Outcomes Appendix

The table below details the computation of important quantities that make up the analysis. For the formulas in the table, i indexes borrower, j and k index providers, l and m index loans (or loan applications), and t indexes time.

Outcome	Index	Concept and explanation	Formula or representation
Market size		Total number of providers	J
		Total accounts at provider j	N_j^a
	M1	Total accounts	$N^a = \sum_{j=1}^{J} N_j^a$
		Total number of disbursements for consumer i at provider j	N_{ij}^d
		Total disbursements at provider j	$N_j^d = \sum_{i=1}^{N_j^a} N_{ij}^d$
	M2	Total disbursements	$N^d = \sum_{j=1}^{J} N_j^d$
	C1	Loan size: Value of disbursement for loan l taken by consumer i at provider j	value_{ijl}^d

	M3	Total value	$\text{Total value} = \sum_{j=1}^{J} \sum_{i=1}^{N_j^a} \sum_{l=1}^{N_{ij}^d} \text{value}_{ijl}^d$
Concentration and competition		Provider value	$\text{Total value}_j = \sum_{i=1}^{N^a} \sum_{l=1}^{L_i} \text{value}_{ijl}^d$
	M5	Market shares	$S_j = \frac{\text{Total value}_j}{\text{Total value}} \times 100\%$
	M4	HHI (Herfindahl-Hirschman Index)	$\text{HHI} = \sum_{j=1}^{N^j} S_j^2$
	M6	k-firm concentration ratio	$\text{Concentration Ratio} = \sum_{j=1}^{k} S_j$
Loan contracts		Normal fees (interest fees, facilitation fees, etc. for loan l taken by individual i	Normal fees_{ijl}
		Contingent fees (rollover fees, penalty fees, etc. for loan l taken by individual i)	$\text{Contingent fees}_{ijl}$
		Cost	$\text{Cost}_{ijl} = \text{Normal fees}_{ijl} + \text{Contingent fees}_{ijl}$
	C2	Tenure	$\text{Tenure}_{ijl} = \text{Due date}_{ijl} - \text{disbursement date}_{ijl}$
	P1	Contracted APR (no contingent fees)	$\text{CAPR}_{ijl} = \left(\frac{\text{Normal fees}_{il}}{\text{value}_{ijl}^d} \frac{365 \text{ days}}{\text{Tenure}_{ijl}}\right) \times 100\%$

Repayment Behavior		Renegotiated	$\text{renegotiated}_{ijl} = \mathbf{1}(\text{loan } l \text{ renegotiated})$
		Rollover	$\text{rollover}_{ijl} = \mathbf{1}(\text{loan } l \text{ rolled over})$
		Loan repayment	$\text{repayment}_{ijl} = \mathbf{1}(\text{loan } l \text{ repaid})$
	R1	Effective tenure (defined for loans that have been repaid)	$\text{effective tenure}_{ijl} = \text{repayment date}_{ijl} - \text{disbursement date}_{ijl}$
	R2	Late repayment	$\text{Late repayment}_{ijl} = \mathbf{1}(\text{effective tenure}_{ijl} > \text{tenure}_{ijl}) + \mathbf{1}(\text{repayment}_{ijl} = 0 \ \& \ \text{end date} < \text{due date}_{ijl})$
	R3	Default	$\text{Default}_{ijl} = \mathbf{1}(\text{effective tenure}_{ijl} > \text{tenure}_{ijl} + 90 \text{ days}) + \mathbf{1}(\text{repayment}_{ijl} = 0 \ \& \ \text{end date} + 90 \text{ days} < \text{due date}_{ijl})$
	R4	Early repayment	$\text{Early repayment}_{ijl} = \mathbf{1}(\text{effective tenure}_{ijl} < \text{tenure}_{ijl})$
Pricing	P2	APR	$\text{APR}_{ijl} = \left(\frac{\text{Cost}_{il}}{\text{value}_{ijl}^{d}} \frac{365 \text{ days}}{\text{Tenure}_{ijl}}\right) \times 100\%$
	P3	Effective APR (EAPR)	$\text{EAPR}_{ijl} = \left(\frac{\text{Cost}_{ijl}}{\text{value}_{ijl}^{d}} \frac{365 \text{ days}}{\text{Effective tenure}_{ijl}}\right) \times 100\%$

Multiple accounts		Number of accounts	$N_i^j = \sum_{j=1}^{N^j} \mathbf{1}(N_j^d > 0)$
	MA1	Multiple account holding	$\text{Multiple accounts}_i = \mathbf{1}(N_i^j > 1)$
		Overlapping loan	$\text{overlapping}_{ijl} = \mathbf{1}(\text{disbursement date}_{ikm} < \text{disbursement date}_{ijl} < \text{repayment date}_{ikm}) + \mathbf{1}(\text{disbursement date}_{ijl} < \text{disbursement date}_{ikm} < \text{repayment date}_{ijl})$ for loan m taken by i at provider $k \neq j$.
		Simultaneous loan	$\text{simultaenous}_{ijl} = \mathbf{1}(\text{disbursement date}_{ijl} = \text{disbursement date}_{ikm})$
		Refinancing loan	$\text{refinancing}_{ijl} = \mathbf{1}(\text{disbursement date}_{ijl} = \text{repayment date}_{ikm})$
		Refinanced loan	$\text{refinanced}_{ijl} = \mathbf{1}(\text{repayment date}_{ijl} = \text{disbursement date}_{ikm})$
	MA2	Multiple borrowing	$\text{Multiple borrowing}_i = 1\left(\sum_{j=1}^{N^j}\sum_{l=1}^{N_j^a} \text{overlapping}_{ijl} + \text{simultaneous}_{ijl} > 0\right)$

	MA3	Switching borrowing	$\text{Switching borrowing}_i = (1 - \text{Multiple borrowing}_i) \times \text{Multiple accounts}_i$
Credit screening		Application record	$\text{application}_{ijlt}$
		Number of applications l by consumer i at provider j	N_{ij}^{app}
		Approvals	$\text{approved}_{ijlt} = 1(\text{loan disbursed}_{ijlt})$
	A1	Approval rate	$\text{Approval rate} = \frac{\sum_{j=1}^{J}\sum_{i=1}^{N_j^a}\sum_{l=1}^{N_{ij}^{app}} \text{approved}_{ijl}}{\sum_{j=1}^{J}\sum_{i=1}^{N_j^a}\sum_{l=1}^{N_{ijj}^{app}} \text{application}_{ijl}}$
	A2	Number of applications l by consumer i at provider j before approval	$N_{ijt}^{app} = \sum_{l}^{N_{ij}^{app}} \mathbf{1}(\text{application}_{ijlt} \,\&\, t < \tau)$ where τ is the time at which the first loan is approved.
		Covariates	A vector $\boldsymbol{x}_{ijlt}$ which encapsulates information known about applicant i at time t for loan l, at provider j.