Does Economic Insecurity Affect Employee Innovation?

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Summary

- Motivation: Does employee innovation respond to background economic stress?
- Paper argues yes:
  - Among workers at same firm: those exposed to house price declines (zip-level variation) produce fewer, worse patents
- My comments:
  - Good use of home price variation
  - I suggest two tests to tease out some alternate mechanisms

Background: Supply and Demand for Innovation

- Much of innovation literature: firm is site of innovation, responds to supply-side incentives
  - Howell 2017 (R&D subsidy), Seru 2014 (corporate form), Bernstein 2015 (public)
- Here: individuals innovate, and respond to demand (wealth)
- Why separate channels?
  - Different policy prescriptions
    - Sraer, Thesmar, Schoar, Hombert 2017, UI
    - Chetty et al. 2017, Aghion et al. 2017, innovation exposure
  - Role of demand-side would indicate a propagation mechanism for business cycles

Assessing the Role of Housing

- Is it important that the shock come through housing?
  - What would be different if authors had stock data?
  - How exogenous are home price shocks?
- My view: **Home price shocks are simply a good proxy for broader wealth channel**
- So you should see the same results with stocks. But:
  - Housing is 50% of net worth among owners; no complicating own-company equity ownership; and well-measured shocks
- Alternate stories on home price variation:
  - Controlled for (ie, incomes are fixed at company)
  - Or reflect some other demand side story
  - House price shocks pick up this demand-side variation

Suggestion 1: Renters?

- Obvious control group: people with $\{Apt, No., \#, etc.\}$ in their address
- If difficult to parse: same-zip inventors who fail to match
- Authors have 52% match (home ownership: about 2/3)
- Showing that home price changes affect owners, not renters, would establish a mechanism through housing wealth

Main Results

	Log(Number of Patents Post)		Log(Citations Per Patent Post)	
	(1)	(2)	(3)	(4)
%Δ House Price Post	0.218***	0.219***	0.172***	0.172***
	(0.0317)	(0.0316)	(0.0240)	(0.0239)
%Δ House Price Pre		-0.0310		0.00866
		(0.0523)		(0.0432)
Pre-2008 Measure	0.789***	0.789***	0.212***	0.212***
	(0.0205)	(0.0205)	(0.00895)	(0.00896)
Firm × CBSA FE	Yes	Yes	Yes	Yes
R^2	0.290	0.290	0.048	0.048
Observations	162,011	162,011	162,011	162,011

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Bottom decile of home price appreciation → 6–10% drop in patent productivity relative to the top

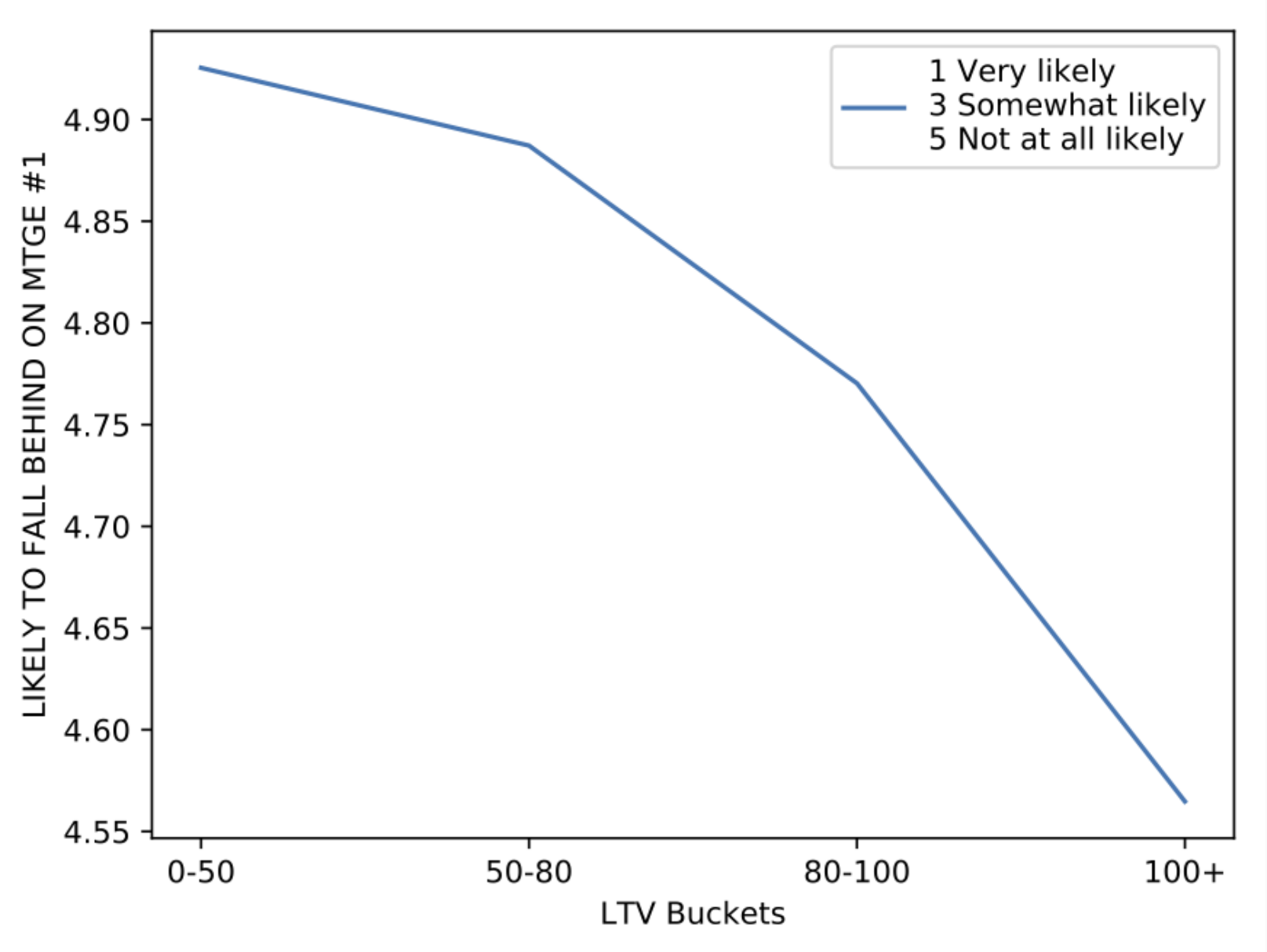
How Should Homeowners Respond to Home Price Declines?

1. Default costs in event of job loss (double-trigger, this paper)
2. Housing lock; difficult to move
3. Precautionary savings: reduce consumption, raise savings
4. Unable to refinance and lower monthly payments
5. Expect higher labor supply (depends on labor supply elasticity)
6. Tightening of collateral constraints: more difficult to smooth idiosyncratic shocks through equity extraction

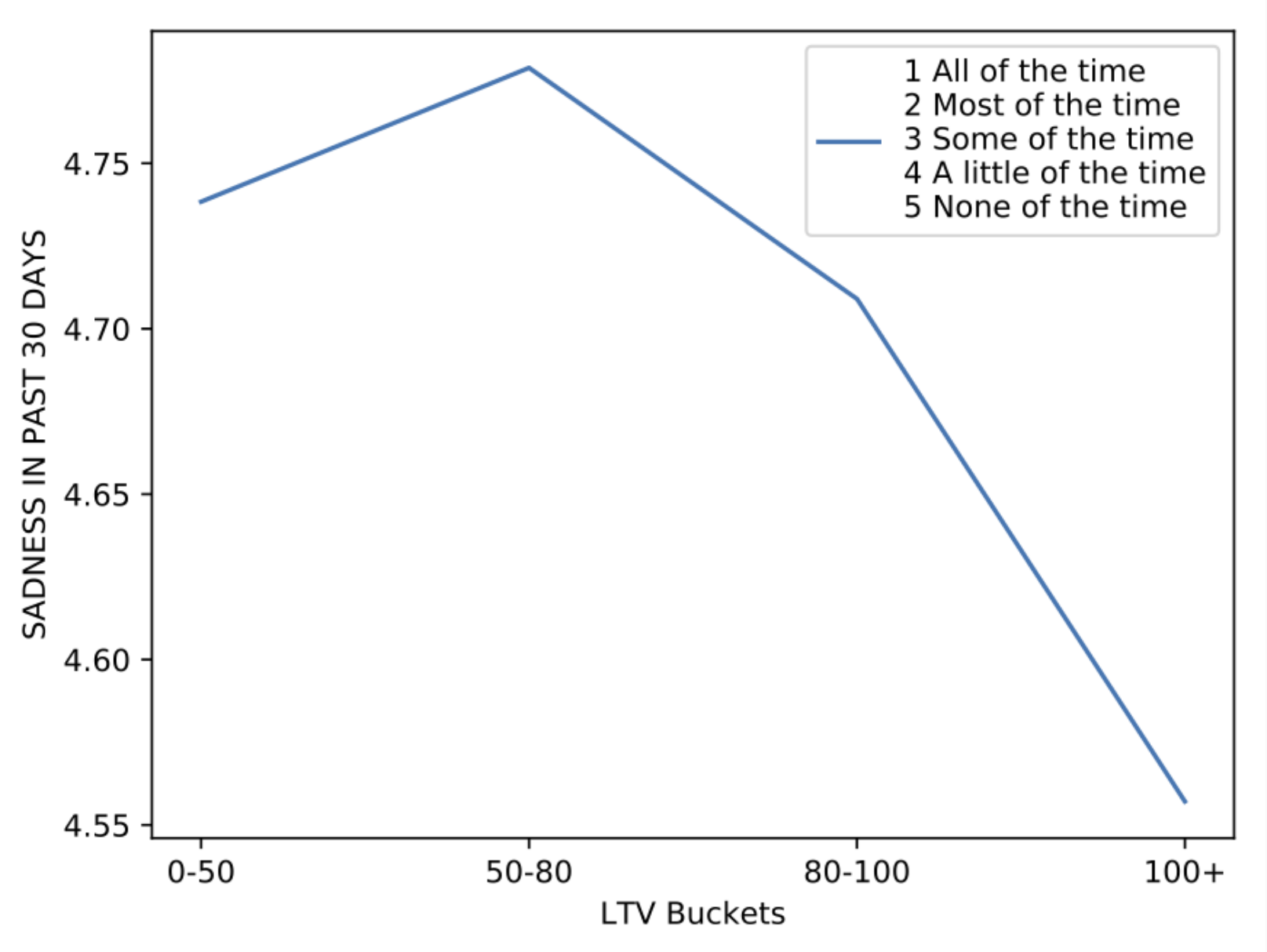
Psychological channels:

1. Higher risk aversion after wealth loss (Paravisini Rappoport Ravina 2015)
2. Stress after housing losses (scarcity mentality, next)

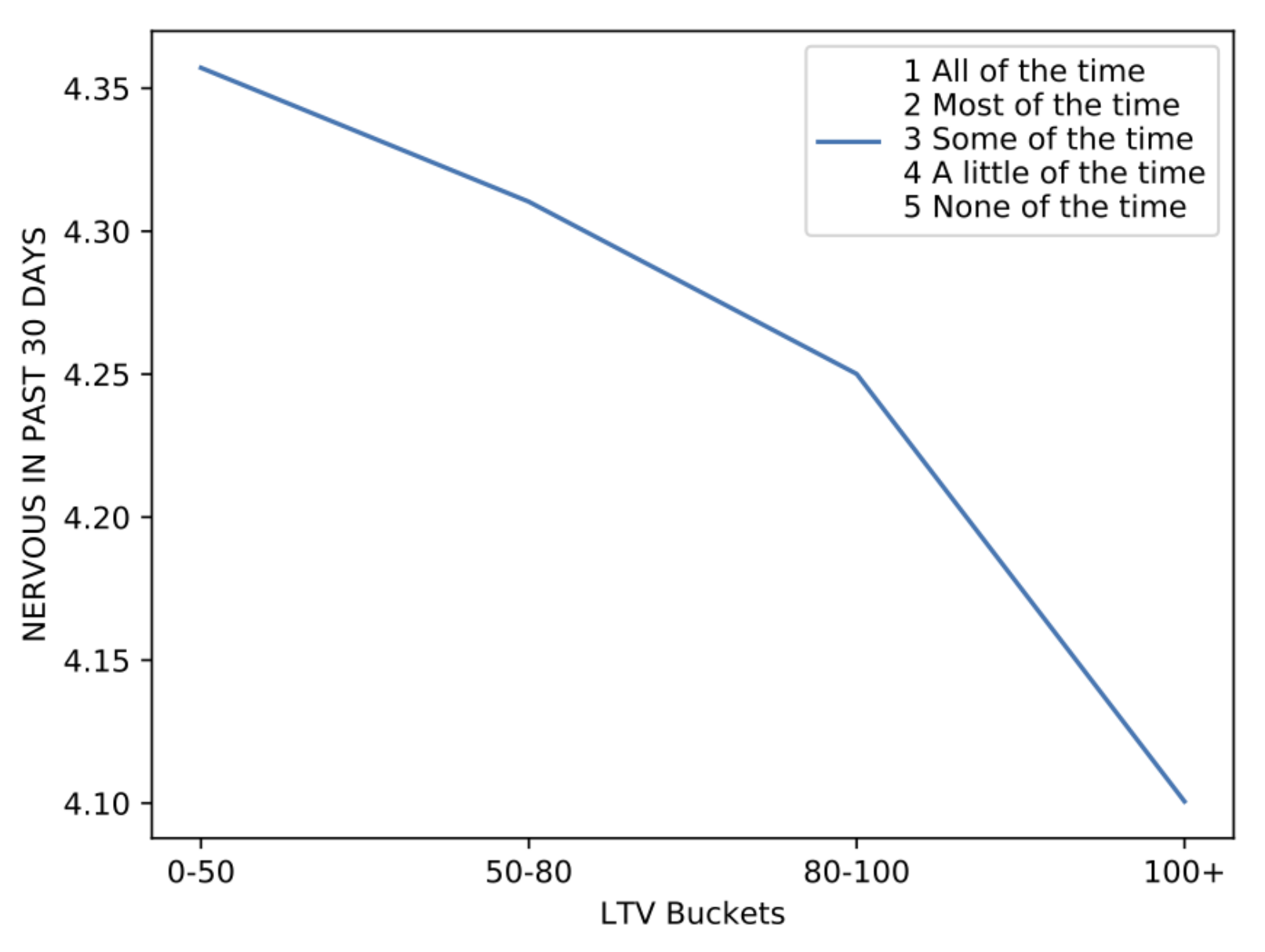
PSID: Negative Equity → Difficulty in Mortgage Repayment



PSID: Home Price Losses → Sadness



PSID: Home Price Losses → Nervousness



How to Separate Some of these Channels

- Many channels (and several vast literatures) link home price declines and individual outcomes
  - All channels go through "demand" pathway
  - But would be nice to know the precise mechanism
- Default risk channel is plausible; but requires
  1. safer innovation is rewarded internally through lower firing risk
  2. inventors can ex ante choose riskiness of innovation
- Alternate (complementary) channel: anxiety and stress over negative housing wealth lowers creative worker productivity
  - Consistent with finding that effect is stronger for borrowers who bought at the top (lowest equity)
  - Consistent with innovation worse in all metrics (how are these projects any safer?), slightly different conclusion

Suggestion 2: Isolate Job Security Channel

Would like to see:

$$Pr(Job\ Separation) = y_{i,post} + \nu_{f,c} + \varepsilon_i \quad (1)$$

$$Pr(Job\ Separation) = \beta \Delta\% HP_{z,post} + \delta y_{i,pre} + \nu_{f,c} + \varepsilon_i \quad (2)$$

(1): How is patent productivity rewarded internally?

(2): If price-shocked inventors alter innovation along creativity-job security frontier, expect to see $\beta > 0$. If instead inventors are simply stressed and less productive overall, $\beta < 0$.

Conclusion

- Great paper making use of rich microdata
- Important contribution to think about household level shocks as drivers of innovation
- Fits in well to broader debates on
  - supply/demand side factors of innovation
  - personal experiences as drivers of behavior
  - understanding innovation at an individual level
- Would be really interesting to tease out precise mechanisms

Thanks

Thank You!