

Adverse Selection on Maturity: Evidence from Online Consumer Credit

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This Paper

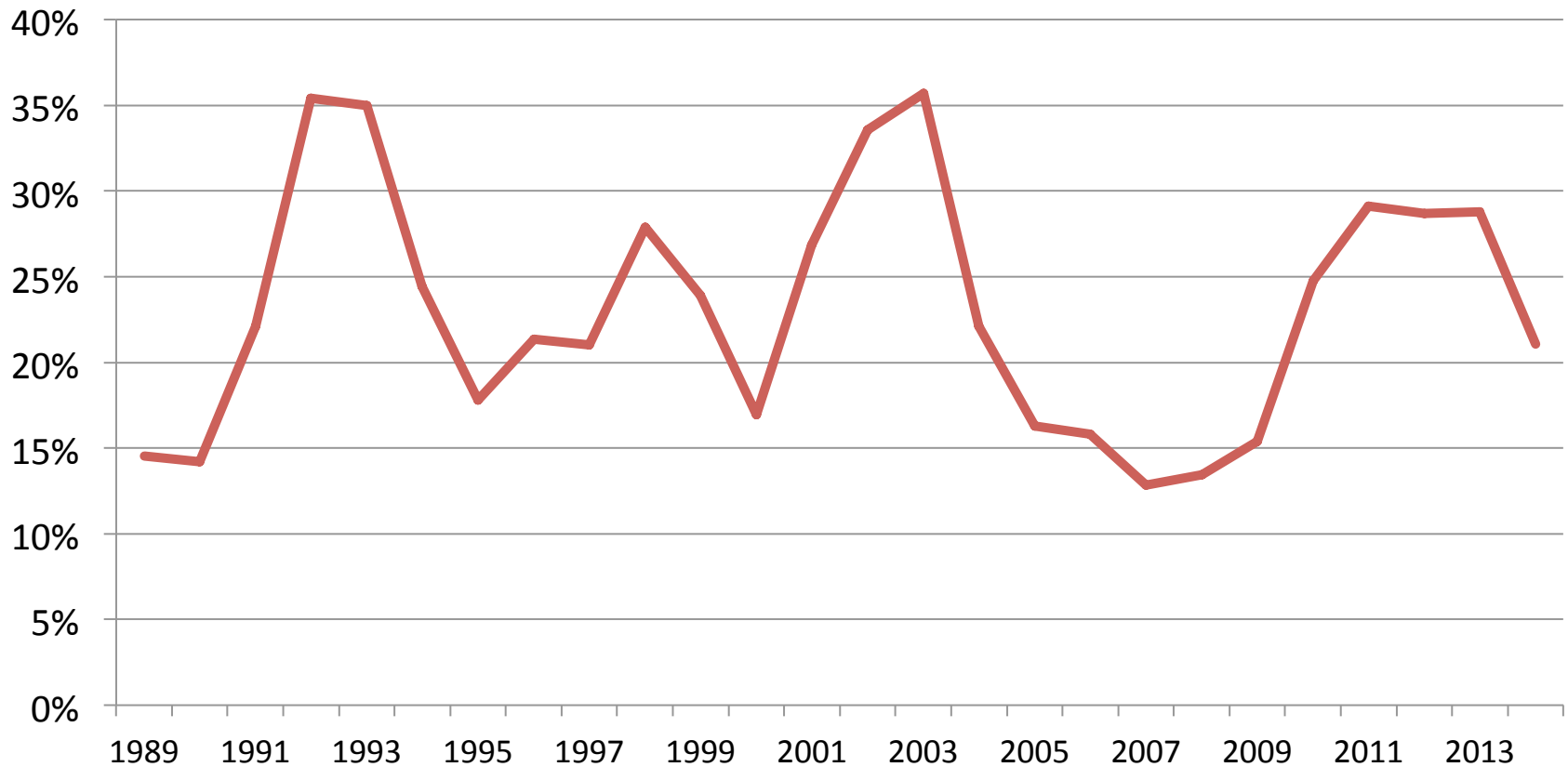
- Context: Asymmetric information means borrower screening in credit markets is hard!
 - Stiglitz-Rothschild-Weiss-Jaffee: can backfire
- Proposition: let borrowers choose maturity, they will self-select on private information
- Evidence: Lenders that choose short term when long-term available better than short-term borrowers w/o long-term option
- Theory: Maturity screening more efficient than loan-size screening

So what?

- Functioning credit markets important
- Many results require no credit constraints
- Big externalities from collapsed credit markets
 1. Having maturity choice is common
 2. Demand elasticity w.r.t. maturity \gg rates
 3. Maturity screening easier
 4. Target of policy: Dodd-Frank, Canada

1. Having Maturity Choice Common

Fraction of Originated Mortgages with Term < 30 Years



Source: LPS data; author's calculations

2. Demand Elasticity for Maturity High

- Evidence that demand elasticity greater for term length than interest rate.
 - (By the way, is this margin present here? When borrowers discover 5 year option, increase loan size? Maybe not because credit card debt amount is fixed at time of decision)
- Elasticity result is because it's all about payment size!
- Example: \$13K loan for 2.5 years at 15% APR
- Consider three scenarios:
 1. Baseline: \$522
 2. 20% decrease in interest rate: \$504
 3. 20% increase in term length: \$450

3. Maturity Screening Easier

- Lending to risky type needs to be compensated
- Screen on FICO expensive, highly predictive (significant) but not huge R^2 because of private information
- Screening on loan size inefficient since has direct welfare consequences to not borrow amount optimal for smoothing, etc.

4. Maturity is Policy Target

- Regulators often declare a particular contract feature or type of product equal based on cross-sectional comparisons of default rates
- Leads to Dodd-Frank (effectively) outlawing 40 year+ mortgages, mortgages with most prepayment penalties, mortgages with IO features, etc.
- Regulators assume that poor performance is *causal* effect of, e.g. longer maturity, prepayment penalties
- This paper shows that this blame is misplaced!
- Maybe some causal effect of contract features on default, but clearly there is massive selection into these contracts.
- Maybe *not* the case that an identical borrower who is randomly assigned a long-maturity loan more likely to default.
- If the story is just one of selection (as in this paper) then regulators are misplacing the blame for those defaults on those features.
- Point holds more broadly to comparing outcomes across financial contracts.

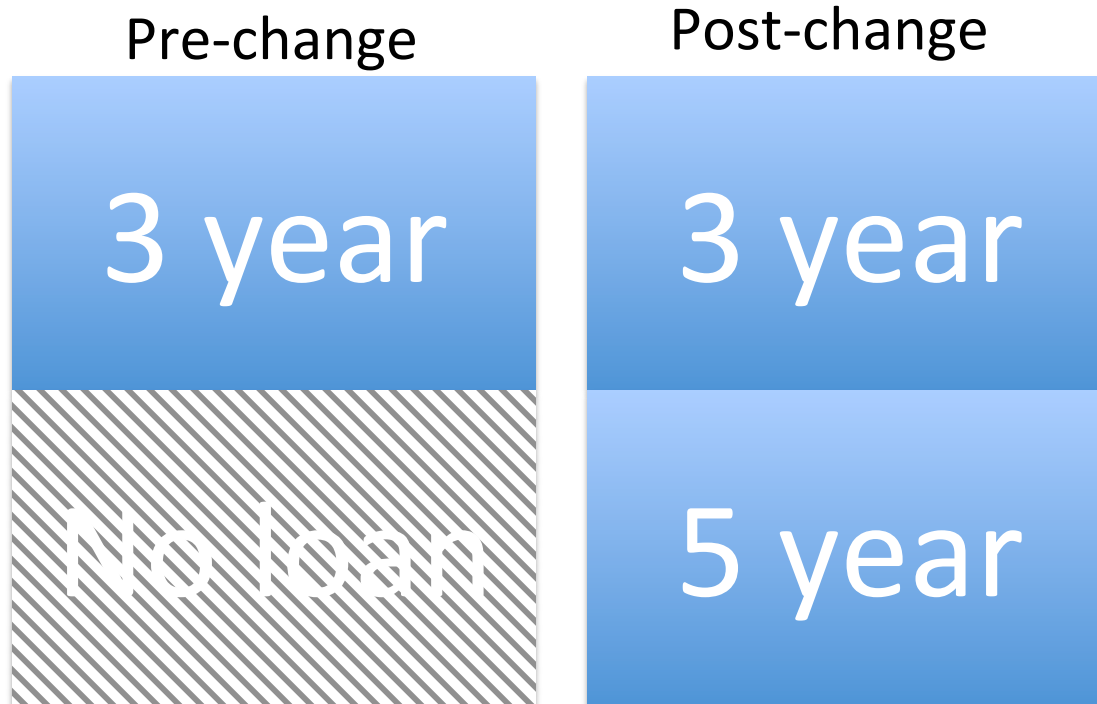
Sample: Typical Borrower

- Earning \$66K/year (very cool to know this)
- FICO 695, 61% utilization of non-mortg debt
- 56% mortgagor, likely underwater
 - (since not taking out a 6% APR HEL/HELOC)
- Average 33 years old (15 year credit history)
- 3- or 6-year LC loans, \$5-20K face, 16.3% APR
- Unsecured loan to consolidate and pay down debt (esp. credit card)
- Average installment \$380/month
- 9.2% will be 120+ days late

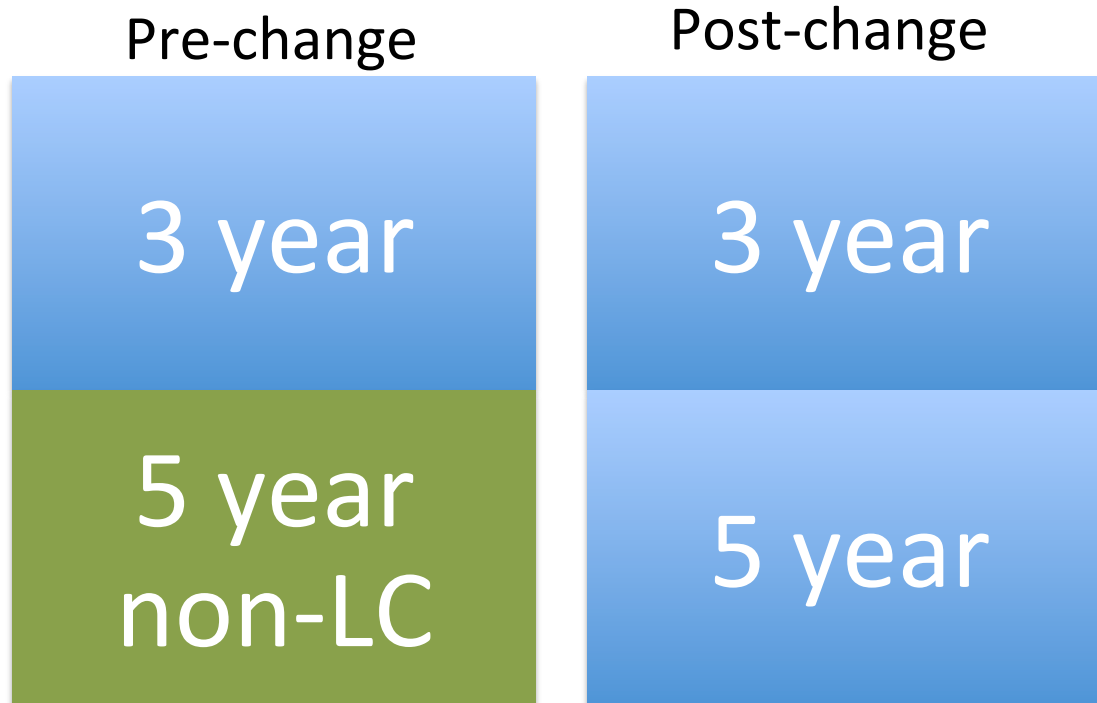
Identification

- Can't compare 15-year and 30-year mortgages to learn about self-selection
 - Nowhere near comparable situations
- Want to hold payment + NPV fixed. How can you do that *and* vary term? Can't.
- Here, vary availability of other option. Bingo.

Described Policy Change



Likely Actual Policy Change



Control group

- Key worry with control group:
- Bad types in short-term-only regime are *really* bad because they don't have access to non-LC options for longer-term loans.
- Mitigated by the fact that borrowers *didn't know* 5 year option existed before applying.
- But could show that (ST+LT) pooled performance for \$12K loans same before and after to show aggregate composition hasn't changed

Results

- 16% of borrowers select out of short, into long
 - (14.5 log points is ~16%, so results may be larger)
- Borrowers who actively select into short term (i.e. who could've selected longer term):
 - Default less
 - Decrease in FICO less
 - (cf. On average, borrower FICO decreasing)
- Clear that performance better among short-term borrowers. Next question: why?
- Could be lots different about ST/LT borrowers

Interpretation

- Authors: LT contract is insurance against future volatility
 - Those that need insurance (private info on future volatility) select out of short-term loans
 - Short-term has roll risk (also was issue with Repo, GSEs)
- Intuitive but empirical evidence on insurance shaky:
 - Defaults not right away => subtle information
 - Effect of remaining balance: distress with \$2K left << distress with \$8K
 - Figure 8 shows consistent downward trend, consistent with proportional hazards model
 - More likely to prepay, too => income volatility
 - Mechanically true that longer contract more opportunity (and motive) to prepay? Need hazard model to lock this down. Control directly for outstanding balance?

Proportional Hazard Model

- Posit literature-standard Hazard Model:

$$\lambda(X,LT,t) = \exp(X\beta + \alpha LT)\lambda_0(t)$$

– where $\lambda_0(t)$ is the baseline hazard

- @ time t, LT contracts default by a proportional factor e^α more than ST
- In levels, differential default rate is
$$(e^\alpha - 1)e^{X\beta}\lambda_0(t)$$
- Growing in t so long as baseline hazard is, too

Fig 8: Default Differential Over Time

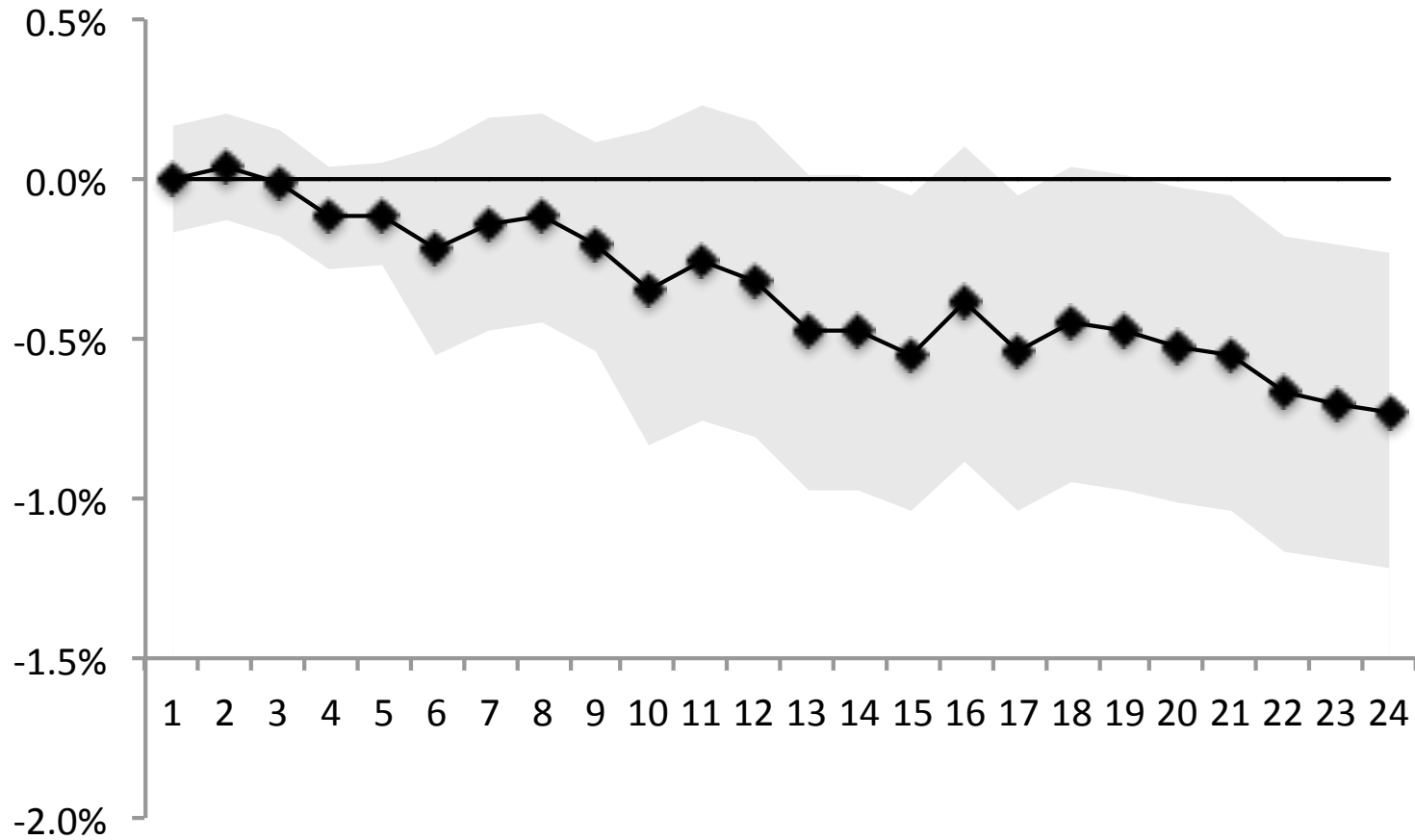


Figure 8 Comments

- How much of insurance evidence rests on Fig 8?
- Proportional hazard story not fixed by diff-in-diff
 - Seems it would be fixed by putting in a differential trend for LT borrowers that would capture this
- Seems to be a trend, not a late-resolving uncertainty story
- Precision an issue
- Can't reject flat in the later period

Other Interpretations

- Could be demand for implicit insurance against privately observed future volatility
- Can't be: ex-ante credit risk, income, vintage
 - (all controlled for)
- PTI? Same volatility but select into LT because PTI higher and want more disposable income?
 - Default more because of high PTI
- Impatience (discount rate) / taste for disposable income?
 - Default more because of less saving

Missing Literature

- Self-selection in consumer credit:
 - Mortgage points, prepayment penalties
 - Exactly this story.
 - Stanton and Wallace (2003)
 - Mayer, Piskorski, Tchisty (2013)
- Payment size matters!
 - Maturity provides biggest changes in payments
 - Mortgage modification lit, e.g. Eberly & Krishnamurthy (2014)
 - Fuster & Willen (2015)

Little Stuff

- Control for loan size? Remaining balance? Control for payment-to-income explicitly?
- 9.2% default result controls for loan age/ censoring?
- Could plot baseline hazard for ST vs. LT borrowers to see where diverge
- “the average future FICO score of the 14% of borrowers that self-select into the long maturity loans is $2.3/14\% = 16.4$ points ~~higher~~” should be “lower” (page 14)

Conclusion

- Borrowers sort themselves on maturity ✓
- Predictive of future loan performance ✓
- Nice theory: private info on future income volatility makes LT attractive as insurance ✓
- Just OK empirical evidence for insurance story
- Implications for market pricing of maturity?
- Hold our hands on how this could change the way we think / run credit markets.