced over future rounds).

Endowment effect

- List (2003, 2004, and 2011):
  - Two treatments: In treatment 1 a respondent is endowed with good A and has the option to trade it for good B. In treatment 2, a different respondent is endowed with good B and has the option to trade it for good A. Respondents are assigned to the two treatments randomly.
  - Null hypothesis: the ratio of exchange in the two treatments is 50% (no endowment effect)
  - Alternative hypothesis: the ratio of exchange in the two treatments is less than 50% (endowment effect)
  - Field experiment: Sportscard show and Disneyland
  - Well-functioning marketplace: large number of active traders, transparent and updated market information, low transaction costs.
  - Steps: (1) give a respondent A/B, (2) complete a survey, (3) show B/A and ask if trade, and (4) conclude the transaction and exit.

Selected Characteristics of Participants

	Sportscard market I		Pin market	Sportscard market II
	Dealers mean (std. dev.)	Nondealers mean (std. dev.)	Consumers mean (std. dev.)	Nondealers mean (std. dev.)
Trading experience	14.82	5.66	6.98	6.84
	(11.0)	(6.42)	(13.63)	(7.98)
Years of market experience	10.36	6.95	5.05	7.13
	(6.75)	(9.37)	(5.64)	(9.05)
Income	4.26	4.04	4.06	4.36
	(1.92)	(2.06)	(2.25)	(1.82)
Age	34.68	34.70	31.48	34.83
	(11.98)	(14.06)	(13.68)	(12.51)
Gender (percent male)	0.93	0.86	0.48	0.89
	(0.25)	(0.34)	(0.50)	(0.32)
Education	3.42	3.84	3.10	3.85
	(1.42)	(1.49)	(1.53)	(1.50)
Good B	0.527	0.527		—
	(0.50)	(0.50)		
Good D	—	—	0.50	—
			(0.50)	
Good F	—	—	—	0.53
				(0.50)
N	74	74	80	53

a. *Trading experience* represents the number of trades made in a typical month.
b. *Years of market experience* denotes years that the subject has been active in the market.
c. *Income* denotes categorical variable (1–8): 1) Less than $10,000, 2) $10,000 to $19,999, 3) $20,000 to $29,999, 4) $30,000 to $39,999, 5) $40,000 to $49,999, 6) $50,000 to $74,999, 7) $75,000 to $99,999, 8) $100,000 or over.
d. *Age* denotes actual age in years.
e. *Gender* denotes categorical variable: 0 if female, 1 if male.
f. *Education* denotes categorical variable 1) Eighth grade or less, 2) High School, 3) 2-Year College, 4) Other Post-High School, 5) 4-Year College, 6) Graduate School Education.
g. *Good B (D) (F)* denotes the subject's initial endowment, and =1 if the subject was endowed with *Good B (D) (F)*, 0 otherwise.

Summary Trading Statistics for Experiment I: Sportscard Show

Variable	Percent traded	*p*-value for Fisher's exact test
Pooled sample (n = 148)		
Good A for Good B	32.8	<0.001
Good B for Good A	34.6	
Dealers (n = 74)		
Good A for Good B	45.7	0.194
Good B for Good A	43.6	
Nondealers (n = 74)		
Good A for Good B	20.0	<0.001
Good B for Good A	25.6	

a. Good A is a Cal Ripken, Jr. game ticket stub, circa 1996. Good B is a Nolan Ryan certificate, circa 1990.
b. Fisher's exact test has a null hypothesis of no endowment effect.

Summary Trading Statistics for Experiment II: Pin Trading Station

Variable	Percent traded	*p*-value for Fisher's exact test
Pooled sample (n = 80)		
Good C for Good D	25.0	<0.001
Good D for Good C	32.5	
Inexperienced consumers (<7 trades monthly; n = 60)	25.0	<0.001
Experienced consumers (≥7 trades monthly; n = 20)	40.0	0.26
Inexperienced consumers (<5 trades monthly; n = 50)	18.0	<0.001
Experienced consumers (≥5 trades monthly; n = 30)	46.7	0.30

a. Good C is a cloisonné Valentine's Day pin portraying Mickey and Minnie Mouse, circa 2000. Good D is a cloisonné St Patrick's Day 2000 portraying Mickey Mouse, circa 2000.
b. Experienced consumers are those consumers who trade 7 (or 5) or more times per month (6.55 is the mean level of monthly trades). Inexperienced consumers trade less than 7 (or 5) times per month.
c. Fisher's exact test has a null hypothesis of no endowment effect.

- Out of the 148 participants in experiment 1, 108 agreed to meet John List in the next year's sportcards show. 72 eventually showed up: 53 nondealers and 19 dealers.
- An additional question to estimate the experience of nondealers (number of trades per month)

NONDEALER DATA SUMMARY FOR EXPERIMENT III: FOLLOW-UP SPORTSCARD SHOW

Variable	Percent traded	*p*-value for Fisher's exact test
Pooled sample (n = 53)		
Good E for Good F	40.0	<0.08
Good F for Good E	35.7	
Experienced consumers (n = 21)		
Good E for Good F	45.5	0.99
Good F for Good E	60.0	
Inexperienced consumers (n = 32)		
Good E for Good F	35.7	<0.02
Good F for Good E	22.2	

a. Good E is an autographed 5 × 8 photo of Byron "Mex" Johnson.
b. Good F is an official National League baseball autographed by Byron "Mex" Johnson.
c. Experienced consumers are those consumers who trade 7 or more times per month (6.84 is the average level of monthly trades). Inexperienced consumers trade less than 7 times per month.
d. Fisher's exact test has a null hypothesis of no endowment effect.

Endowment effect

- List, J. A. (2011). "Does Market Experience Eliminate Market Anomalies? The Case of Exogenous Market Experience." *American Economic Review* 101(3): 313-317.
- Endowment effect identified
- Market experience matters
- Question:
  - Does it apply to housing market?
  - Are there chances to practice?

TABLE 1—SUMMARY TRADING STATISTICS

Treatment	Percent traded	*z*-value for test of proportions
noexperience		
September	13.3 (4 of 30)	0.40
December	10.7 (3 of 28)	−2.13
February	20.7 (6 of 29)	−2.71
experience		
September	10.0 (3 of 30)	
December	34.5 (10 of 29)	
February	55.2 (16 of 29)	

Notes: Percent traded provides the percentage of subjects who traded their endowed good for the alternative in the experiment. Test of proportions has a null hypothesis of no treatment effect. For example, the first test measures the *noexperience* September trading rate against the *experience* September trading rate. A *z*-value of 0.40 suggests that the trading rates are not different at conventional levels.

Endowment effect – evidence from housing markets

- Bao, H. X. H. and C. M. Gong (2016). "Endowment effect and housing decisions." *International Journal of Strategic Property Management* 20(4): 341-353.
  - Field experiment
  - Conducted in May 2013 by the Institute of Statistical Survey (ISS) of Renmin University of China. A total of 20 interviewers were recruited and trained by ISS, and the interviews were carried out at 10 local branches of Centaline Real Estate Brokerage across the six main districts of Beijing.
  - Potential home sellers and buyers only
  - The interview lasted about 10 minutes on average
  - A total of 567 complete questionnaires were collected, with a response rate of 57%

Endowment effect – evidence from housing markets

- Bao, H. X. H. and C. M. Gong (2016). "Endowment effect and housing decisions." *International Journal of Strategic Property Management* 20(4): 341-353.

Table 3. Variable definition and descriptive statistics

Variables	Variable name	Definition	Mean	SD
Dependent variable	*BIAS*	The deviation of WTA/WTP from market benchmark of RMB 10,000 (1 USD = 6.12 RMB)	19.514	73.415
Endowment effect	D_p	= 1 if seller, and 0 otherwise	0.438	0.496
Market condition	*M*	= 1 if up market, and 0 otherwise	0.500	0.500
Buyer/seller characteristics	*HOME*	= 1 if not a homeowner, and 0 otherwise	0.316	0.465
	AGE	= 1 if under 30 years old, and 0 otherwise	0.409	0.492
	INCOME	= 1 if income > RMB 11,000, and 0 otherwise	0.147	0.355
	SPENDING	= 1 if monthly housing expenses is more than RMB 3,000, and 0 otherwise	0.253	0.435
	OCCP	= 1 if in fulltime employment in private sector, and 0 otherwise	0.511	0.500
	SYMBOL	= 1 if subjects regard homeownership as a symbol of success, and 0 otherwise	0.587	0.493
	IMPORTANCE	= 1 if subjects think homeownership is very important and 0 otherwise.	0.275	0.446
	RESIDENT	= 1 for permanent residents (i.e., registered residents who have been living in Beijing for at least three years), and 0 otherwise	0.871	0.335
	GENDER	= 1 if male, and 0 otherwise	0.538	0.499

Endowment effect – evidence from housing markets

- Bao, H. X. H. and C. M. Gong (2016). "Endowment effect and housing decisions." *International Journal of Strategic Property Management* 20(4): 341-353.

	Category	Model 1	Model 2	Model 3	
		Coefficient	Coefficient	Coefficient	VIF
C	Intercept	–5.529	–1.009	–17.462**	NA
D_p	Endowment effect	8.357*	–1.957	34.364***	6.845
MKT	Market condition	–10.614**	–19.653***	–19.653***	1.780
HOME	Experience	–10.092*	–10.092*	–6.562	2.021
AGE		15.083***	15.083***	18.615***	2.071
INCOME	Affordability	26.736***	26.736***	40.517***	2.203
SPENDING		11.183**	11.183**	18.787***	2.004
OCCP		8.796**	8.796**	18.197***	2.010
SYMBOL	Social and cultural values	9.617**	9.617**	14.365**	1.913
IMPORTANCE		13.846***	13.846***	20.451***	1.813
RESIDENT		–15.392**	–15.392**	–17.840**	1.572
GENDER		9.274**	9.274**	9.745*	1.890
*MKT** D_p	Interaction terms		20.628**	20.628**	2.780
*HOME** D_p				–9.982	1.471
*AGE** D_p				–11.237	2.643
*INCOME** D_p				–32.633**	2.456
*SPENDING** D_p				–12.925	2.421
*OCCP** D_p				–21.356**	3.168
*SYMBOL** D_p				–9.683	3.553
IMPORTANCE D_p				–18.869*	2.158
*RESIDENT** D_p				11.597	1.603
*GENDER** D_p				–2.123	3.139
Adj R^2		0.080	0.084	0.107	
F-statistic		8.547	8.351	6.121	

Note: ***p < 1%, **p < 5%, *p < 10.

Online Panel Data

- Online Panel (OP): An electronic database of registrants who have indicated a willingness to participate in future web-based research studies
- Online panel data (OPD): the data derived from an OP
- Online panel platform (OPP): the host that provides access to the OP. For example, Amazon Mechanical Turk and Qualtrics

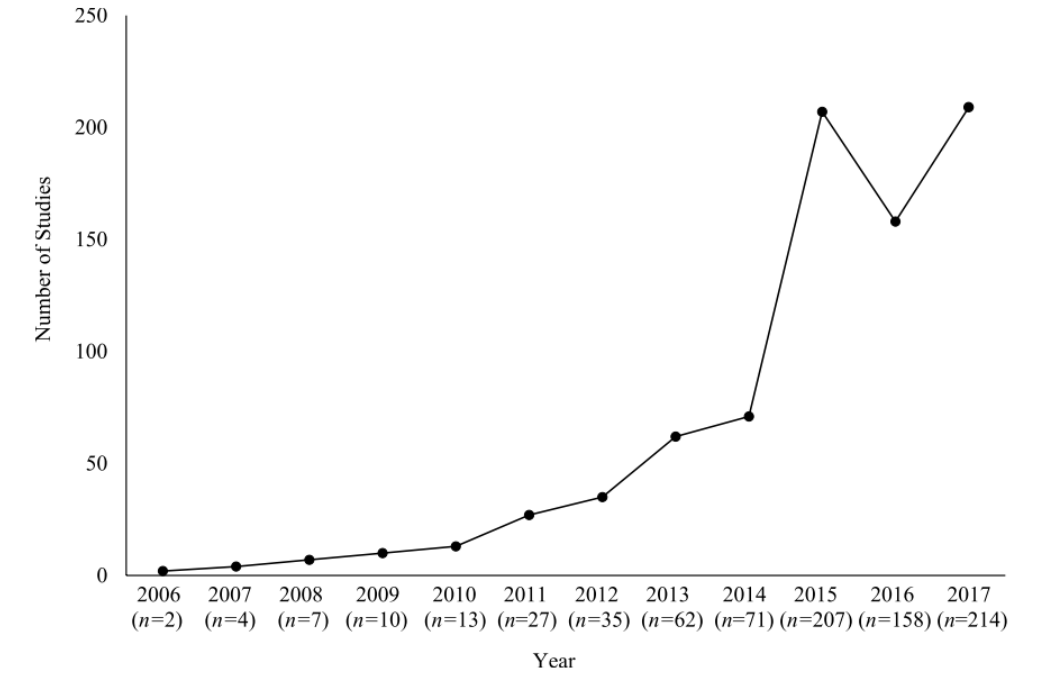
Online panel data

- Porter, C., et al. (2019). "The Use of Online Panel Data in Management Research: A Review and Recommendations." Journal of Management 45(1): 319-344.
  - A review of 804 OPD-based studies in 439 articles from 13 top management journals between 2006 and 2017
  - 26 online panel platforms (“brokers”) identified
  - Offer specific guidance to authors, reviewers, and editors
  - Facilitate a common understanding of OPD and its utility and providing recommendations regarding when and how to use OPD and how and where to publish it

Online panel data

- Porter, C., et al. (2019). "The Use of Online Panel Data in Management Research: A Review and Recommendations." Journal of Management 45(1): 319-344.

Figure 1
Online Panel Data Study Count by Year



OPP	Study Count (*n*)	Article Count (*k*)
MTurk	529	254
Qualtrics	44	32
StudyResponse	67	58
Zoomerang	10	10
Other public	52	27
Other private	5	1
Unspecified	97	57
Total	804	439

1. *Academy of Management Journal*
2. *Administrative Science Quarterly*
3. *Journal of Applied Psychology*
4. *Journal of International Business Studies*
5. *Journal of Management*
6. *Journal of Organizational Behavior*
7. *Leadership Quarterly*
8. *Management Science*
9. *Organizational Behavior and Human Decision Processes*
10. *Organization Science*
11. *Personnel Psychology*
12. *Strategic Entrepreneurship Journal*
13. *Strategic Management Journal*

Journal	Study Count (*n*)	Article Count (*k*)
AMJ	53	32
ASQ	12	9
JAP	131	93
JIBS	11	8
JOM	21	17
JOB	37	32
LQ	49	32
MS	61	26
OBHDP	362	138
OS	35	24
PP	25	22
SEJ	1	1
SMJ	6	5
Total	804	439

Online panel data

- Porter, C., et al. (2019). "The Use of Online Panel Data in Management Research: A Review and Recommendations." Journal of Management 45(1): 319-344.

Abbreviated Compilation of Best Practices

Recommendation by Topic
Topic 1: Recruitment and selection
1. Post a "HIT" more than once and be sure to spread those HITs out across different times of the day or even days of the week
2. Select only workers who have completed relatively few (e.g., 0–100) studies
3. When reputation information is available, restrict samples to "high-reputation" workers (e.g., >95% approval) and possibly larger number of completed studies
4. Make use of built-in and user-designed qualification features
5. Avoid qualification requirements not crucial to your research question
6. Include eligibility requirements clearly in your recruitment advertisement
7. Design presurveys that do not give away participation requirements
8. Describe research tasks generically at the outset
9. Initially provide some details of the experiment and approximately what participants will be doing
Topic 2: Study planning and design
10. Be aware of the existence of multiple OPPs and make use of those OPPs
11. Create unique completion codes that participants must submit to get paid
12. Be aware of and make use of third-party apps (e.g., TurkPrime) to help manage the research process
13. Increase your sample size to offset anticipated decreases in power
14. Avoid common experimental paradigms and psychological measures
15. Ensure study design consistency when combining samples
16. Temporally separate IVs and DVs when possible and/or appropriate
17. Use source separation for surveys when possible and/or appropriate
18. Avoid OPD for cross-cultural research in non-English-speaking countries or when unnecessary
19. Make use of OPD for cross-cultural research

Online Panel Data

- Concerns:
  - Lack of representativeness: Stritch, J. M., et al. (2017). "The Opportunities and Limitations of Using Mechanical Turk (MTURK) in Public Administration and Management Scholarship." *International Public Management Journal* 20(3): 489-511.
  - Non-naivety: Chandler, J., et al. (2014). "Nonnaivete among Amazon Mechanical Turk workers: Consequences and solutions for behavioral researchers." *Behavior Research Methods* 46(1): 112-130.
  - Sub-par data quality: Hauser, D. J. and N. Schwarz (2016). "Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants." *Behavior Research Methods* 48(1): 400-407.

Online Panel Data

- Guidelines:
  - Aguinis, H., et al. (2021). "MTurk Research: Review and Recommendations." *Journal of Management* 47(4): 823-837.
  - Buhrmester, M. D., et al. (2018). "An Evaluation of Amazon's Mechanical Turk, Its Rapid Rise, and Its Effective Use." *Perspectives on Psychological Science* 13(2): 149-154.
  - Goodman, J. K. and G. Paolacci (2017). "Crowdsourcing Consumer Research." *Journal of Consumer Research* 44(1): 196-210.
  - Peer, E., et al. (2017). "Beyond the Turk: Alternative platforms for crowdsourcing behavioral research." *Journal of Experimental Social Psychology* 70: 153-163.

Manage Batches > **Batch Details**

Transportation Preferences 3

View the latest status of this batch, make changes, or get results.

Let us know what your transport preferences are and if they have been affected by COVID-19

Status

Delete

Status: Pending Review

33% submitted | 100% published

Assignments Completed:	502 / 1,500	**Average Time per Assignment:**	26 minutes 6 seconds
Creation Time:	September 22, 2020 11:57 PM PDT	**Completion Time:**	October 05, 2020 12:24 AM PDT (Cancelled)

Settings

Transportation Preferences

View Project

Note: If you have edited the Project after publishing this Batch, you will see the latest version.

Description:	Let us know what your transport preferences are and if they have been affected by COVID-19
Keywords:	survey, demographics, transport, covid-19
Qualification Requirement(s):	Location is US-NY

Number of Assignments per task:	1500
Reward per Assignment:	$1.00

Batch expired on:	October 04, 2020 11:57 PM PDT
Assignment duration:	3 hours
Auto Approval Delay:	3 days

Results

Results

Assignments pending review:	0
Assignments approved:	502
Assignments rejected:	0

Cost Summary

Estimated Total Reward:	$1,500.00
Estimated Fees to Mechanical Turk:	$600.00 (fee details)
Estimated Total Cost:	$2,100.00

These costs are only an estimate until all of the assignments have been submitted and reviewed.

Setting up your survey

Reward per response $ 1.0

This is how much a Worker will be paid for completing your survey. Consider how long it will take a Worker to complete your survey.

Number of respondents 1500

How many unique Workers do you want to complete your survey?

Time allotted per Worker 3 Hours

Maximum time a Worker has to complete the survey. Be generous so that Workers are not rushed.

Survey expires in 7 Days

Maximum time your survey will be available to Workers on Mechanical Turk.

Auto-approve and pay Workers in 3 Days

This is the amount of time you have to reject a Worker's assignment after they submit the assignment.

Worker requirements

Require that Workers be Masters to do your tasks (Who are Mechanical Turk Masters?)

○ Yes ◉ No

Specify any additional qualifications Workers must meet to work on your tasks:

Location | is | NEW YORK (US-NY) Remove

(+) Add another criterion (up to 4 more)

(Premium Qualifications incur additional fees, see Pricing Details to learn more)

Project contains adult content (See details)

☐ This project may contain potentially explicit or offensive content, for example, nudity.

Task Visibility (What is task visibility?)

◉ Public - All Workers can see and preview my tasks

○ Private - All Workers can see my tasks, but only Workers that meet all Qualification requirements can preview my tasks

○ Hidden - Only Workers that meet my Qualification requirements can see and preview my tasks

Online Panel Data

- Aguinis, H., et al. (2021). "MTurk Research: Review and Recommendations." *Journal of Management* 47(4): 823-837.

Summary of Main Benefits of Using Amazon Mechanical Turk (MTurk) for Conducting Management Research

Benefit	Description of Benefit
1. Large and diverse participant pool[3,4,5,9,12,15,20]	1. MTurk allows researchers access to a larger and more demographically diverse participant pool as compared with traditional student samples and the U.S. population. Compared with traditional student samples, MTurkers are older, have more years of relevant work experience, and report greater computer and internet knowledge. Compared with the general U.S. population, MTurkers are younger and more educated. In addition, demographic and political-affiliation differences can be eliminated by controlling for 10 factors (i.e., age, gender, race, ethnicity, income, education, marital status, religion, ideology, and political partisanship). Thus, MTurk has the potential to complement laboratory studies by ensuring the transportability of results.
2. Ease of access and speed of data collection[6,7,11,13,16]	2. About 7,300 MTurkers are available for a study at any given time. By maintaining a relatively stable large online pool of participants, MTurk greatly reduces recruitment efforts, thereby making it easier to conduct, extend, reproduce, replicate, or modify a study. Most MTurk assignments are completed within 12 hours or less.
3. Reasonable cost[6,10,11,13,14]	3. Researchers can gather data at a lower cost than when using samples of students or working adults or using participants recruited through other online panel websites. MTurk's constant fee structure (i.e., the amount paid to Amazon to conduct a study) and integrated payment infrastructure reduces considerably the administrative costs associated with compensating participants.
4. Flexibility regarding research design choice[1,2,6,8,13,14,17,18,19]	4. MTurk can be used to implement experimental, passive observation, quasiexperimental, and longitudinal research designs and even perform tasks such as content analysis. Furthermore, MTurk can be used to conduct cross-cultural and international research by restricting the participant pool to workers with specific cultural backgrounds or to those who live in particular countries. Together, these benefits allow researchers to advance theory by testing hypotheses in diverse samples and about different types of effects and relations between variables (e.g., upward and downward, over time, dyadic).

Challenges of Amazon Mechanical Turk (MTurk) Research and Associated Validity Threats

Challenge	Description	Associated Validity Threat(s)
1. MTurker Inattention[3,8,9,12,13,18,21]	1. MTurkers often complete HITs in distracting environments and at rapid speed to maximize monetary returns, which translates into about 15% of MTurkers failing attention and compliance checks. MTurkers are less likely to pay attention to study instructions or manipulations, and more likely to engage in insufficient effort or careless responding, as compared with college student samples. Compared with student samples, online participants are significantly more likely to be distracted due to cell phone use (MTurker = 21% vs. student = 9%), internet surfing (MTurker = 11% vs. student = 1%), or conversing with another person (MTurker = 21% vs. student = 2%).	• Internal validity • Construct validity • Statistical conclusion validity
2. Self-misrepresentation[9,19,20,23,24]	2. MTurkers may misrepresent self-reported demographic, personality, and other characteristics to meet a study's eligibility criteria. Estimates of the percentage of MTurkers who engage in such practices range from 10% to 13%, to 24% to 83%. The most commonly misrepresented characteristics are income (38.2%), education (31.3%), age (22.6%), family status (14.8%), and gender (6.6%).	• External validity
3. Self-selection bias[12,13]	3. Unlike traditional samples, where the researcher defines the potential participant pool (e.g., first-line managers at a company), the decision to be an MTurker is based on an individual's personal and demographic characteristics, such as monetary incentives, boredom, employment status, or country location. These characteristics, which can serve as confounds and alternative explanations for observed relations, compromise the researchers' ability to randomly sample from their target population and therefore pose a threat to external validity.	• External validity
4. High attrition rates[2,9,12,25]	4. Attrition rates in MTurk studies often exceed 30% (range: 31.9%–51%). The online nature of MTurk studies leads to higher attrition rates than laboratory experiments or field research and even the possibility of differential attrition.	• Internal validity • External validity
5. Inconsistent English language fluency[15,18]	5. English language fluency influences how participants interpret the study's instructions, manipulations, and measures. Data from MTurkers from countries where English is not the primary language displays only configural invariance with data collected from undergraduates and organizational employees from countries where English is the primary language.	• Internal validity • Construct validity • Statistical conclusion validity
6. MTurker non-naivete[9,10,11,12]	6. While MTurk's software prevents participants from receiving compensation more than once for the same study, it does not track participant exposure to studies that examine particular topics or, even worse, use the exact same stimuli or manipulation. A small number of MTurkers (10%) account for over 40% of completed studies, and many participants "specialize" in studies that examine specific topics or are conducted by the same researchers. Accordingly, many MTurkers are familiar with experimental settings and tasks (e.g., framing alternatives for decision-making scenarios, using videos to manipulate emotions) and research materials (e.g., measures, vignettes), which can, on average, reduce effect size estimates by up to 40%.	• Internal validity • Construct validity
7. Growth of MTurker communities[7,10,12]	7. 61% of MTurkers interact with other participants regarding their experience. Thus, MTurkers are often aware of a study's purpose or the manipulations used.	• Internal validity • Construct validity
8. Vulnerability to web robots (or "bots")[8]	8. Web robots (or "bots") are malicious software programs designed to specifically participate in online studies to receive compensation. These programs, which are often freely available and easy to use, generate data that follow a random or partially random distribution in response to a study's questions, thereby making it harder to distinguish between web robots and inattentive or careless participants. While we currently lack estimates of the percentage of MTurk data attributable to web robots, such programs represent a feature that can impact research conducted using MTurk.	• Internal validity • Construct validity • Statistical conclusion validity
9. MTurker social desirability bias[1,5,12,22]	9. Because monetary compensation is one of the primary reasons for participating in a HIT, MTurkers are more likely to provide socially desirable responses than student samples. The percentage of respondents who engage in this practice varies across countries, with U.S. participants more likely to provide socially desirable responses compared with Indian participants.	• Internal validity • Construct validity
10. Perceived researcher unfairness[4,6,7,9,12,14,16,17]	10. In addition to concerns about the fairness of procedures used to make compensation decisions, issues that cause MTurkers to perceive researchers as unfair include a lack of a process to communicate with researchers, unavailability of disability access features, and inaccurately stated time requirements. Participants who feel treated unfairly can share their experiences in MTurker communities, leading to punitive actions, such as a boycott of subsequent studies by that researcher.	• External validity

Summary of Best-Practice Recommendations for Addressing Validity Threats in Research Using Amazon Mechanical Turk (MTurk)

Stage of Study	Recommendation	Implementation Guidelines	MTurk Challenge(s) Addressed (From Table 2)
Planning	1. Evaluate appropriateness of MTurk to develop or test theories	✓ Evaluating alignment between desired target population and that of MTurkers ✓ Collecting and reporting detailed sample characteristics rather than assuming similarity with earlier MTurk studies	• Self-selection bias
	2. Decide qualifications used to screen MTurkers	✓ Deciding qualifications (e.g., age, work experience, race) relevant to study ✓ Evaluating MTurkers using a screener study, paying everyone who participates, eliminating those who do not match the desired criteria, and inviting those who meet the qualifications/pass the screener to participate in the focal study ✓ Determining a priori whether to consider only MTurkers from native-English-speaking countries (based on their internet protocol [IP] addresses) or to establish measurement equivalence across native and non-native English speakers ✓ Deciding whether to use only highly qualified MTurkers (i.e., "Master Workers") or to employ screening questions to gauge MTurker familiarity with research subject, stimuli, and, if applicable, manipulations	• Self-misrepresentation • Inconsistent English language fluency • MTurker non-naivete
	3. Establish required sample size	✓ Planning to collect data from at least an additional 15% to 30% of MTurkers to compensate for participant attrition and failure to pass attention checks	• MTurker inattention
	4. Formulate compensation rules	✓ Paying U.S. minimum wage when drawing on U.S. samples ✓ Deciding a priori what criteria (if any) will be used to refuse payment to MTurkers ✓ Using a consent form, including details on compensation rules (i.e., codes of conduct, monitoring procedures, and penalties for fraudulent or untruthful reporting; see online supplement Appendix G for a customizable template)	• High attrition rates • Perceived researcher unfairness
	5. Design data collection tool used to gather responses	✓ Requiring MTurkers to complete an informed consent form, including a "CAPTCHA" verification to thwart web robots (or "bots) ✓ Requiring MTurkers to provide their MTurk ID and maintaining a reference database of past participants to identify MTurkers who attempt self-misrepresentation ✓ Using at least two attention checks (e.g., instructed items that direct MTurkers to complete or abstain from a particular action, bogus items that ask MTurkers to answer obvious or ridiculous questions, self-reports of effort, and questions on which all or almost all respondents should provide the same response) ✓ Including a qualitative open-ended question as an attention check ✓ Designing a short study (approximately 5 minutes) ✓ Avoiding using scales that have only "end" points labeled ✓ Repeating pertinent questions at the end of the study that make explicit the desired response and including a "Quit study" and "Contact researcher" option on each page	• MTurker inattention • Self-misrepresentation • Vulnerability to web robots (or "bots") • Perceived researcher unfairness

Stage of Study		Recommendation	Implementation Guidelines	MTurk Challenge Addressed (From Table 2)
	6.	Craft the MTurk task or Human Intelligence Task (HIT)	✓ Providing a detailed description that includes accurate estimated time commitment, what MTurkers will be asked to do, and compensation rules ✓ Avoiding cues that might provide MTurkers with signals about the study's aims or that might motivate MTurkers to engage in self-misrepresentation or exhibit greater social desirability bias (see online supplement Appendix H for a generic and customizable HIT post)	• Self-misrepresentation • MTurker social desirability bias
Implementation	7.	Launch the study, monitor responses, and respond to concerns	✓ Conducting a pilot test with a minimum of 10 to 30 participants that includes an open-ended question requesting feedback ✓ Monitoring MTurker communities to gauge MTurkers' reactions to the study ✓ Responding promptly to any questions or concerns raised by participants	• Growth of MTurker communities • Perceived researcher unfairness
	8.	Screen data	✓ Screening data in a timely manner using at least two or more tools (e.g., MTurker self-reports of response effort, answers to attention checks, response times, statistical tools that analyze answer-choice response patterns, IP addresses, and open-ended qualitative questions) to estimate likely percentage of unusable responses ✓ Adjusting number of participants to achieve desired sample size	• MTurker inattention • High attrition rates • Vulnerability to bots
	9.	Approve or deny compensation for completed responses	✓ Approving or denying compensation for completed responses within 24 to 48 hours of the MTurker completing the study ✓ Specifying the reason for rejecting compensation	• Perceived researcher unfairness
Reporting	10.	Report details to ensure transparency	✓ Reporting information regarding all procedures followed, decisions made, and results obtained during each stage of the study ✓ Providing all necessary data for future, secondary analyses (e.g., meta-analyses) of findings (i.e., demographics, means, standard deviations, and effect sizes) ✓ Reporting details regarding the posting of the HIT, qualifications used to restrict access to the HIT, and detailed sample characteristics ✓ Explaining all decisions regarding the use of attention checks and screening techniques, including the number of participants excluded for each, decisions regarding sampling from particular countries, measurement equivalence when testing non-native English speakers, and non-naivete ✓ Reporting detailed characteristics of the study, including information related to time commitment required and compensation provided	• MTurker inattention • High attrition rates • Inconsistent English language fluency • MTurker non-naivete • Perceived researcher unfairness

Online Panel Data

- Advantages:
  - Vast number of participants from across the globe, not just the WEIRD (Western, Educated, Industrialized, Rich, and Democratic)!
  - Low cost
  - Quick turnaround
  - Excellent platform for preliminary or pilot studies
- Limitations:
  - Non-naivety: ‘workers’.
  - Lack of representativeness: not everybody goes online
  - Sub-par data quality: lack of incentives to treat the survey seriously
  - …

My experience and observations

- Investigating Transportation Demand Management Strategies: The Case of Tradable Parking Permits
  - Platform: Amazon TurkPrime (Prime Panels Concierge Service) – we cannot use the standard MTurk because the 'workers' are primarily Americans (75%) and Indians (16%).
  - Pre-screening filters: Chinese residents, car-owners, living in high-rise apartments in 10 large cities that are known to have parking constraints
  - A free pilot run of 60 observations
  - Sample size: 500 (100 controls, 100 for each of the three social nudges, and 100 for robustness check)
  - Time to collect the sample: 7 days
  - Costs: $9 per complete questionnaire, $4,500 in total
  - Quality of data: Reasonable. A bot was overlooked by the platform!
  - Overall experience with the platform: Three Stars (not easy to use – too many emails; quality control concerns – a black box!)

My experience and observations

- **Investigating Transportation Demand Management Strategies: The Case of Tradable Parking Permits**

Table 1 Price sequences used in experiment (in RMB)

Sequence	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Average	Ave WTP	Sd WTP	Ave WTA	Sd WTA
1								60	80	80	73.3	83.2	21.4	69.1	8.8
2							80	60	80	100	80.0	92.0	32.1	74.7	14.0
3							80	100	80	60	80.0	83.7	13.0	69.0	11.7
4					80	60	70	80	100	90	80.0	89.2	10.7	73.9	11.1
5					80	100	90	80	60	70	80.0	85.3	10.5	70.6	10.5
6				70	90	110	90	80	90	100	90.0	97.5	41.3	81.4	12.0
7				70	90	110	90	100	90	80	90.0	92.2	11.3	77.1	10.7
8						80	100	80	60	60	76.0	80.9	13.0	66.2	10.2
9						80	80	80	80	60	76.0	76.9	9.8	66.5	9.9
10			70	80	110	80	70	70	70	70	77.5	84.7	13.6	71.1	7.4
11			70	80	80	80	80	80	80	80	78.8	81.1	6.2	74.7	7.3
12				80	50	80	60	80	100	80	75.7	88.1	36.7	68.6	12.6
13				80	50	80	70	80	90	80	75.7	82.9	8.5	68.8	11.8
14						100	80	80	80	80	84.0	85.9	9.9	78.2	9.5
15						100	100	80	60	80	84.0	88.1	9.6	73.0	11.1
16	84	80	80	80	80	80	80	80	80	80	80.4	82.5	8.4	78.4	6.6
17	84	80	60	80	84	84	84	84	84	80	80.4	84.0	9.3	73.6	10.1
18			100	90	80	80	80	80	80	80	83.8	85.9	8.7	79.2	7.0
19			100	90	80	90	90	80	60	80	83.8	88.5	8.2	74.1	11.0
20								60	60	80	66.7	79.0	9.4	67.9	9.5
21			80	60	80	100	100	100	100	80	87.5	90.9	10.3	74.9	12.5
22			80	100	80	60	60	60	60	80	72.5	84.8	11.1	68.8	10.7
23			80	100	100	100	100	80	60	80	87.5	90.5	9.5	75.5	12.7
24			80	60	60	60	60	80	100	80	72.5	85.5	38.5	69.1	10.4

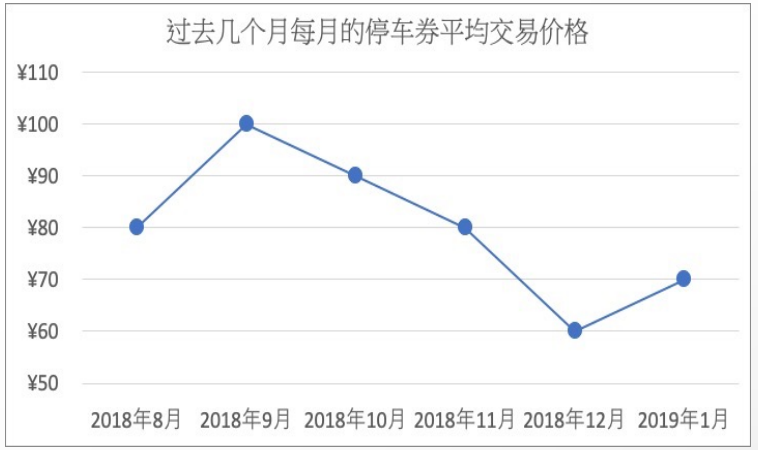


Table 2	Pair sequences for each factor		
Factor	Pairs of sequences		
Current price	2 and 3	4 and 5	6 and 7
Average price	1 and 20	21 and 22	23 and 24
Highest price	8 and 9	10 and 11	12 and 13
Lowest price	14 and 15	16 and 17	18 and 19

- The findings are consistent with existing evidence obtained through lab experiments with students.
- Helen X. H. Bao and Joelle Ng (2022). Tradable Parking Permits as a Transportation Demand Management Strategy: A Behavioural Investigation. Cities, Volume 120, Article ID: 103463.

My experience and observations

- Housing quality, residential satisfaction, and mental health: empirical evidence from China
  - Platform: Credamo.
  - Pre-screening filters: experience score, feedback score, cities, employed, computer interface
  - Sample size: 700
  - Time to collect the sample: 1 May – 17 June 2022
  - Costs: 10RMB per valid questionnaire
  - Quality of data: Good.
  - Extras: time taken to complete each question; many useful filters (cities/provinces and occupation types, etc.); allows follow-ups (i.e., interviewing respondents from previous rounds).
  - Overall experience with the platform: Four Stars (users are primarily students)

Quality control (1)可有效提高被试质量和问卷作答质量，限入门版及以上用户 (2)问卷发布后如何修改质量控制?

☐ The number of responses [Select] [Select]

*The total number of surveys answered by respondents. If you need less experienced respo

If need respondents with rich experience, you can choose 'greater than or equal to'.

☑ Respondents cre [大于等于] [80]

*样本信用分越高，填答问卷质量越高，但回收速度越慢。

推荐设置：大于等于 70或80

☑ Respondents historical adoption rate [大于等于] [80%]

*历史采纳率=被采纳问卷数/总填答问卷数。

推荐设置：大于等于 70或80

☐ Filter specified users

* Select the specified survey. This release will prohibit users who have answered the specified survey.

☑ 作答设备选择 ◉ 电脑端网页 ○ 手机网页+微信小程序 ○ 手机APP

*勾选后，被试只能通过特定设备作答。不勾选则支持所有设备作答。

☐ Answer area

*After checking, only one person is allowed to answer in this area.

☑ AI-powered Smart verfication

*Respondents need to perform smart verficationi before taking a survey, which improves data quality and security significantly, anyone of them.

◉ 滑动拼图

○ 文字点选

○ 图标点选

○ 空间推理

My experience and observations

- Descriptive Statistics – Mental Health (N = 700)

City	Anxiety	Depression	Stress	Overall	N
Beijing	9.72	10.61	11.37	31.71	156
Chongqing	9.71	9.76	11.71	31.19	21
Guangzhou	9.83	10.95	11.40	32.19	42
Shanghai	9.15	10.12	10.85	30.12	383
Shenzhen	10.31	12.50	13.50	36.31	16
Tianjin	9.29	9.58	10.97	29.84	31
Wuhan	9.53	10.90	11.98	32.41	51

- Descriptive Statistics – Housing Satisfaction & Housing Quality

City	Housing satisfaction (10 Items)	Building (5 Items)	Community (5 Items)	Schools (3 Items)	House (9 Items)	Open Space (4 Items)	Transportation (7 Items)	View (3 Items)
Beijing	4.56	0.75	0.68	0.34	0.76	0.63	0.38	0.16
Chongqing	5.05	0.80	0.68	0.38	0.73	0.61	0.34	0.19
Guangzhou	4.89	0.75	0.73	0.39	0.62	0.59	0.37	0.19
Shanghai	5.43	0.71	0.66	0.39	0.70	0.65	0.40	0.12
Shenzhen	4.45	0.73	0.69	0.33	0.65	0.50	0.39	0.13
Tianjin	5.10	0.66	0.74	0.48	0.75	0.58	0.41	0.17
Wuhan	4.49	0.80	0.68	0.28	0.69	0.51	0.38	0.15

My experience and observations

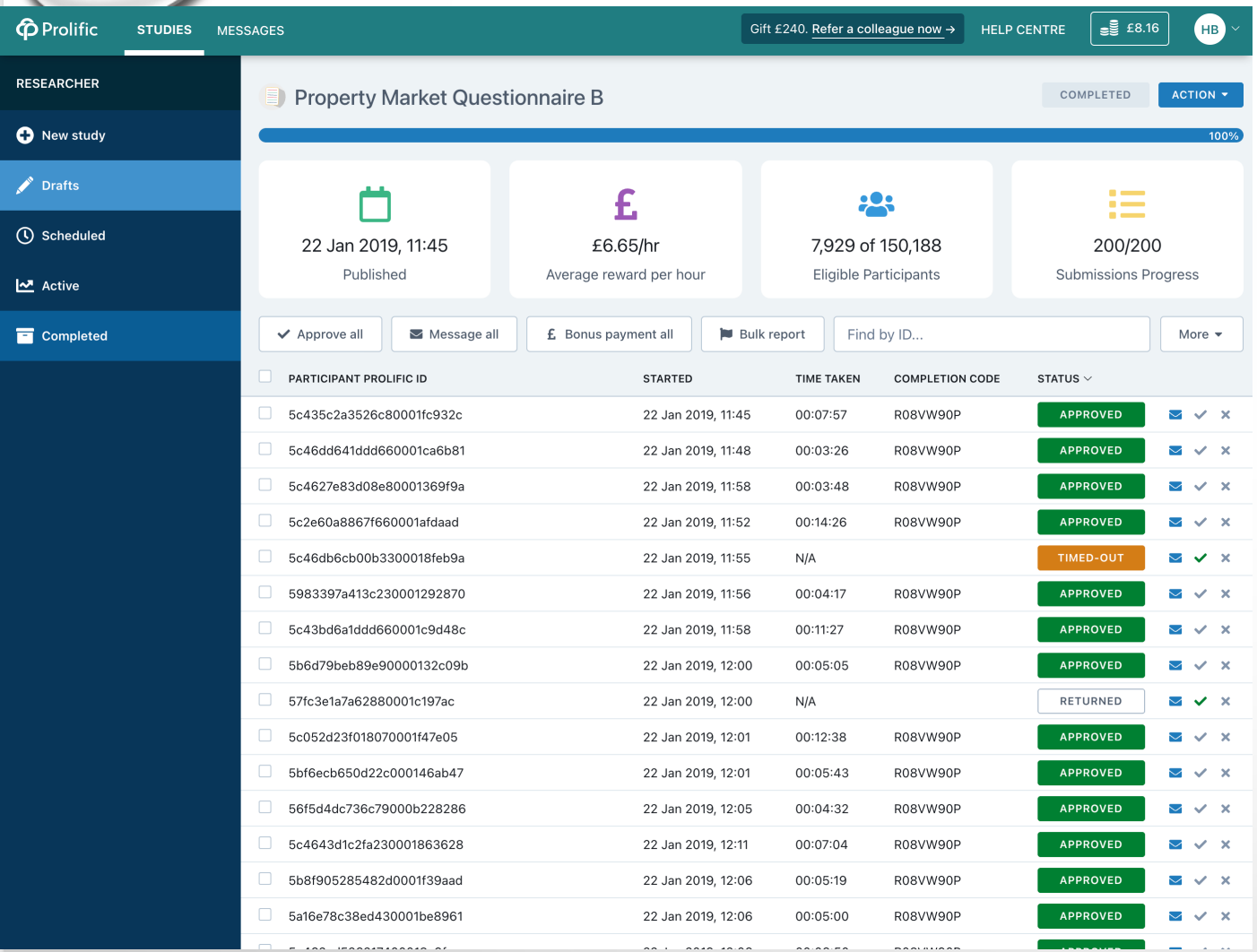
- Preliminary Analysis (dependent variables = mental health issues)

	Baseline Model				Model 1	Model 2	Model 3
	Anxiety	Depression	Stress	Overall			
Housing Satisfaction	-0.68***	-1.04***	-0.76***	-2.48***	-1.75***	-1.73***	-1.16***
Housing Quality	-0.04	-0.28*	-0.20	-0.52			
Building Quality					2.16	1.99	1.78
Community Quality					-0.68	-0.6	-0.69
Interior Quality					2.10	3.02	2.27
Open Space					-0.27	-0.48	-0.83
Transportation					3.24	3.66	2.89
View					-2.72*	-2.61*	-2.03
Building Issues					7.36***	7.48***	7.57***
Community Issues					6.37***	5.43***	5.31***
Long-term Health Issues						24.78***	24.03***
Lifestyle Score						-0.26*	-0.29**
Covid Effect							1.63***
Lockdown Length							0.03
R Square	0.20	0.26	0.18	0.24	0.29	0.30	0.32
F	3.84***	5.4***	3.35***	4.88***	5.34***	5.46***	5.75***

*Note: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$. Control variables are included in all models.*

Case Data and Experiment Design

- Research design: based on three publications, buyer and seller versions are separated
  - Baucells, M., Weber, M., Welfens, F., (2011), Reference-Point Formation and Updating. *Management Science*, 57, 506-519.
  - Paraschiv, C., & Chenavaz, R. (2011). Sellers' and buyers' reference point dynamics in the housing market. *Housing Studies*, 26(3), 329–352.
  - Bao, H. X. H., & Gong, C. M. (2016). Endowment effect and housing decisions. *International Journal of Strategic Property Management*, 20(4), 341–353.
- Platform: Prolific
- Pre-screening filters: UK residents, home-owners, renters
- Sample size: 400 (197 home-buyers and 203 home-sellers)
- Time to collect the sample: 3 hours
- Costs: £0.80 for the buyer questionnaire and £0.93 for the seller questionnaire


Prolific
STUDIES
MESSAGES
Gift £240. Refer a colleague now →
HELP CENTRE
£8.16
HB
RESEARCHER
New study
Drafts
Scheduled
Active
Completed
Property Market Questionnaire B
COMPLETED
ACTION
100%
22 Jan 2019, 11:45
Published
£6.65/hr
Average reward per hour
7,929 of 150,188
Eligible Participants
200/200
Submissions Progress
Approve all
Message all
£ Bonus payment all
Bulk report
Find by ID...
More
PARTICIPANT PROLIFIC ID
STARTED
TIME TAKEN
COMPLETION CODE
STATUS
5c435c2a3526c80001fc932c 22 Jan 2019, 11:45 00:07:57 R08VW90P APPROVED
5c46dd641ddd660001ca6b81 22 Jan 2019, 11:48 00:03:26 R08VW90P APPROVED
5c4627e83d08e80001369f9a 22 Jan 2019, 11:58 00:03:48 R08VW90P APPROVED
5c2e60a8867f660001afdaad 22 Jan 2019, 11:52 00:14:26 R08VW90P APPROVED
5c46db6cb00b3300018feb9a 22 Jan 2019, 11:55 N/A TIMED-OUT
5983397a413c230001292870 22 Jan 2019, 11:56 00:04:17 R08VW90P APPROVED
5c43bd6a1ddd660001c9d48c 22 Jan 2019, 11:58 00:11:27 R08VW90P APPROVED
5b6d79beb89e90000132c09b 22 Jan 2019, 12:00 00:05:05 R08VW90P APPROVED
57fc3e1a7a62880001c197ac 22 Jan 2019, 12:00 N/A RETURNED
5c052d23f018070001f47e05 22 Jan 2019, 12:01 00:12:38 R08VW90P APPROVED
5bf6ecb650d22c000146ab47 22 Jan 2019, 12:01 00:05:43 R08VW90P APPROVED
56f5d4dc736c79000b228286 22 Jan 2019, 12:05 00:04:32 R08VW90P APPROVED
5c4643d1c2fa230001863628 22 Jan 2019, 12:11 00:07:04 R08VW90P APPROVED
5b8f905285482d0001f39aad 22 Jan 2019, 12:06 00:05:19 R08VW90P APPROVED
5a16e78c38ed430001be8961 22 Jan 2019, 12:06 00:05:00 R08VW90P APPROVED

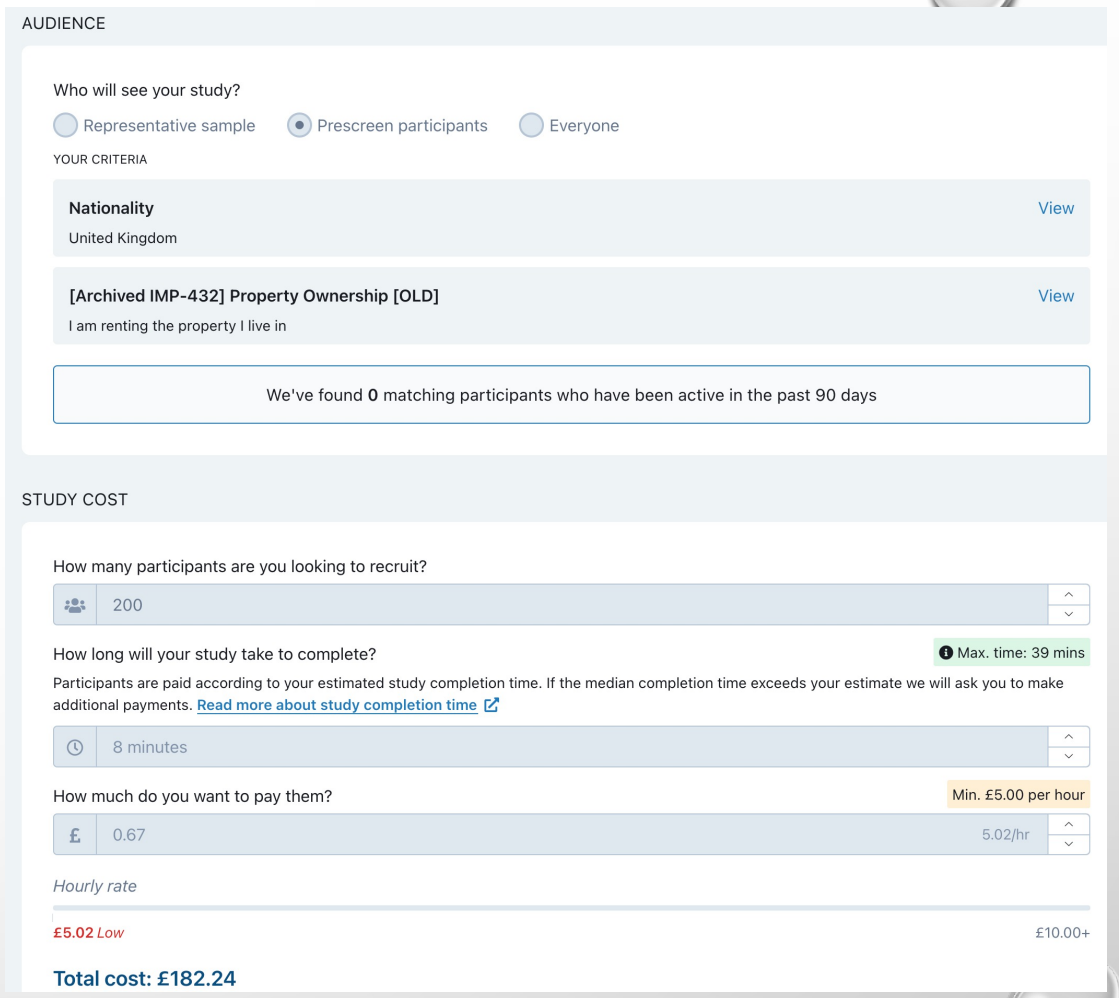

AUDIENCE
Who will see your study?
Representative sample
Prescreen participants
Everyone
YOUR CRITERIA
Nationality
View
United Kingdom
[Archived IMP-432] Property Ownership [OLD]
View
I am renting the property I live in
We've found 0 matching participants who have been active in the past 90 days
STUDY COST
How many participants are you looking to recruit?
200
How long will your study take to complete?
Max. time: 39 mins
Participants are paid according to your estimated study completion time. If the median completion time exceeds your estimate we will ask you to make additional payments. Read more about study completion time
8 minutes
How much do you want to pay them?
Min. £5.00 per hour
£
0.67
5.02/hr
Hourly rate
£5.02 Low
£10.00+
Total cost: £182.24

Table 6.1: Questionnaire design

Question	Label	Market Trend	Price Info
1	Average Market Price	Declining	Similar properties trade between £250,000 - £350,000
2	Initial Purchase Price	Declining	Four years ago, the property was bought for £400,000
3	Intermediate Price	Declining	Two years ago, the property was worth £350,000
4	Alternative Offer Price	Declining	A similar property has just sold for £250,000 (buyer) Another potential buyer is willing to pay £250,000 (seller)
5	Average Market Price	Growing	Similar properties trade between £450,000 - £550,000
6	Initial Purchase Price	Growing	Four years ago, the property was bought for £400,000
7	Intermediate Price	Growing	Two years ago, the property was worth £450,000
8	Alternative Offer Price	Growing	A similar property has just sold for £550,000 (buyer) Another potential buyer is willing to pay £550,000 (seller)

Note: The seller questionnaire asked for the minimum price a respondent would sell the property for. The buyer questionnaire asked for the maximum price a respondent would pay for the property. The buyer questionnaire asked the same questions as the seller questionnaire, with wording changed slightly to represent a buyer decision.

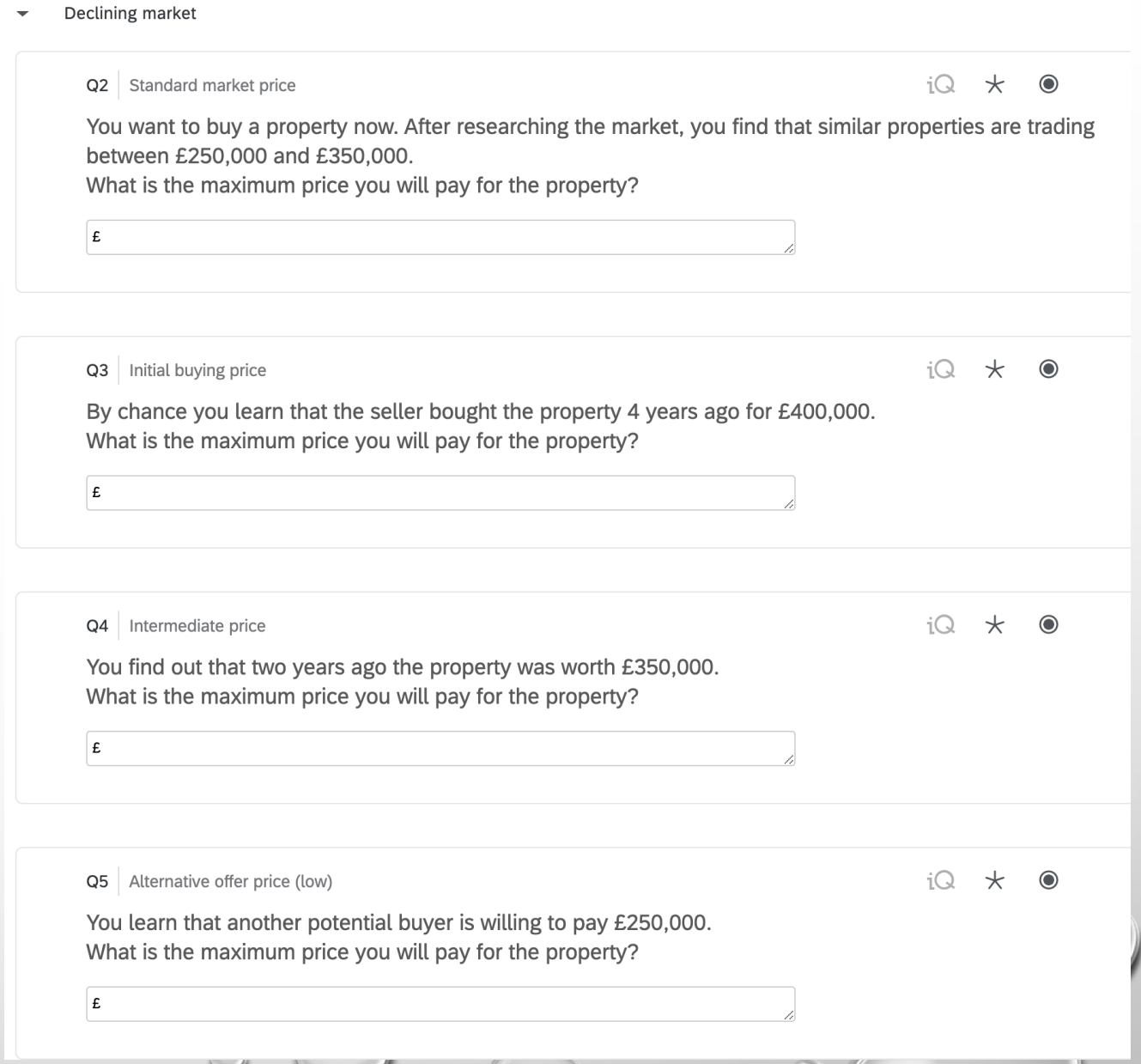


Table 6.2: Variable definition and descriptive statistics

Variable	Definition	Sellers	Buyers
Age	Age in years		
Less than 25 years old (AGE1)		2%	3%
25 - 35 years old (AGE2)		31%	35%
36 - 50 years old (AGE3)		40%	38%
51 - 65 years old (AGE4)		22%	20%
More than 65 years old		5%	4%
Gender	= 1 if male, 0 otherwise		
Female		75%	73%
Male (MALE)		25%	27%
Education	Highest education attainment		
Secondary school (EDU1)		11%	10%
Sixth form college (EDU2)		26%	22%
Undergraduate degree (EDU3)		42%	47%
Postgraduate and/or PhD (EDU4)		19%	20%
Others		2%	1%
Income	Average monthly income (£)		
Less than £500 (INCOME1)		11%	9%
Between £500 - £999 (INCOME2)		17%	15%
Between £1000 - £1999 (INCOME3)		43%	42%
Between £2000 - £3000 (INCOME4)		21%	24%
More than £3000		8%	10%
Housing expenditure	Average monthly housing expenditure (£)		
Less than £500 (HEXP1)		57%	55%
Between £500 - £999 (HEXP2)		39%	37%
Between £1000 -£1500 (HEXP3)		2%	5%
More than £1500		2%	3%
Sample size		155	164

Findings and conclusions

$$PRICE = \beta_0 + \beta_1 SELLER + \beta_2 SBUST + \beta_3 INI + \beta_4 INTER + \beta_5 AO + \beta_6 BUDT + \beta_7 AGE1 + \beta_8 AGE2 + \beta_9 AGE3 + \beta_{10} AGE4 + \beta_{11} MALE + \beta_{12} EDU1 + \beta_{13} EDU2 + \beta_{14} EDU3 + \beta_{15} EDU4 + \beta_{15} INCOME1 + \beta_{16} INCOME2 + \beta_{17} INCOME3 + \beta_{18} INCOME4 + \beta_{19} HEXP1 + \beta_{20} HEXP2 + \beta_{21} HEXP3$$

- PRICE: Reported WTP/WTA
- SELLER: = 1 if seller
- BUST: = 1 if down market
- SBUST = SELLER * BUST
- INI: Initial purchase price
- INTER: Intermediate price
- AO: Alternative offer

Table 6.3: Regression results

Variable	Model 1 LN(PRICE)		Model 2 LN(PRICE)		Model 3 PRICE		Model 4 PRICE	
	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
INTERCEPT	13.12	<.01	13.17	<.01	500725	<.01	518326	<.01
SELLER	<-.01	0.88	<-.01	0.83	-328	0.91	-137	0.96
SBUST	0.05	<.01	0.05	<.01	18488	<.01	18488	<.01
INI	0.05	<.01	0.05	<.01	11326	<.01	11326	<.01
INTER	0.04	<.01	0.04	<.01	8802	<.01	8802	<.01
AO	<.01	0.74	<.01	0.74	5140	0.06	5140	0.06
BUST	-0.44	<.01	-0.44	<.01	-172153	<.01	-172153	<.01
AGE1	-0.03	0.15	-0.03	0.17	-8897	0.22	-8221	0.26
AGE2	-0.02	0.05	-0.03	0.03	-9029	0.05	-10225	0.03
AGE3	-0.01	0.34	-0.01	0.25	-4036	0.37	-4903	0.28
AGE4	-0.02	0.08	-0.03	0.04	-8581	0.07	-10151	0.03
MALE	-0.02	<.01	-0.02	0.01	-5791	0.01	-5623	0.01
EDU1			-0.03	0.26			-11875	0.20
EDU2			-0.04	0.14			-15616	0.08
EDU3			-0.03	0.27			-12158	0.17
EDU4			-0.02	0.52			-8010	0.38
INCOME1	-0.03	0.01	-0.03	0.04	-13434	<.01	-11717	0.02
INCOME2	-0.05	<.01	-0.04	<.01	-19953	<.01	-17705	<.01
INCOME3	-0.04	<.01	-0.03	0.01	-15471	<.01	-13312	<.01
INCOME4	-0.04	<.01	-0.03	0.01	-14405	<.01	-13499	<.01
HEXP1			-0.02	0.21			-7114	0.32
HEXP2			-0.02	0.27			-6176	0.39
HEXP3			-0.01	0.66			-743	0.93
R-Square	0.7293		0.7305		0.7391		0.7305	
Adj R-Sq	0.7277		0.7281		0.7376		0.7281	

Findings and conclusions

- Is there endowment effect in the UK housing market?
  - If we look at the coefficient estimate of SELLER only, the answer is no
  - However, this is not the complete picture, as the coefficient estimate of SBUST is significant
- Does endowment effect change with market condition?
  - The coefficient estimate of SBUST > 0 in all models
  - SBUST=1 only when both BUST= 1 and SELLER=1
  - Seller's WTA is 5% or £18,488 higher than buyer's WTP in a down market
  - Endowment effect is caused by loss aversion
  - When the market is booming, or being in the gain domain, sellers are able to overcome this psychological bias

Conclusions

- A replication of Paraschiv, C., & Chenavaz, R. (2011)
- Endowment effect is identified in down market among UK homeowners
- Results are consistent with evidences collected by conventional online survey and field experiment (i.e., Baucells, M., Weber, M., Welfens, F., (2011), Paraschiv, C., & Chenavaz, R. (2011), and Bao, H. X. H., & Gong, C. M. (2016)
- Prolific is a reliable and efficient platform to collect data
- Helen X. H. Bao and Rufus Saunders (2021). Reference Dependence in the UK Housing Market. *Housing Studies*, forthcoming. https://doi.org/10.1080/02673037.2021.1935767.

Practical session

- If you have not used any OPD before, open one of the three OPD provider website and register as a worker and browse the HITs (human intelligence tasks) available to you. You may need to wait for several hours for the account to be ready.
  - www.mturk.com
  - www.prolific.co
  - www.credamo.com
- Will renters be affected by endowment effect more or less? Think about a research design to answer this question. You may find this article useful: Helen X. H. Bao and Rufus Saunders (2021). Reference Dependence in the UK Housing Market. *Housing Studies*.
- How about investors in housing markets? Is there a difference between first-time buyers and buy-to-let investors? Outline a research plan to answer this question.
- Think about other ways to improve the data and analysis in this case study.

Summary

- Research questions
- House price estimation
- Endowment effect
- Data and methods (Online panel data)
- Findings and discussions
- Future research directions