Do Credit Card Companies Screen For Behavioral Biases?

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Overview

- In this paper, the authors look at the supply side of the US credit card market and study how financial institutions take advantage of their customers.

Data

- The authors use over one million individual credit card offers sent to a set of representative households in the US between 1999 and 2011 from Mintel.
- The data also has info on households' demographics.
- They also know the type of offers that customers receive through the actual offer letters.
- Using OCR they extract the hard and soft information about the offers.
  - APRs, fees, and reward programs (hard info).
  - photos, color, font size, if the information about an offer is provided at the beginning or the end of the letter (soft info)

Data – Hard Info

- Mintel collects data on approximately 4,000 households and 7,000 credit card mail campaigns monthly.
- During their sample period they have 1,014,768 mail campaigns and 168,312 different credit card offers.
- Average annual fee is $12.29, max annual fee is $500, 81.5% of the mailed offers have no annual fee.
- Average late fee is $33.83 and the max is $85, 90% of credit card offers have late.
- Average over-limit fee $29.74, 87% of the cards have over-limit fees.

Data – Soft Info

- “Size” is the maximum size of the reward programs minus the average size of all characters on every page of each credit card offer. “Size” has a mean of 4.71 mean and a standard deviation of 5.49. The maximum value of Size is 143.63
- “Color” is a dummy indicating whether the reward programs in the offer highlighted in color rather than in black and white.
- “Bold” is a dummy indicating whether the offer used bold to highlight its reward programs.
- “Picture” is the file size, and the unit is megabytes (MB). The mean of “Picture” is 0.23 MB with a 0.26 MB standard deviation.

Results

- The authors document three key results from this data
  - Less educated consumers are more likely to be offered more back-loaded or hidden fee structures that rely on low introductory (or teaser) rates and no annual fees but high penalty rates, late fees, and over-limit fees.
  - After controlling for the observable characteristics of customers, card issuers attempt to screen households based on *unobservable* characteristics.
  - Trade off between borrower sophistication and credit risk. Using a D-in-D strategy they show that when states increase UI banks target less educated consumers with inferior offers.

Comments

- It is a nice paper.
- The authors do pain staking work on collecting the contract sheets and document all the hard and soft info observed on these sheets.
- The authors are very careful and thorough.
- I believe their results because it is consistent with my priors and also a lot of the work I have done in this space on how consumers behave.
- I have a few comments for the authors, hopefully that will help alleviate questions regarding the data and findings.

Comment 1

- The authors claim, less educated consumers are more likely to be offered more back-loaded offers.
- By law the banks cannot make offers based on race gender, education levels, income levels, etc. They cannot use demographics.
- They make offers on based on the mailing address and Fico score.
- However, that does not mean they cannot infer education and income level information based on the address and fico scores.

Comment 1

- So I would suggest the authors show the correlation between
  - Education levels and addresses. Since they do not have the address they can show the correlation between education and zipcode.
  - Education levels and FICO scores.
- In other words, what the authors are documenting is a correlation between zipcode and offer type. Pooper zip codes are on average getting back loaded offers. A zipcode is 30,000 people.

Comment 1

- As econometricians they have access to the *self reported* education levels of the Mintel users.
- Do people randomly report their education or is there a bias in reporting. This has significant implications on their results.
- I do not know if the income is verified. The authors need to make it clear in the paper about the bias in these variables.
- It is unclear to me if Mintel observes *all* contracts or only *accepted* contract.
- I presume that the contract is sent to the consumers and he provides a copy to Mintel. Is there a selection bias. They only provide those contracts that they accept.

Comment 2

- From my understanding of how banks make offers, they do randomized mailings. This is documented in Agarwal el. al. paper that the response rate is 0.5%. This shows they don't know how to target customers.
- So, let me propose an alternative explanation. The bank is randomly sending both inferior and superior credit card offer letters to all zipcodes. However, there is adverse selection.
- From the time the bank collects the FICO scores and then designs a marketing campaign and sends it out and the consumer responds to the campaign it can be 3-4 months.
- So the consumer who respond to the *inferior* offer types (e.g., higher APR offer, back loaded contracts) exhibit poorer credit quality characteristics than those responding to *superior* offer types.
- This could be because higher risk consumers have fewer options for acquiring funds to smooth consumption (i.e., liquidity or credit constrained). And therefore, they have a higher reservation credit card interest rate or contract terms. They know their credit quality has deteriorated in these 4 months and so they know the bank will reject them so they might as well accept the inferior offer.

Offer Type	Non-Responders Responders	Frequency	Response Rate (%)	Balance Transfer ($)	Credit Line ($) All Cards	Utilization (%) All Cards	Account Age	30+DPD prior 12 months	FICO Score
A1	Non-Responders	644624		0	21068	8	131	0.08%	773
	Responders	1746	0.27%	1503	19557**	13**	83**	0.31%**	742**
A2	Non-Responders	149800		0	20409	9	123	0.04%	772
	Responders	843	0.56%	1926	23506**	15**	92**	0.12%**	744**
A3	Non-Responders	154090		0	22429	9	137	0.04%	772
	Responders	458	0.30%	1922	22100	15**	94**	0.15%**	744**
B1	Non-Responders	542666		0	21354	8	132	0.18%	773
	Responders	1058	0.19%	363	15163**	14**	80**	0.28%**	740**
B2	Non-Responders	150118		0	20369	9	122	0.13%	772
	Responders	708	0.47%	538	18553**	16**	82**	0.10%**	742**
C1	Non-Responders	493903		0	21868	8	135	0.07%	773
	Responders	957	0.19%	2464	27772**	14**	94**	0.19%**	743**
C2	Non-Responders	150076		0	20400	9	122	0.03%	772
	Responders	678	0.45%	3078	29479**	17**	98**	0.11%**	743**
	T-test for Diff A1 & A2			-3.60	-4.45	-2.60	-2.79	-5.28	-1.24
	T-test for Diff A1 & A3			-2.87	-2.35	-2.12	-2.62	-3.89	-1.01
	T-test for Diff B1 & B2			-5.61	-4.05	-2.06	-0.53	-2.77	-1.05
	T-test for Diff C1 & C2			-3.41	-1.26	-3.32	-0.95	-2.13	0.00

Offer #	Rejected	Balance	FICO	Past	Credit Card	Other Credit	Credit Line	Credit Line	Credit Line	Total Revolving	Account		
	Booked	Transfer Amt	Score	Delinquencies	Utilization	Utilization	Mortgage	All NonMortgage	All Cards	Balance	Age	Frequency	
A1	Rejected	0	724	0.44%	16	44	34991	59298	14666	4581	66	912	
	Booked	1975	746**	0.27%**	12**	54**	52753**	89116**	21091**	4130	88**	417	31.3770%
A2	Rejected	0	726	0.27%	20	57	47369	80422	19071	5650	82	551	
	Booked	2329	747**	0.09%**	14**	60	64230**	102364**	24435**	4703**	94**	146	20.9469%
A3	Rejected	0	723	0.33%	21	48	20771	57838	14880	5053	69	278	
	Booked	2383	749**	0.11%**	13**	56	62725**	94773**	23865**	4491	100**	90	24.4565%

	Frequency			FICO Score			t-stat	t-stat	Behavior Score			t-stat	t-stat
Offer Type	at booking	at 12Mth	at 24Mth	at booking	at 12Mth	at 24Mth	1st 12Mth	2nd 12Mth	at 1Mnth	at 12Mth	at 24Mth	1st 12Mth	2nd 12Mth
A1	1329	729	645	744	740	737	-0.96	-0.74	722	711	701	-2.25	-2.17
A2	697	627	509	745	743	737	-1.61	-0.63	742	740	740	-0.72	0.05
A3	368	318	259	746	743	739	-0.91	-0.45	731	725	721	-1.04	-1.60
B1	765	702	658	743	737	735	-0.43	-0.34	732	721	712	-2.35	-1.91
B2	613	588	562	744	740	737	-0.37	-0.43	741	739	734	-0.54	-0.20
C1	727	501	395	744	741	738	-1.08	-0.92	730	721	710	-2.45	-2.06
C2	560	479	462	743	739	739	-0.09	-1.03	739	736	737	-0.78	0.24

Comment 2

- The tables above show that the consumers who respond to the mailings have lower FICO scores.
- Also, the consumer FICO scores across the various mailings is similar.
- Banks routinely reject over 60% of the consumers who reply to the campaign. Moreover rejection rates are higher for superior offers like A2 and A3 campaigns. So, consumers who don't want to be rejected would apply to the inferior offers.
- *So, I think if we should see the effect the authors have in mind of banks selecting customer type based on their demographics, then we should see it at this stage.*
- But, still the behaviour scores are lower for inferior offers. So the borrower who know their type are choosing worst offers.
- This study also confirms that these consumers default more on their credit cards ex-post.

Comment 3

- The authors claim less educated customers are offered contracts with no annual fees but high penalty rates, late fees, and over-limit fees.
- However, 81%, 85% and 87% of the contracts have annual fees, late fees, and over-limit fees.
- The fraction of educated consumers (graduated college) in the data is around 40%.

Comment 4

- I find the soft info (size, color, bold, picture) as the most exciting part of the paper.
- The cleanest thought experiment I can think of is to show that two consumers (one with low education and one with high education) receive offers that are different in terms of soft information.
- Specifically, if the authors can show that a given bank, for a given campaign, sends two different offers to these two groups based on soft info, then it will be convincing.
- All the current regressions control for bank FE. I would like the authors to control for campaign FE.

Comment 4

- I can imagine that different campaigns are run by different managers and they emphasize the colors, size, etc. differently. Even they target different markets and so have different hard info criteria.
- So having a campaign FE is important.
- If the authors have some pictures of offers from same campaign by one bank to high and low educated people showing the different in both hard and soft info that would be most convincing.

Conclusion

- The paper examines an interesting and important question.
- Ever since the financial crisis, there has been intense scrutiny of the banks targeting sub-prime consumers in the mortgage market. (E.g. creation of CFPB).
- This paper confirms that banks do target low income/low education consumers (low FICO consumers).
- Has significant policy implications.