Loss Aversion and Focal Point Bias: Empirical Evidence

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Abstract

Both loss aversion and focal point bias can involve anchoring either to a previous price or to salient left digits or round numbers. We estimate a strong positive relationship between an estimated loss aversion parameter and reporting round numbers using data from an earlier experiment. Then, we show positive effects of expected losses on housing sales prices. We find that the effects of facing a loss on the eventual sales price are larger for sellers who selected a round mortgage amount during their initial purchase, and further show that selecting round mortgage amounts is persistent within borrowers over time.

Motivation

Evidence that behavior biases arise together
- Stango et al. (2017), Pagel (2018), Dean and Ortoleva (2019), Stango and Zinman (2020)

Loss aversion
- Overweighting losses or unwillingness to realize a loss
- Prospect theory

Focal point bias (or round number bias)
- Focus on the left digit or round numbers
- bounded rationality

Link between loss aversion & focal point bias
- Gabaix (2018): loss aversion and focal point bias can be explained by anchoring & limited attention
- Pagel (2018): news-utility preferences (inattention) → loss aversion
- Fraser-Mackenzie et al. (2015): more focal point bias after experiencing losses

Experimental Evidence

Karle et al. (2015) study the effect of loss aversion on consumption
- Individuals to report preferences between two sandwiches
- Prices of the two sandwiches are randomized so that some buyers face a loss
- Loss aversion measured by individual's choices across a series of lotteries and sure pay-offs
- Individuals also asked how much they typically spend for lunch

We re-examine their data using their loss aversion measure.

We divide the sample based on whether individual reports spending an integer or fractional number of Euros on lunch.

Key findings: Individuals who rounded when responding to a survey question exhibited higher levels of loss aversion during the experiment, even after controlling for risk aversion.

Dependent Variable: estimated loss aversion parameter

	Full Sample	Drop 10 & 15	Drop >=7
A. No Controls	(1)	(2)	(3)
Rounded Reporting	1.786**	1.447**	1.530**
	(0.783)	(0.688)	(0.724)
Risk Aversion Estimate	7.270***	5.891***	6.222***
	(2.544)	(2.216)	(2.346)
R-squared	0.146	0.131	0.139
Observations	124	122	118
B. With Controls	(4) (5)	(6) (7)	(8) (9)
Rounded Reporting	1.907** 1.541	1.559* 2.175*	1.693* 2.200*
	(0.924) (1.192)	(0.849) (1.223)	(0.901) (1.258)
Risk Aversion Estimate	7.410*** 7.113***	5.948** 5.997**	6.421** 6.242**
	(2.778) (2.653)	(2.429) (2.383)	(2.614) (2.451)
Controls	A A+B	A A+B	A A+B
R-squared	0.142 0.151	0.130 0.165	0.142 0.169
Observations	119 119	117 117	114 114

Controls A include Age, Gender, Semester, Work Income (log).
Controls B include Number of Lunches Out per Week, Self-Reported Cost of Lunch.

Housing Market Evidence

Stacked Regression Discontinuity Design (RDD)

$$P_{icst} = \beta_1 Loss_{icst} + \beta_2 Loss_{icst} * Round_{ics} + \gamma_1 Run_{icsb} + \gamma_2 Loss_{icst} * Run_{icsb}$$
$$+\gamma_3 Run_{icsb} * Above_{icsb} + \gamma_4 Loss_{icst} * Run_{icsb} * Above_{icsb}$$
$$+\gamma_5 Above_{icsb} + \boldsymbol{\delta_R} \boldsymbol{X}_{icst} + \varphi_b + \theta_{ct} + \varepsilon_{icst}$$

- Outcome: whether next mortgage round / log sale price / sale probability
- Unit of observation for sales price: seller i in the quarter of purchase s, the quarter of sale t, and labor market area c
- Round*Loss captures the differential effect of expected losses for individuals precisely at the round number of discontinuity
- Run*Loss allows expected loss effects to vary with mortgage amount
- φ_b = fixed effects for each stacked mortgage amount window
- θ_{ct} = LMA-by-year-by-quarter fixed effects
- multi-way clustering of SE by mortgage bin, by area by year by quarter, and by census tract

Sample: 548,568 single-family residential sales between Jan 1994 and Dec 2017 in 6 labor market areas (LMAs) in Connecticut → 139,674 repeat sales dropping non-Arms length sales, square footage changes of 5% or more, and second sales before 1999

Key Findings:
- Persistent focal point bias: more likely to select round mortgage next time
- Among individuals who exhibit focal point bias: larger loss aversion effects on housing sales prices
- Among individuals who exhibit focal point bias: larger loss aversion effects on sale likelihood
- The previously documented loss aversion effects are strongly correlated with housing, mortgage, and location attributes
  - loss aversion may be less important than previously believed for explaining the operation of the housing market during market downturns

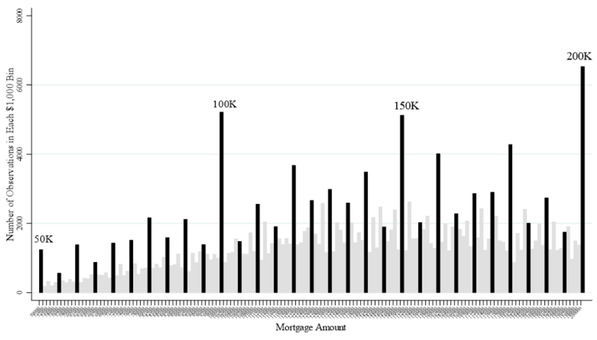

Figure 1. Mortgage Amount Histograms ($50K-$200K)

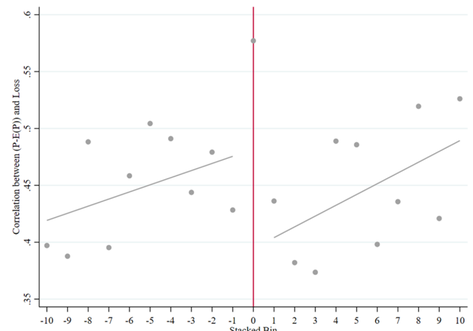

Figure 2. Correlation between Sales Price Premium and Expected Loss at Round Numbers

	Round Next Mortgage	Sale Price	Sale Price	Sale Hazard	Sale Hazard
		Loss	w/ Gain	Loss	w/ Gain
	(1)	(2)	(3)	(4)	(5)
A. Baseline					
Round Mortgage (Previous)	0.112***				
	(0.036)				
Loss		0.166***	0.142***	0.001	-0.016
		(0.036)	(0.040)	(0.009)	(0.012)
Loss*Round Mortgage (Previous)		0.114***	0.106***	-0.020***	-0.024***
		(0.032)	(0.035)	(0.007)	(0.008)
B. Baseline + balance control (and interactions)					
Round Mortgage (Previous)	0.111***				
	(0.036)				
Loss		0.134***	0.158***	0.001	-0.015
		(0.028)	(0.031)	(0.009)	(0.012)
Loss*Round Mortgage (Previous)		0.109***	0.102***	-0.021***	-0.026***
		(0.027)	(0.030)	(0.007)	(0.008)
C. Baseline + balance control (and interactions) + tract (or tract-by-type) FEs					
Round Mortgage (Previous)	0.121***				
	(0.039)				
Loss		0.102***	0.119***	0.002	-0.015
		(0.023)	(0.026)	(0.010)	(0.013)
Loss*Round Mortgage (Previous)		0.121***	0.112***	-0.028***	-0.032***
		(0.026)	(0.027)	(0.008)	(0.009)
Observations	14,413	50,959	50,959	312,559	312,559

Conclusions

We provide evidence that loss aversion is stronger among buyers who exhibited focal point bias by reporting or selecting round numbers. First, we use data from an experiment to establish that individuals who rounded when responding to a survey question exhibited higher levels of loss aversion during the experiment, even after controlling for risk aversion. We next exploit an observed discontinuity in the relationship between expected loss and sales prices to document larger effects of expected loss for sellers who selected a round mortgage amount during their initial purchase. These sales price effect differentials for the focal point sample are relatively stable to the inclusion of controls. We also find that the likelihood of sale falls for the focal point sample relative to the continuous mortgage amount sample when the owner faces expected losses.