The limits of self-commitment and private paternalism
Preliminary –comments welcome

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Motivation: Private paternalism

- Many institutions —firms, schools, financial contracts— restrict choice using built-in commitment mechanisms which help workers, students, borrowers overcome self-control problems
  - Loans with fixed repayment schemes, homework due dates, etc.
- At the same time these firms hide these forcing mechanisms and don't market their commitment features, potentially because demand for them is low.
- Laibson (2018) argues that clients that benefit from commitment may underestimate its value, and that in such cases private paternalism could be beneficial.
- **We study the benefits of imposing a structured repayment contract, whether there is demand for it, and whether non-takers of such a commitment product would benefit from taking it.**

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Context

- Pawn loans involve borrowers leaving valuable liquid assets as collateral in exchange for an immediate cash loan
- The loan is overcollateralized (loan is 70% of appraised value) and collateral is liquid.
  - The lender approve loans in a few minutes without income or credit history check → used for emergencies.
- Because the loan is overcollateralized and collateral is liquid, the lender may gain if the borrower defaults on the loan, especially if the borrower pays towards recovery on the way to default.
- Among those that lose their pawn (60%), 48% paid a positive amount towards its recovery and on average paid 42% of loan.
- This happens in spite (or because?) of 74% of borrowers reporting a 100% subjective probability recovery ex-ante.
- 13% of borrowers are classified as present biased using the simple standard question.
- In such an environment, one may ask if putting more structure in payments may help borrowers recover their pawn.

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Methodological Contribution

- A context of particular interest to behavioral literature: the demand for commitment in financial contracts (Laibson 1997, Bryan et al. 2010), and many more.
- Key quantity in debate about paternalism: impacts on those who wouldn't elect to take the program versus impacts on those that do. How do treatment effects relate to selection?
- Large literature estimating ToT and TuT to better understand who selects into treatment and why :
  - "LATE-and-reweight" : Aronow & Carnegie (2013); Angrist & Fernandez—Val (2013) - no selection on gains.
  - Cornelissen et. al. (2018); Walters (2018) - Modeling assumptions to extrapolate from the reduced-form quantities
  - Heckman & Vytlacil MTE - no parametric restrictions, but an instrumental variable Z with sufficiently rich support.
  - Brinch et. al. (2017) - discrete Z but under some additivity restrictions on the MTE curve
  - Mogstad, Santos & Torgovitsky (2018) - No parametric form assumption on MTE curve but only partial identification.
- Our "Controlled Choice" design point identifies a number of interesting and economically-relevant causal quantities without the need for additional structural restrictions. Identification
- Consider winners and losers from paternalism.

Outline

- Experimental Design
- Main results
- **Paternalism**

Pawn contract

Status-quo Contract

Pay when you want (before 3 months)

✓**Term**: loan must be paid **before 3 months**.

✓**Amount owed**: Loan + Accumulated interest before loan term ends**.** Interest accumulates daily on outstanding amount.

✓**Flexibility**: you can pay any quantity at any time before 90 days **with no prepayment penalty.**

Structured payments contract

- We designed a new contract that is identical to the status quo contract except that it enhances the regularity and salience of payments as a way to encourage repayment.

Forced-commitment Contract

3 mandatory monthly payments

✓**Term**: loan must be paid **before 3 months**.

✓**Amount owed**: Loan + Accumulated interest before loan term ends. Interest accumulates daily on outstanding amount.

✓**Commitment**: to give you structure, each month you must pay at least 1/3 of the loan; that is: 3 equal sized payments. By missing it you incur in a **penalty fee of 2%** of the monthly payment due.

Data

- Administrative data: 1 month before and 8 months after the experiment ended
  - Unique identifier for each client and each pawn.
  - Value of the item, money loaned (70%), date of pawning
  - For all payments: date and amounts
  - Fees incurred
  - Whether the client lost the pawn, renewed the contract

- Survey data
  - During experiment, we asked clients to complete a 5-minute survey before going to the teller window to appraise their piece and before treatment status was known to them.
  - Demographics, proxies for income/wealth, education, present-biased preferences, experience pawning, if family or friends commonly asked for money, cost of going to branch, the subjective probability of recovering, the subjective value, etc.

Main outcomes: financial cost and default

- We are interested in measuring the financial cost of borrowing, which very saliently includes the cost of defaulting on the loan and losing the pawn.
- We will measure loan default using an indicator $\mathbb{1}(\text{Default}_i)$, and the cost in pesos using the following definition that capture borrower outlays:

$$\text{Financial Cost}_i = \underbrace{\sum_t P_{it}^i}_{\text{Pay to Interest}} + \underbrace{\sum_t P_{it}^f}_{\text{Pay to Fees}} + \mathbb{1}(\text{Default}_i) \times \left[\text{Pawn Val}_i + \underbrace{\sum_t P_{it}^c}_{\text{Pay to Capital}} \right]$$

Treatment arms

- Randomization at the branch-day level. Analysis at the pawn level.
  - Control arm (1770 obs)
  - Forced Commitment arm (1954 obs)
  - Choice Commitment arm (2580 obs)
- The existence of a choice arm allows us not only to measure if there is demand for such a contract, but who demands it, not only in demographic terms, but in terms of potential treatment effects.
- This design is innovative and critical for our purposes, as it enables us to explore whether or not forcing people into a structured payment contract could be more beneficial than allowing choice for a significant fraction of them

Main results

		Components of FC				
	FC	Int. pymnt	Fee pymnt	Princ. pymnt	Lost pawn val	Default
	(1)	(2)	(3)	(4)	(5)	(6)
Forced cmit	-379.7***	-157.3***	32.1***	-0.57	-254.5**	-0.065***
	(111.4)	(34.9)	(1.43)	(3.03)	(104.8)	(0.023)
Choice cmit	-84.9	-24.9	1.34**	-3.98	-61.4	-0.025
	(114.6)	(38.4)	(0.54)	(2.47)	(109.2)	(0.021)
Observations	6304	6304	6304	6304	6304	6304
R-squared	0.007	0.022	0.151	0.003	0.007	0.013
Control Mean	1851.0	545.9	0	5.82	1305.1	0.44

More

Mechanisms

- Borrowers in the Forced commitment contract pay earlier (-13.8 days), make larger payment in their first visit (+7.9%), and a larger fraction (+7.9%) pay in full.
- Decreases probability of making a payment and not recovering by 7pp.

Details

Choice and Heterogeneous Treatment Effects

- Commitment works. In spite of this, given the opportunity, only 11% of borrowers chose commitment.
  - If the effect of commitment were homogeneous, this would be enough to conclude that the 89% who did not choose it would have been financially better-off if they had.
- We test and reject the null hypothesis of homogeneous treatment effects (Chernozhuvok et. al. (2018).
- The borrowers who did not choose commitment could simply be those who don't need it?
  - At least 30% of individual borrowers benefit from commitment Fan & Park bounds

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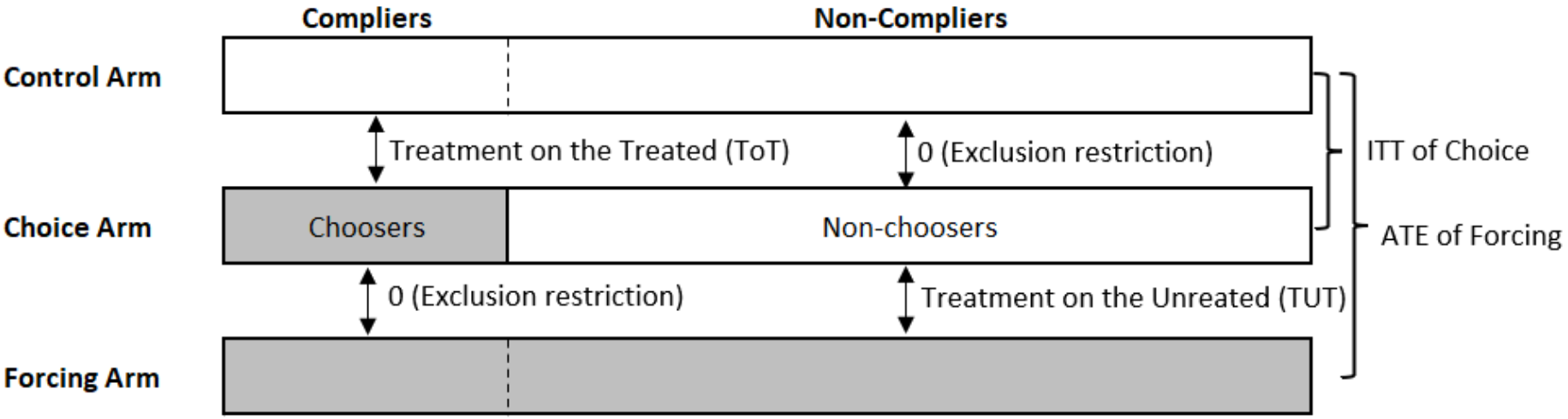
The "Controlled Choice" Design



The "right people" choose to commit

- Commitment increases average financial benefit even for the subset of borrowers who would not choose to commit voluntarily.

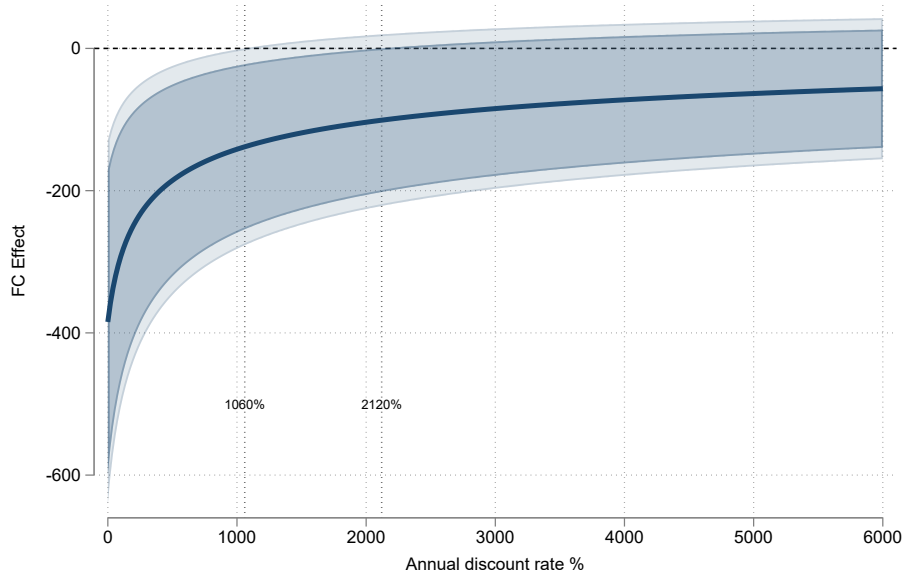
	FC benefit	% (1-Default)
	(1)	(2)
ToT	668.3	38.7*
	(1085.4)	(21.5)
TuT	356.1***	3.98*
	(107.8)	(2.40)
ToT-TuT	312.2	34.7
	(1132.4)	(22.5)
ASB	-77.9	-40.6*
	(1127.5)	(22.2)
ASL	234.3	-5.90
	(154.4)	(4.29)
Observations	6304	6304

If commitment works, why don't people choose it?

- Discounting
- Hyperbolicity

- Can impatience explain why not take up a contract that decreases overall cost?

Figure: Financial cost for different discount rates



- Commitment contract imposes up-front costs for later benefits (collateral recovery).
- Requires a rate of 2,000% to make NPV cost effect insignificant.

If commitment works, why don't people choose it?

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- Standard behavioral angle: compliers are sophisticated time-inconsistent, non-compliers are a mix of naifs and the time consistent (who don't need commitment).

	Choosers	**Non Choosers**
Present bias	Sophisticated	Naifs
Time consistent		Rationals

- We have survey measure of time inconsistency taken at baseline.
- Effect of forcing commitment should be entirely among the time-inconsistent. Is this true?

If commitment works, why don't people choose it?

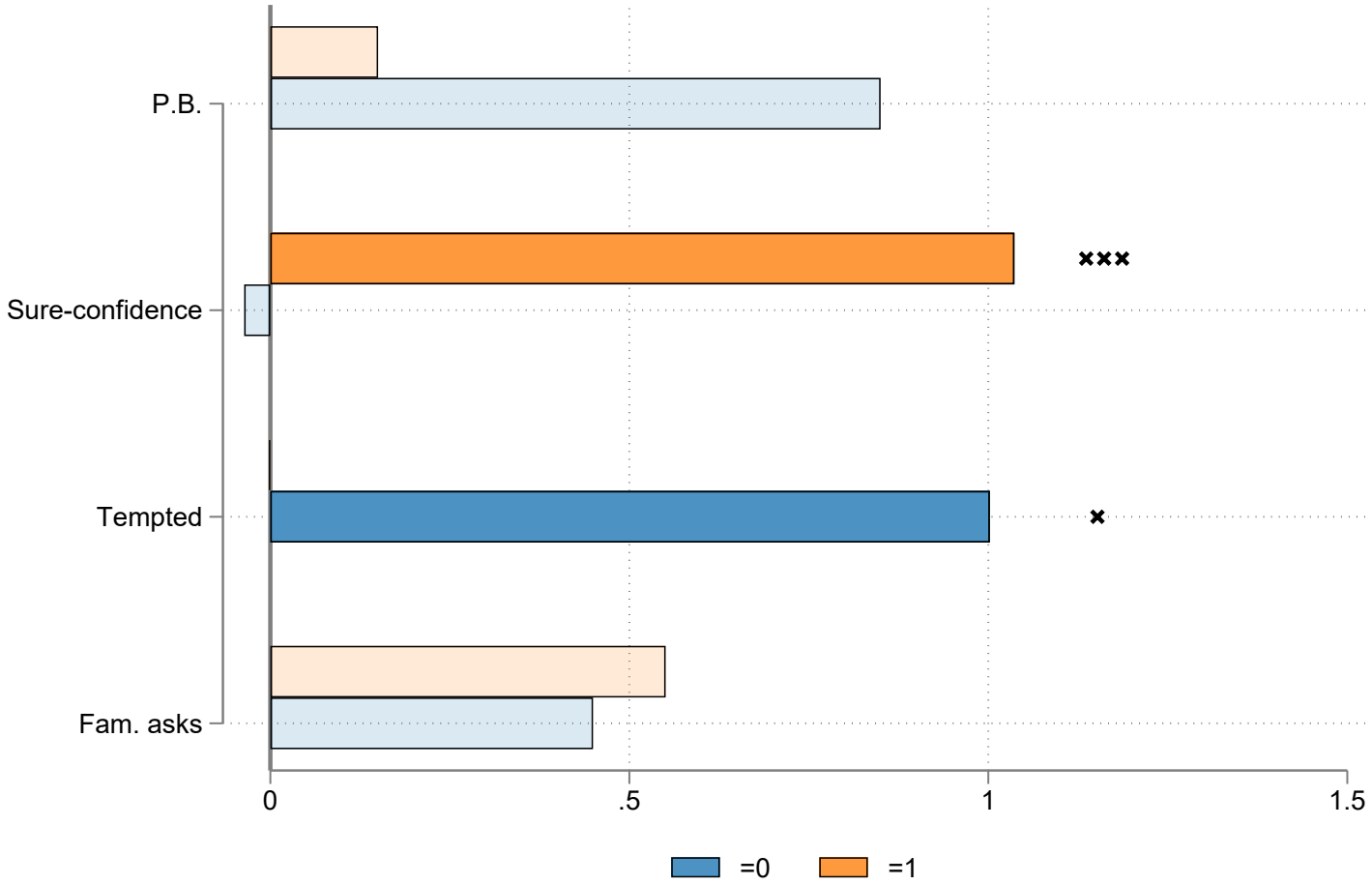
- Discounting
- Hyperbolicity

- We estimate the TuT conditional on PB_i and test whether these estimates are significant and close to the TuT.

$$1 = \frac{\mathbb{E}[TE_i|T_i = 0, PB = 1]}{TuT} \Pr(PB = 1|T_i = 0) + \frac{\mathbb{E}[TE_i|T_i = 0, PB = 0]}{TuT} \Pr(PB = 0|T_i = 0)$$

Possible Behavioral explanations

Figure: TuT



Effects of treatment on future pawning behavior

	Ever pawns again (ITT)				
		After 90 days	Within 90 days	Different collateral	Cond. on rec
	(1)	(2)	(3)	(4)	(5)
Forced commitment	0.067*	0.037***	0.032	0.048*	0.11**
	(0.035)	(0.013)	(0.027)	(0.029)	(0.046)
Choice commitment	0.040	0.0098	0.030	0.036	0.058
	(0.031)	(0.0087)	(0.026)	(0.026)	(0.041)
Observations	4441	4441	4441	4441	2173
R-squared	0.003	0.006	0.001	0.002	0.008
Control Mean	0.32	0.020	0.30	0.29	0.35

Paternalism and learning

- Are people learning?

- Are those with a greater experience of pawning less sure-confident?
- Do people learn from Forced exposure to the program that they benefit from it?

- Finally: how to target and who would be hurt if we instituted paternalism?
  - Who are the winners and losers (conditional TuTs).

Conclusion

- Financial cost reduced in 20% in the Forced arm
- Results suggest selection on gains, but still large effects of imposing commitment on non-compliers.
- Mystery of low take-up combined with large TUT seems best explained by sure-confidence among pawnshop customers.
- Laibson has spoken of 'veiled paternalism' in contexts where principals desire reliability; here we have a case of 'veiled non-paternalism' where features encouraging default might be embedded.
- Suggests mandated commitment-based contract structures in payday/pawnshop loans as a form of pro-poor regulation?
- Novel design to study essential heterogeneity : "Controlled Choice"
  - Combine "Controlled Choice" with MTE : Can we extend results of Mogstad et al (2017) to use our ATE, TUT, and TOT as additional inequality restrictions that constrain partial identification bounds for MTEs?

Context

Figure: Pawnshop

Figure: Pawnshop

Figure: Appraiser/tellers inside a pawnshop

Figure: Lost pawns which are for sale

Experimental integrity

Table: Attrition table

		Commitment arms		
	Control	Forced	Choice	p-value
Number of branch-day pawns	34	34	36	0.52
	(3)	(2.9)	(1.8)	
Ended up pawning	0.98	0.97	0.97	0.62
	(0.01)	(0.01)	(0.01)	
Survey response rate	0.79	0.76	0.77	0.62
	(0.02)	(0.02)	(0.01)	
Obs	1770	1954	2580	

Difference number in pawns

$$Pawns\ per\ day_{jt} = \alpha_j + \gamma f(t) + \beta_b \mathbb{1}(t \in MB)_t + \beta_a \mathbb{1}(t \in MA)_t$$

Table: Number of pawns balance before and after the experiment

	Pawns per day			
	0-degree	1-degree	2-degree	3-degree
	(1)	(2)	(3)	(4)
β_a	2.48	-3.32	-0.65	-0.65
	(1.36)	(1.85)	(2.80)	(2.80)
β_b	0.20	1.82	1.32	1.32
	(0.97)	(0.93)	(0.67)	(0.67)
Observations	628	628	628	628
R-sq	0.737	0.747	0.747	0.747
Branch FE	✓	✓	✓	✓

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Balance and Summary statistics

Table: Summary statistics and Balance

		Commitment arms		
	Control	Forced	Choice	p-value
	Panel A : Administrative Data			
Loan amount	2267	2162	2223	0.65
	(76)	(83)	(66)	
Weekday	0.88	0.89	0.83	0.56
	(0.044)	(0.035)	(0.048)	
Obs	1770	1954	2580	
	Panel B : Survey Data			
Subjective value	4084	3877	4173	0.51
	(186)	(193)	(172)	
Income index	0.19	0.21	0.18	0.67
	(0.024)	(0.023)	(0.02)	
Present bias	0.14	0.13	0.13	0.89
	(0.02)	(0.01)	(0.01)	
Makes budget	0.62	0.59	0.65	0.29
	(0.028)	(0.036)	(0.021)	
Subj. pr. of recovery	91.89	91.65	93.61	0.09
	(0.721)	(1.031)	(0.582)	
Pawn before	0.87	0.89	0.9	0.25
	0.02	(0.013)	(0.011)	
Age	43.32	42.85	43.82	0.73
	(0.688)	(0.949)	(0.792)	
Woman	0.73	0.72	0.71	0.88
	(0.023)	(0.019)	(0.02)	
+ High-school	0.66	0.67	0.65	0.84
	(0.027)	(0.022)	(0.018)	
Obs	1386	1469	1982	

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Histogram of payments

Figure: Status-quo

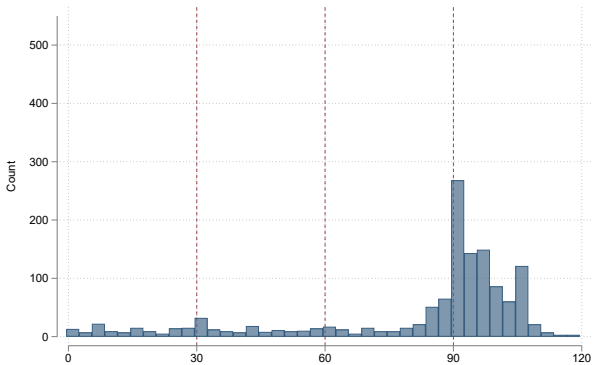


Figure: Forced commitment

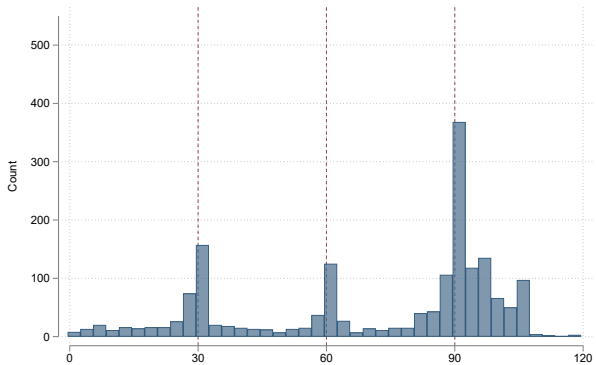
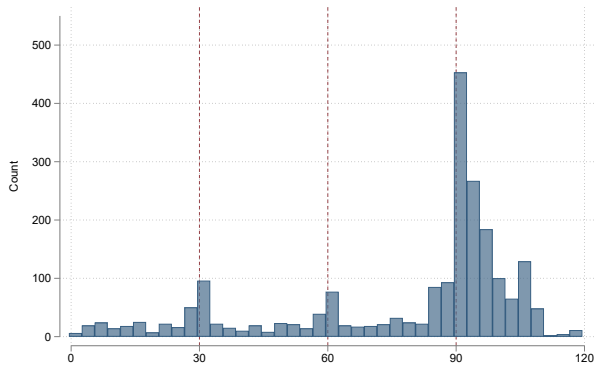


Figure: Choice commitment



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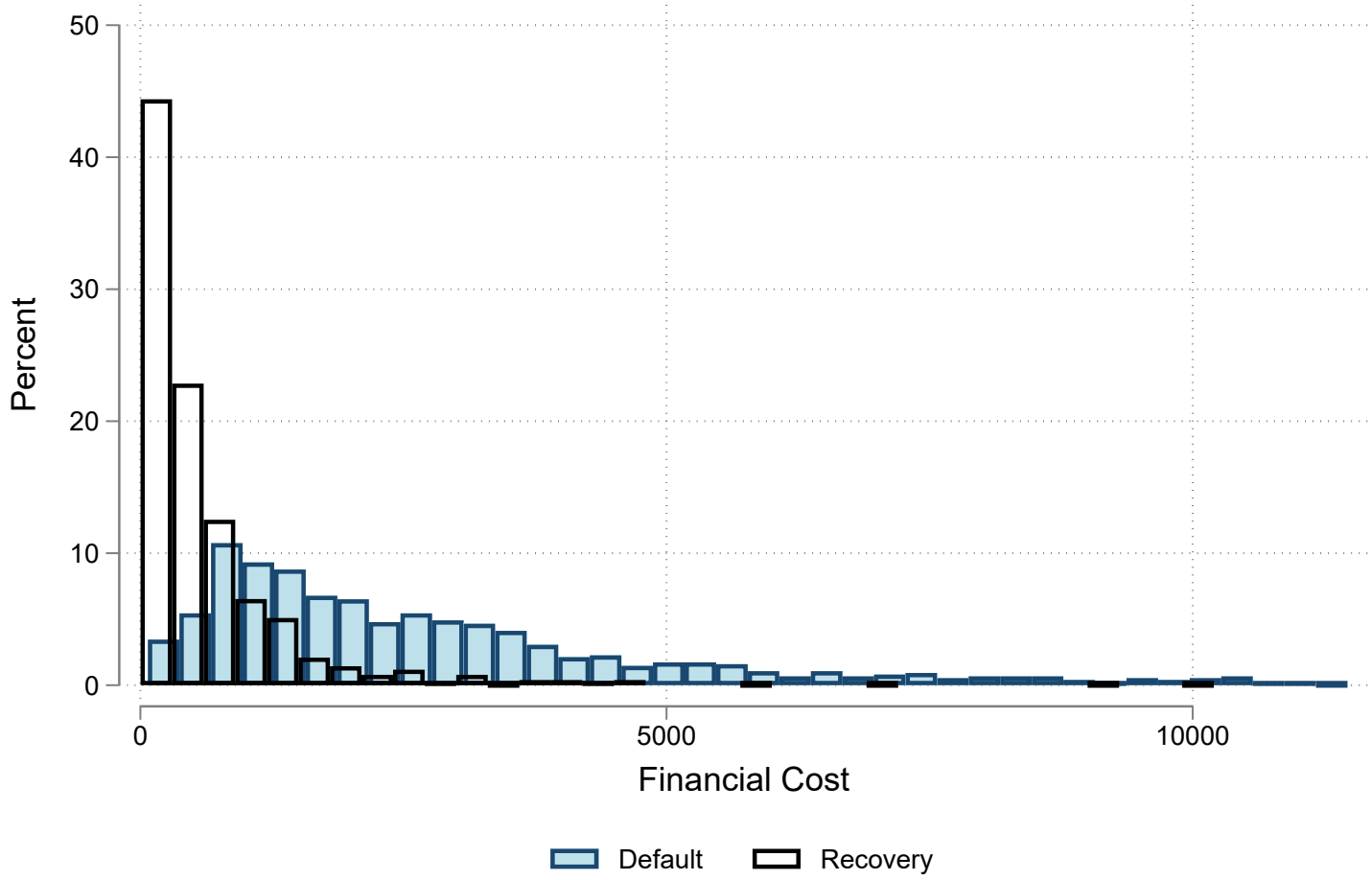
Distribution of financial cost ($MXN)



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Several definitions of cost

Table: Effects on several definitions of cost

	FC	FC (subj.value)	FC + tc	FC - interest	FC (subj.value) + tc - int
	(1)	(2)	(3)	(4)	(5)
Forced commitment	-379.7***	-473.6***	-383.4***	-272.2**	-320.0**
	(111.4)	(151.0)	(110.9)	(108.8)	(144.3)
Choice comitment	-84.9	-104.0	-78.6	-79.8	-72.9
	(114.6)	(153.8)	(114.3)	(114.2)	(149.0)
Observations	6304	6304	6304	6304	6304
R-squared	0.007	0.007	0.007	0.006	0.006
Control Mean	1851.0	2297.2	1934.7	1387.9	1834.9

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Survival Graph

Figure: Ended

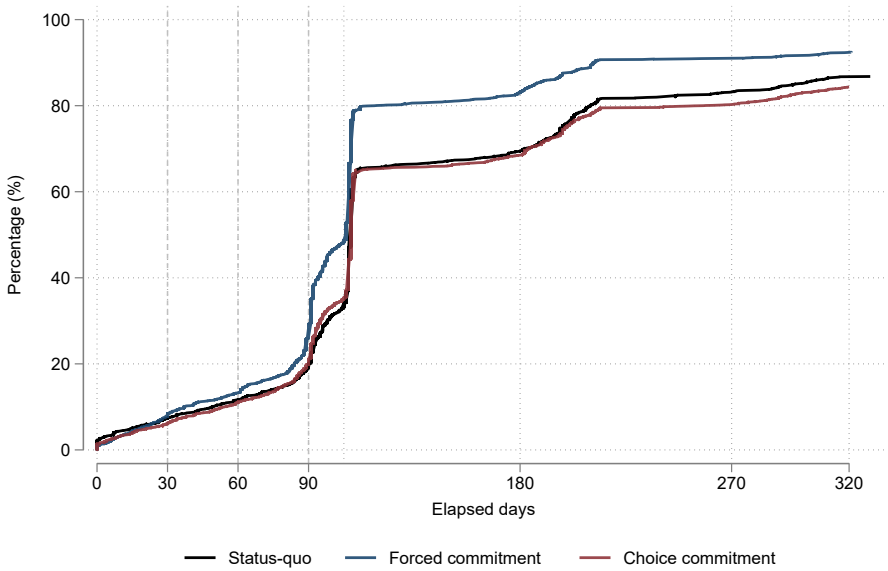
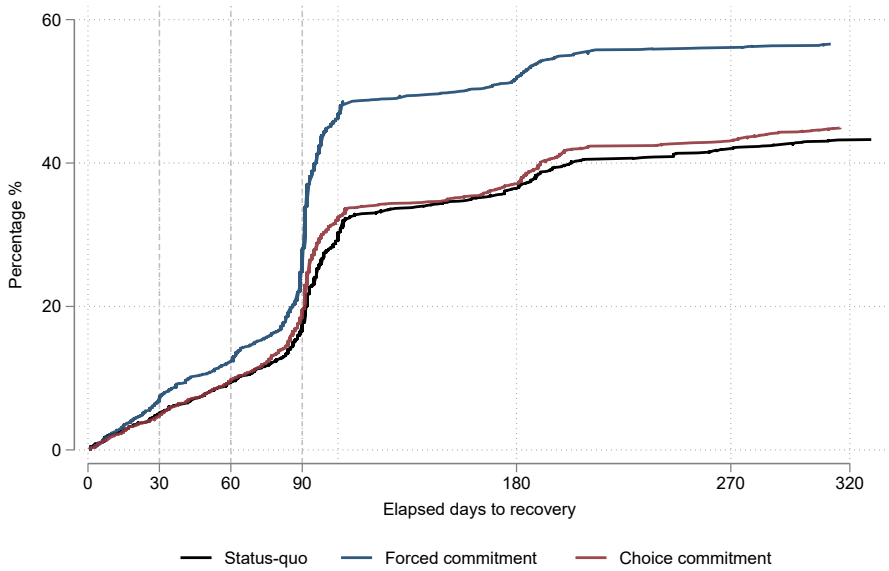


Figure: Recovery



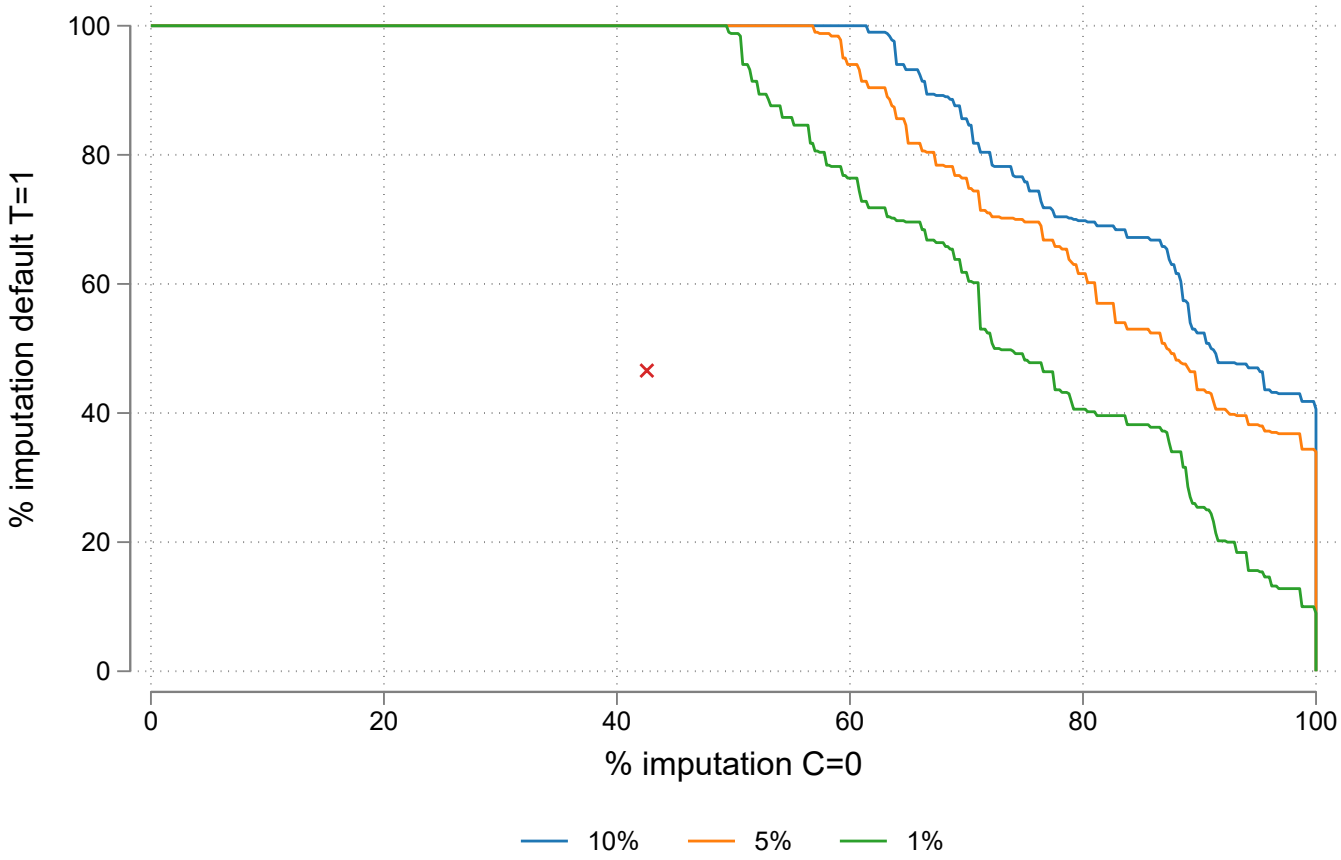
Censoring

Table: Bounding censoring

	Control = 0 Forced arm = 0	Control = 0 Forced arm = 1	Control = 1 Forced arm = 0	Control = 1 Forced arm = 1	Prediction model
			Financial Cost		
	(1)	(2)	(3)	(4)	(5)
Forced commitment	-408.7***	-226.5**	-804.2***	-622.0***	-525.3***
	(107.1)	(110.8)	(113.3)	(117.3)	(122.0)
Observations	3724	3724	3724	3724	3724
R-sq	0.012	0.009	0.022	0.015	0.012
Control Mean	1898.5	1898.5	2272.4	2272.4	2073.6
			Default		
	(6)	(7)	(8)	(9)	(10)
Forced commitment	-0.063***	0.0089	-0.21***	-0.13***	-0.12***
	(0.023)	(0.024)	(0.023)	(0.024)	(0.025)
Observations	3724	3724	3724	3724	6304
R-sq	0.019	0.014	0.053	0.028	0.016
Control Mean	0.44	0.44	0.57	0.57	0.51

Interpolation on bounding censoring

Figure: Significance area for Default



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Mechanism

Table: Intermediate outcomes

	Panel A : Speed of payment	
	Days to 1st payment	% of payment in 1st visit
	(1)	(2)
Forced cmit	-13.8***	7.70***
	(1.61)	(2.78)
Choice cmit	-3.51**	-0.85
	(1.57)	(2.19)
Observations	4412	6304
R-squared	0.055	0.014
Control Mean	82.8	44.7

	Pr(Recovery in 1st visit)	Loan duration (days)
	(3)	(4)
Forced cmit	0.079***	-27.9***
	(0.026)	(4.35)
Choice cmit	-0.010	-0.18
	(0.022)	(4.33)
Observations	6304	6304
R-squared	0.016	0.054
Control Mean	0.30	136.6

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Mechanisms

Table: Intermediate outcomes

	Panel B : Variables related to default		
	Pr(+ payment & default)	% of pay | def	Pr(Selling pawn | def)
	(5)	(6)	(7)
Forced cmit	-0.070***	-3.96***	0.14***
	(0.015)	(1.27)	(0.034)
Choice cmit	-0.028**	-2.11**	0.053*
	(0.014)	(1.04)	(0.029)
Observations	6304	2486	2486
R-squared	0.011	0.023	0.033
Control Mean	0.12	9.59	0.71

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Mechanisms

Table: Intermediate outcomes

	Panel C : Visit variables	
	# of visits	# of visits | def
	(8)	(9)
Forced cmit	-0.031	-0.19***
	(0.049)	(0.049)
Choice cmit	0.085	-0.090**
	(0.053)	(0.042)
Observations	6304	2486
R-squared	0.022	0.026
Control Mean	1.14	0.39

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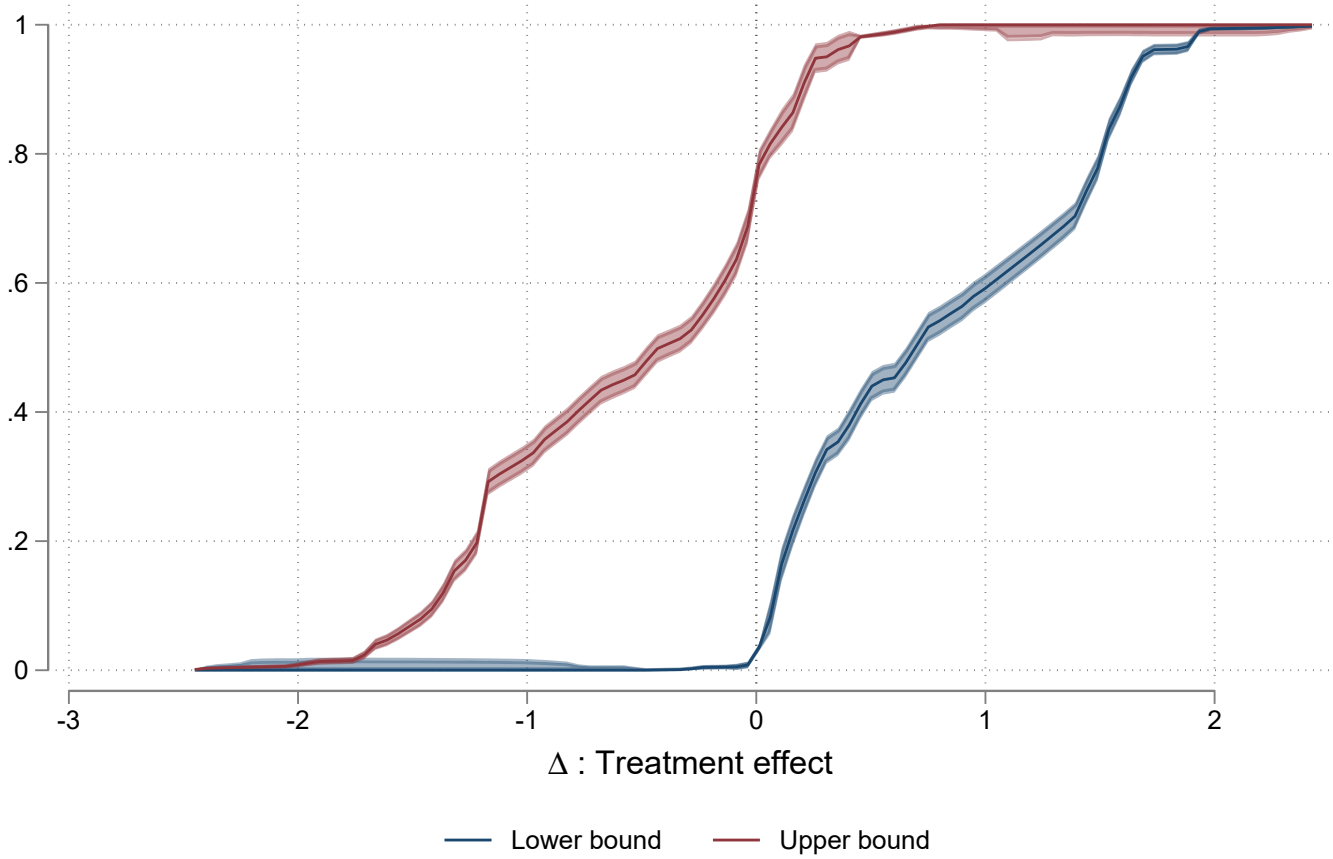
Bounding Individual Treatment Effects

Figure: Fan & Park bounds for benefit in effective FC



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Identification of treatment parameters

$$Y_i = \mathbb{1}(Z_i = 0)Y_{i0} + \mathbb{1}(Z_i = 1)Y_{i1} + \mathbb{1}(Z_i = 2)\left[(1 - C_i)Y_{i0} + C_i Y_{i1}\right].$$

Viewing Z_i as an instrumental variable, the randomized choice design can be interpreted as a pair of RCTs, each subject to one-sided non-compliance.

- The first of these compares $Z_i = 0$ to $Z_i = 2$. This setting is identical to a "randomized encouragement" design in which treatment is only available to those who are encouraged: $Z_i = 2$. Under this interpretation, those with $C_i = 1$ are "the compliers" and it follows that

$$\frac{\mathbb{E}(Y_i|Z_i = 2) - \mathbb{E}(Y_i|Z_i = 0)}{\mathbb{E}(D_i|Z_i = 2) - \mathbb{E}(D_i|Z_i = 0)} = \mathbb{E}(Y_{i1} - Y_{i0}|C_i = 1)$$

- The second considers $Z_i = 1$ to be the "encouragement" and compare the outcomes for these individuals to those with $Z_i = 2$.

$$\frac{\mathbb{E}(Y_i|Z_i = 1) - \mathbb{E}(Y_i|Z_i = 2)}{\mathbb{E}(D_i|Z_i = 1) - \mathbb{E}(D_i|Z_i = 2)} = \mathbb{E}(Y_{i1} - Y_{i0}|C_i = 0)$$

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Predictors of take-up

Figure: Prob. of take-up