

Signaling in Online Credit Markets

Kawai, Onishi and Uetake, by Louise G

GR 6253 class presentation, Spring 2018

- Theory has well-established predictions: asymmetric information create inefficiencies (Akerlof 1970)
- True in particular in credit markets (our own Stiglitz and Weiss 1981)
- And costly signaling can help restore efficiency (Spence 1973)
- But little empirical work.
- This paper: quantify the welfare enhancing effect of signaling in a credit market.

Empirical Context

- Prosper.com, a peer-to-peer lending website, operates millions of dollars of relatively short-term, high interest loans.
- Potential borrowers post desired loans with reserve interest rates and some characteristics.
- Potential lenders bid for amounts of loans (typically \$50) with interest rate below reserve.
- Uniform-price auction.
- Loan is only given out if completely funded.
- Very nice setting because can OBSERVE reserve interest rate and outcome.

Grade	Amount Requested		Reserve Rate		Contract Rate		Debt/Income		Home Owner		Bid Count		Obs.
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	
AA	9,710	7,384	0.131	0.046	0.096	0.033	0.21	0.39	0.80	0.40	131.5	99.3	755
A	8,723	6,626	0.165	0.060	0.127	0.045	0.23	0.14	0.55	0.50	114.0	84.4	755
B	7,347	4,858	0.216	0.063	0.164	0.046	0.27	0.34	0.56	0.50	100.9	67.6	1,023
C	4,687	2,998	0.247	0.064	0.181	0.062	0.25	0.21	0.48	0.50	53.4	38.3	1,285
D	3,578	2,380	0.280	0.064	0.210	0.066	0.24	0.17	0.26	0.44	21.6	11.7	1,022
E	1,890	1,187	0.339	0.028	0.291	0.057	0.22	0.22	0.26	0.44	44.7	30.6	392
HR	1,690	1,288	0.339	0.036	0.300	0.057	0.20	0.44	0.17	0.38	17.6	10.4	339
All	5,821	5,285	0.233	0.086	0.179	0.079	0.24	0.28	0.47	0.50	80.0	76.7	5,571

Reduced-form evidence

- Probability of being funded increases with posted reserve price.
- The posted reserve price is positively correlated with contract price.
- The reserve price is positively correlated with default rate.
- Both loan amount and contract price are positively correlated with default rate.
- Illustrates trade-off for both borrowers and lenders.
- But not super convincing.

Model - Borrowers

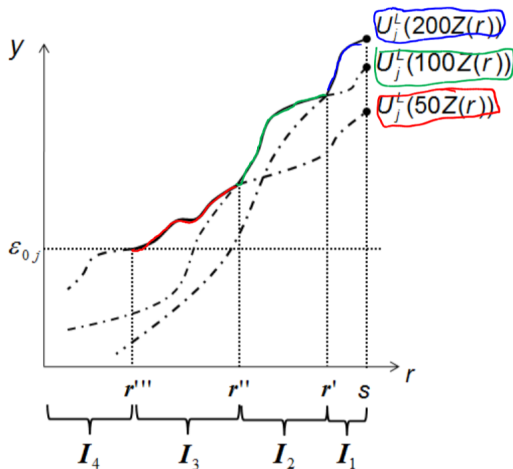
- Borrowers have some type ψ , representing their outside option.
- High types: easy to borrow outside of the platform/low cost of failure on the platform
- Trade-off for all: increasing the reserve increases cost of borrowing...
- but increases probability of getting it: more important for low types.

$$\max_{s \leq \bar{s}} Pr(s) \int V_1(r, \psi) f(r|s) dr + (1 - Pr(s))\lambda$$

- Under some SCP, no pooling besides at the maximum \bar{s} .
- So one-to-one mapping between ψ and s .
- Which means ψ can be identified!

Model - Lenders

- Do not impose rational expectations... But isomorphic (?)
- Bid the value for which they are indifferent (SPA).



Results - Borrowers

Borrowers in high categories have higher cost of default: they care about credit score.

Amount Quantile	Type Quantile	AA	A	B	C
25%	25%	10.683	7.437	2.966	3.196
	50%	10.872	7.635	3.365	3.479
	75%	10.966	8.735	3.867	4.012
50%	25%	9.999	7.085	2.944	3.041
	50%	10.302	7.229	3.207	3.424
	75%	10.595	8.013	3.726	4.031
75%	25%	7.984	5.685	2.755	3.099
	50%	8.196	5.947	2.923	3.463
	75%	8.427	6.406	3.454	3.977
All	25%	7.890	6.118	2.753	3.007
	50%	9.756	7.199	3.224	3.404
	75%	10.683	7.785	3.760	3.947

Counterfactuals

- No asymmetric information:
 - Does not change much for A borrowers
 - But changes a lot for top category (AA) and lower categories (B,C) - 13 to 16%.
 - Backward bending supply curve.
- No signaling:
 - Shows that signaling restores large chunk of welfare due to asymmetric information (90%)

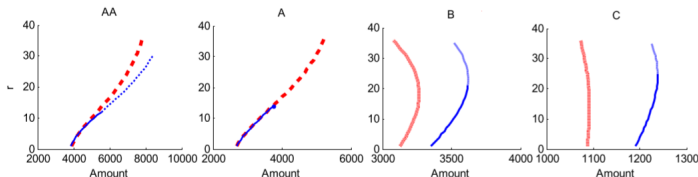


Figure 7: The Credit Supply Curve for the Borrower of the Median Type – The thick dotted curve corresponds to the credit supply curve under no signaling (i.e., pooling). The solid line corresponds to the credit supply curve under signaling, and the dotted line that lies on top of it corresponds to the credit supply curve under no asymmetric information. Borrower covariates are set to the median values.

Conclusion

- Pretty cool paper!
- Nice empirical context, original: small loans, high interest rates, high default rates, negative returns
- Typical setting where asymmetric information hurts through adverse selection and moral hazard
- BUT atypical feature of posted reserve interest rate as signaling
- Interesting that an online platform can restore that.
- Perhaps other counterfactual would have been interesting, e.g. how can we make lenders lose less money?
- It seems like signaling restores welfare but only in the short-run