

The Effects of Stock Ownership on Individual Spending, Investments, and Loyalty

Internet Appendix – For Online Publication

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Appendix 1 Stock ownership and self-reported loyalty: Survey evidence

In this appendix, we analyze the responses to four surveys sent to users in 2019 and 2020. The surveys were designed and administered by the Bumped team. The number of respondents varies across the surveys, ranging from 455 to 672 respondents per survey. The specific questions in each survey are also different, which is why the number of users responded to each survey question ranges from 1,160 to 2,217. We can use these surveys to understand the characteristics of users and their attitudes toward stock ownership and financial markets. For exposition purposes, we modify the original numbering of the questions. Survey responses do not contain identifiers to link them to the transaction data, and take place only after users sign up to the platform. As a result, we cannot apply our identification strategy to analyze the survey data. We nevertheless argue that the responses are informative of the financial sophistication of Bumped users and of the reasons behind the increases in spending in response to receiving stock rewards.

The first question asks users about their use of different types of financial accounts outside of the rewards platform.

Q1. Do you own stock outside of Bumped? If so, where?

A1.1 Employer-sponsored retirement funds (401k, IRA, etc.)

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- A1.2 Investments through other apps (Robinhood, Stash, etc.)
- A1.3 Traditional or managed investment account
- A1.4 Something else

The top left panel of Figure [A1](#) shows the fractions of users who responded "yes" to each of the 4 options presented. The top right panel of Figure [A1](#) shows the distribution of users according to the number of positive answers provided, which is indicative of the number of different financial accounts held. We can see that the vast majority of survey respondents have at least one financial account outside of the rewards platform. The majority have between 2 and 4 accounts, suggesting that their exposure to the stock market is not limited to their stock rewards.

The second question asks users about their attitudes toward the brands for which they received stock rewards.

Q2. Since signing up for Bumped... (select all that apply)

- A2.1 I feel more loyal to the brands that I get rewards from
- A2.2 I feel a more positive attachment toward the brands I get rewards from
- A2.3 I have told my friends about companies I own through Bumped
- A2.4 I have shopped less with competitors of companies I own through Bumped
- A2.5 I have paid more for something because I am an owner of the company through Bumped
- A2.6 I have traveled farther or gone out of my way to shop at companies I own through Bumped
- A2.7 None of the above
- A2.8 Something else (free text)

The top panel of Figure [A2](#) shows that, since starting to use the app, more than 65% of survey respondents report feeling more loyal toward the brands they receive rewards from, 40% report feeling a more positive attachment towards those brands, almost 45% of users shop less with competing brands, 16% report paying more because they are owners of the brand, and 46% report going out of their way or traveling longer distances to shop on brands they own. The responses are consistent with our spending results and with the results of [Aspara \(2009\)](#). Overall, these responses suggest that stock ownership leads to increased brand loyalty, which we argue explains the large spending response to stock rewards.

The third question asks users about their likelihoods of investing outside of Bumped in the future as a result of owning stock through Bumped. The bottom part of Figure [A1](#) shows that more than 52% of users responded that they are more likely to invest outside of Bumped in the future as a result of owning stock through Bumped. Again, these results corroborate our empirical findings that receiving stock rewards leads to more engagement with the stock market in general.

Q3. Does owning stock through Bumped make you more likely to invest outside of Bumped in the future?

A3.1 No

A3.2 Maybe

A3.3 Yes

Users were also asked in an open-ended format to explain why they feel more excited about stock rewards compared to traditional rewards. Here, we quote some of the answers that highlight the impact of ownership on loyalty and brand preferences.

"Drives much more loyalty. Impacts behavior more."

"I like knowing that I own shares in the companies I shop at, it enhances my loyalty."

"I feel attached to a company and feel as if it is a mutual benefiting relationship. As I help the business out, they provide something in return that directly correlates with their success."

"I feel like I am part of the company when I own shares of it. I like to benefit from their success."

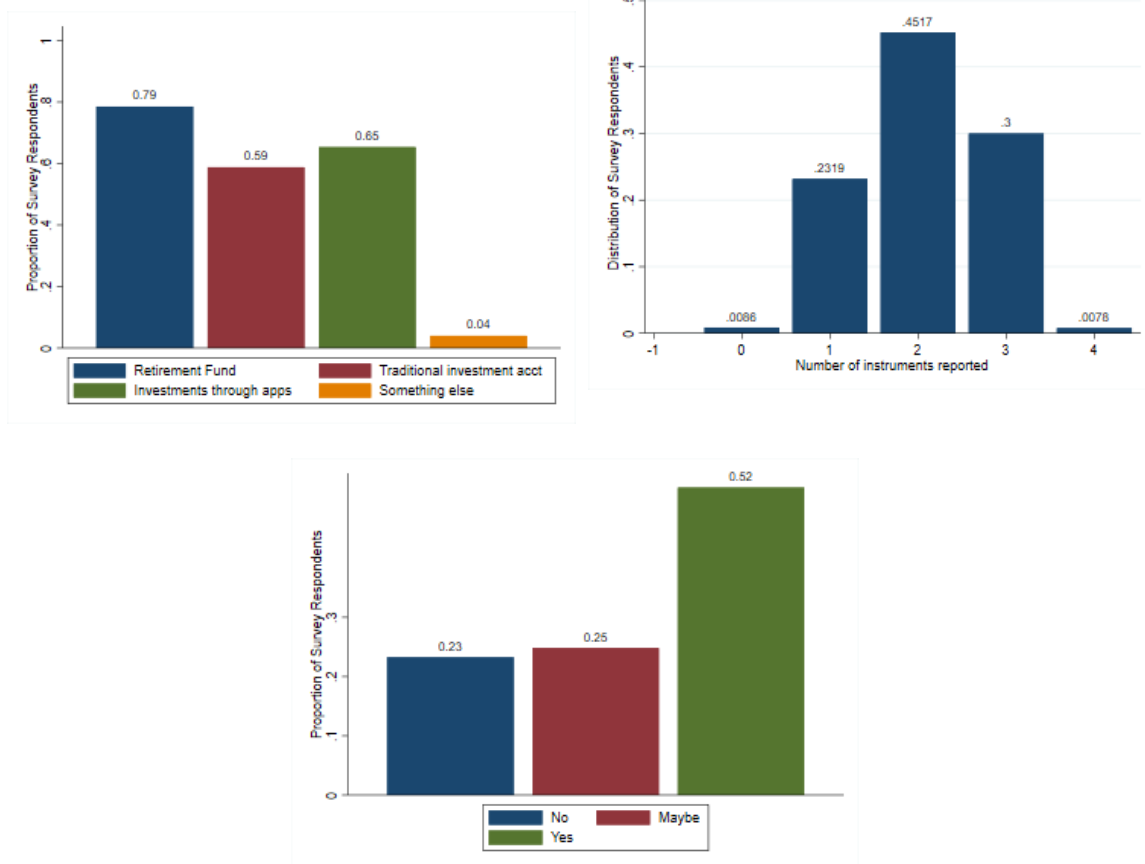


Figure A1: The top left figure shows the responses to a survey of 1,160 users who were asked about their investing experience. The survey question is: "Do you own stock outside of Bumped? If so, where? 1. Employer-sponsored retirement funds (401k, IRA etc), 2. Traditional or managed investment account, 3. Investments through other apps (Robinhood, Stash etc), 4. Something else." Since users were allowed to select more than one category, the top right panel shows the distribution of number of different categories (or accounts) selected.

The bottom figure shows responses of 1,160 users who were asked the following question: "Does owning stock through Bumped make you more likely to invest outside of Bumped in the future? 1. No, 2. Maybe, 3. Yes." Users were allowed to select one answer.

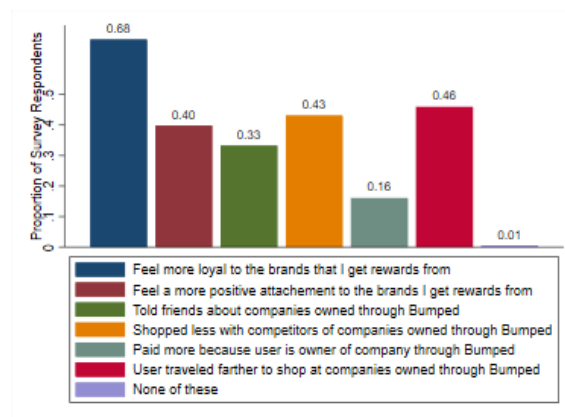


Figure A2: The top figure shows the responses of 1,127 users who were asked to select all that applies for the following question: "Since signing up for Bumped... 1. I feel more loyal to the brands that I get rewards from, 2. I feel a more positive attachment to the brands I get rewards from, 3. I have told my friends about companies I own through Bumped, 4. I have shopped less with competitors of companies owned through Bumped, 5. I have paid more for something because of owning a company through Bumped, 6. I have traveled farther or gone out of my way to shop at companies owned through Bumped, 7. None of the above 8. Something else." Users were allowed to select any number of answers.

Appendix 2 Additional Figures and Tables



Figure A3: Users by 5-digit zip code in the US.

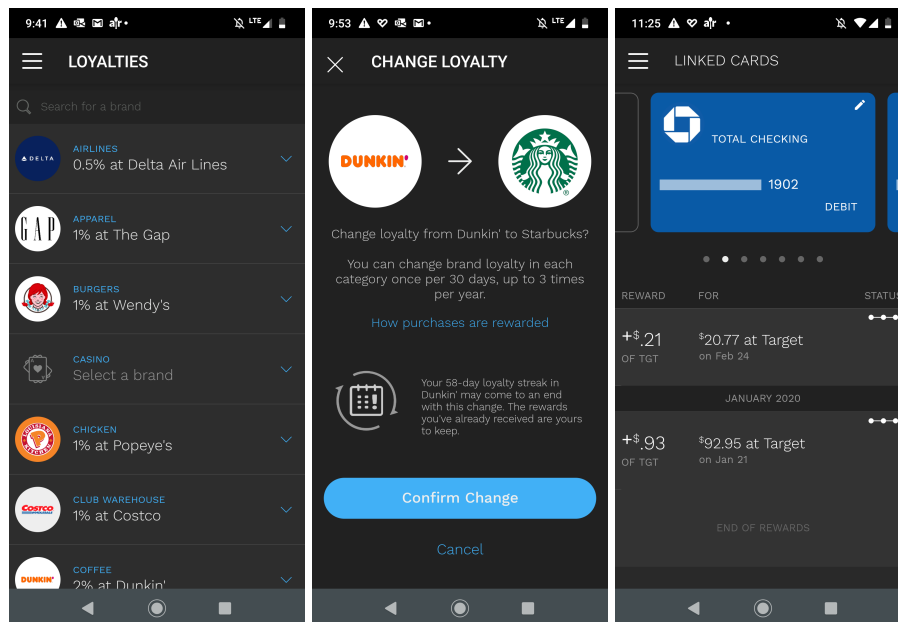


Figure A4: The Bumped app: screenshots of company selection (99 companies in 34 retail categories), switching companies, and linked bank accounts and credit card screens.

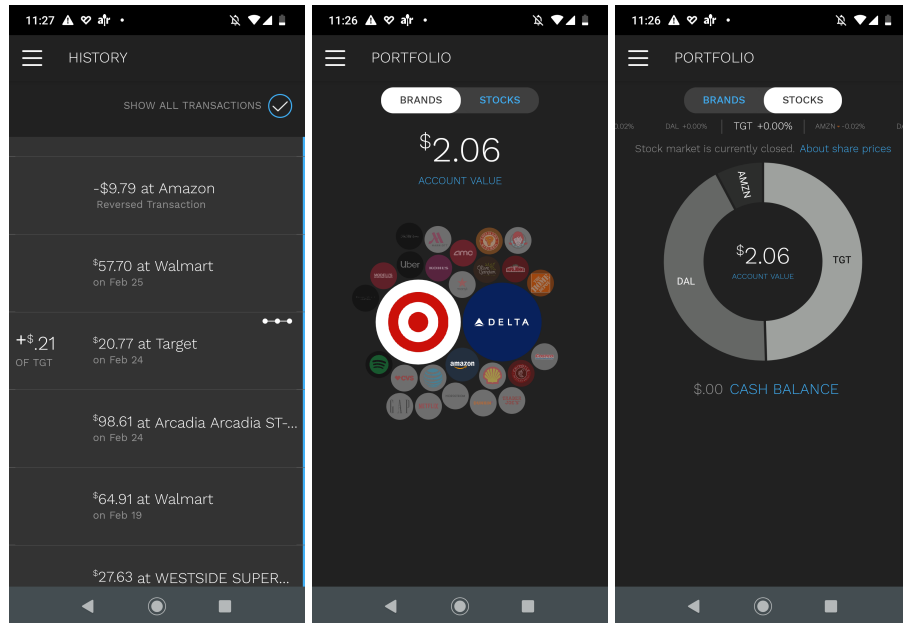


Figure A5: The Bumped app: screenshots of transactions from all linked cards (that are eligible or not) and overview of the user's portfolio.

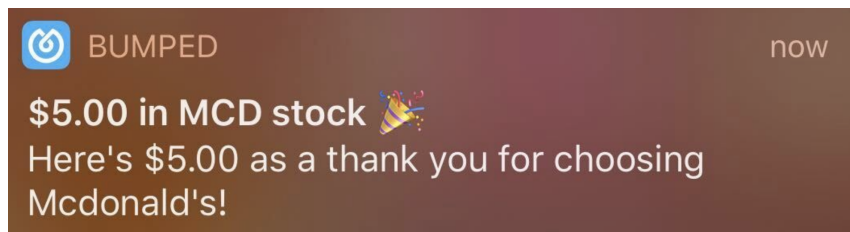


Figure A6: Stock grant notification received by users, push notification.

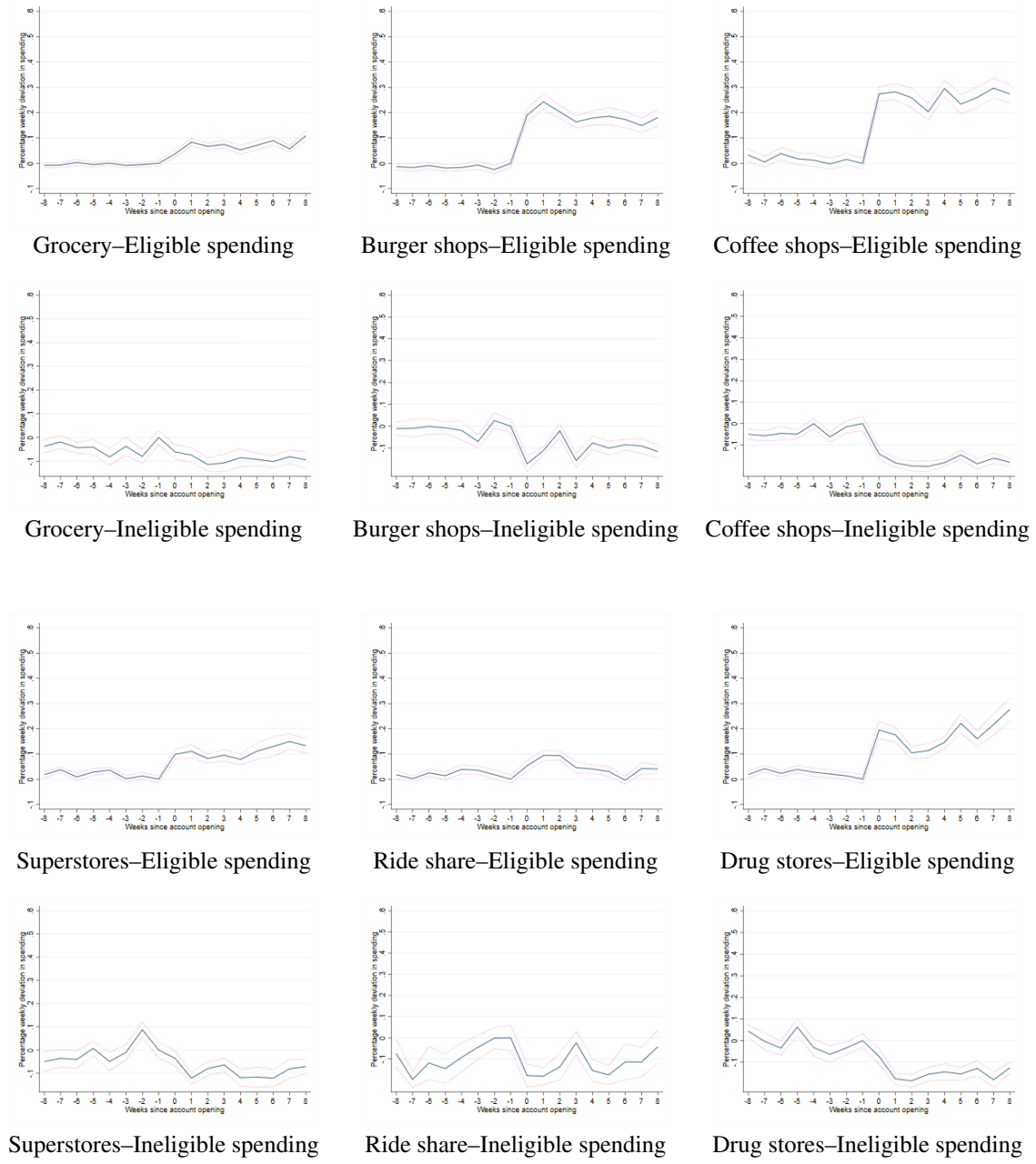


Figure A7: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for the six most popular rewards categories, which are grocery, burger shops, coffee shops, superstores, ride share, and drug stores. Standard errors are shown as the dotted lines and clustered at the individual and week levels. For ride share we consider only accounts opened after the category was introduced (see Subsection 4.4). The F-statistic for the joint test that all pre-account-opening coefficients are zero: F=0.411 (Grocery–Eligible), F=1.758 (Grocery–Ineligible), F=0.670 (Burger shops–Eligible), F=1.365 (Burger shops–Ineligible), F=1.161 (Coffee shops–Eligible), F=0.953 (Coffee shops–Ineligible), F=3.428 (Superstores–Eligible), F=1.995 (Superstores–Ineligible), F=3.218 (Ride share–Eligible), F=5.261 (Ride share–Ineligible), F=1.453 (Drug stores–Eligible), F=1.807 (Drug stores–Ineligible).



Figure A8: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of actually rewarded spending transactions as a fraction of all eligible spending transactions (spending rewarded/eligible spending). The tercile thresholds are 0.55 and 0.85. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistics for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=1.284$ (p-value=0.261) for small fraction rewarded, $F=2.096$ (p-value=0.046) for medium fraction rewarded, and $F=0.596$ (p-value=0.759) for large fraction rewarded.



Figure A9: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of reward amount as a percentage of eligible spending. The tercile thresholds are 0.8% and 1.3%. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=0.939$ (p-value=0.477) for small rewards, $F=0.657$ (p-value=0.708) for medium rewards, and $F=1.054$ (p-value=0.395) for large rewards.

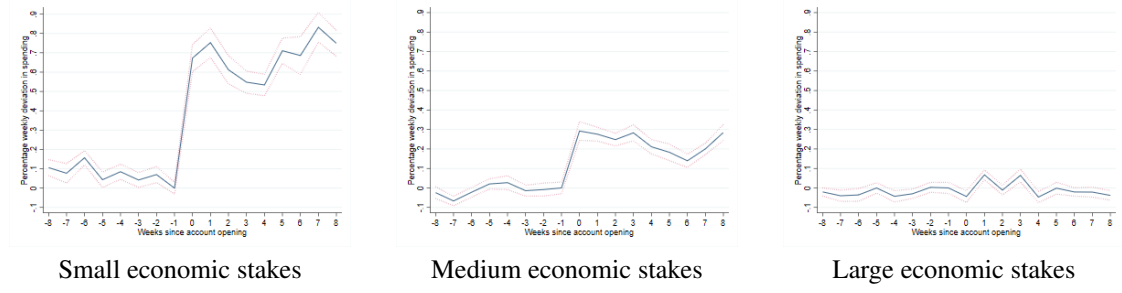


Figure A10: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of economic stakes. Economic stakes are defined as hypothetical rewards implied by weekly spending over the 8 weeks before account opening. For each user we calculate average weekly spending on eligible stores over the 8 weeks previous to the intervention, and multiply that by the reward rate. The tercile thresholds are 14 cents and 57 cents per week. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=2.688$ (p-value=0.011) for low economic stakes, $F=1.839$ (p-value=0.083) for medium economic stakes, and $F=0.791$ (p-value=0.596) for large economic stakes.

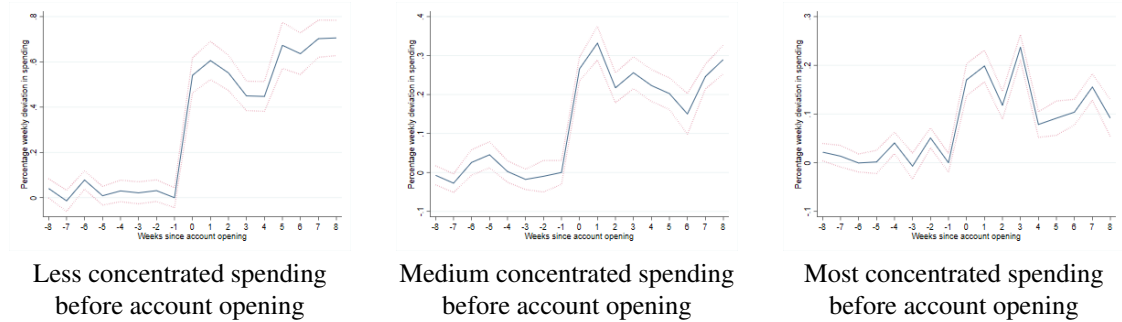


Figure A11: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of the mean ratio of weekly eligible spending divided by ineligible spending before account opening. The tercile thresholds are 12.3% and 44.5%. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=1.645$ (p-value=0.126) for small rewards, $F=0.938$ (p-value=0.479) for medium rewards, and $F=1.326$ (p-value=0.240) for large rewards.

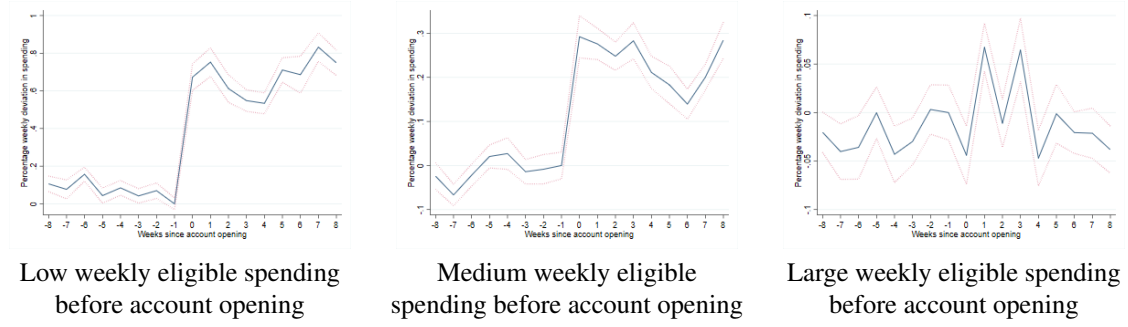


Figure A12: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of weekly eligible spending in the 8 weeks before account opening. The tercile thresholds are 10.7\$ and 39.4\$. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=2.688$ (p-value=0.011) for low weekly eligible spending pre-account opening, $F=1.839$ (p-value=0.083) for medium weekly eligible spending pre-account opening, and $F=0.791$ (p-value=0.596) for large weekly eligible spending pre-account opening.

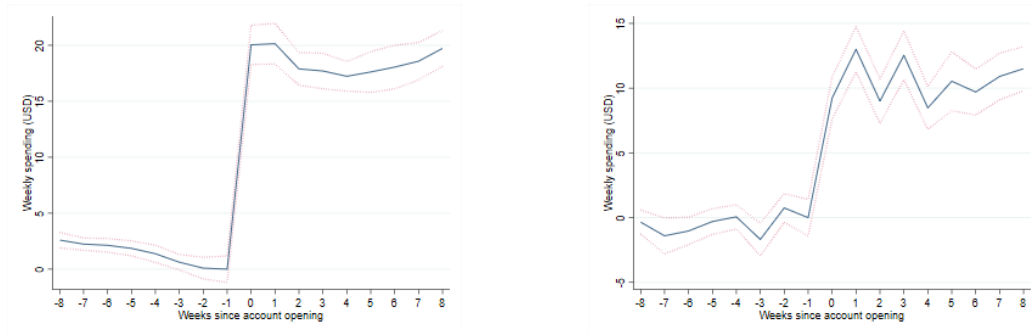


Figure A13: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for weekly eligible spending in categories in which the user did not spend at eligible stores before account opening versus total eligible spending. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the left-hand-side panel is 1.033 with a p-value of 0.410, while the F-statistic for the right-hand-side panel is 2.284 with a p-value of 0.030.

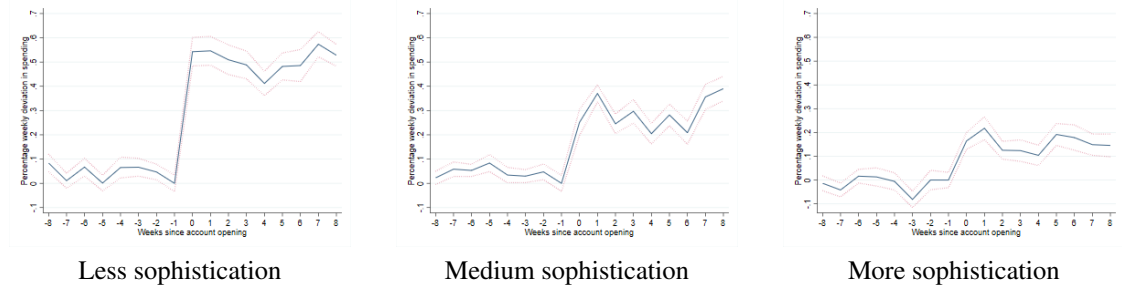


Figure A14: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of the fraction of spending categories in which they select the brand with highest spending during the 8 weeks previous to account opening. The tercile thresholds are 0.27 and 0.40. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=2.330$ (p-value=0.027) for less, $F=1.481$ (p-value=0.177) for medium, and $F=1.326$ (p-value=0.020) for more sophistication.

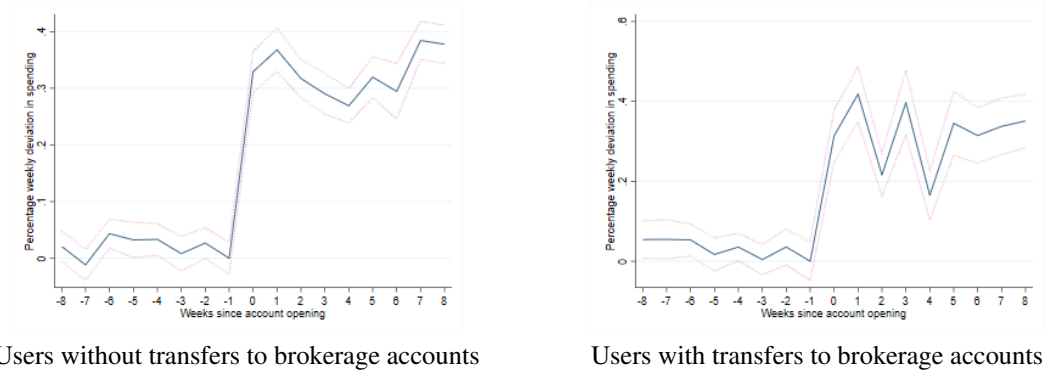
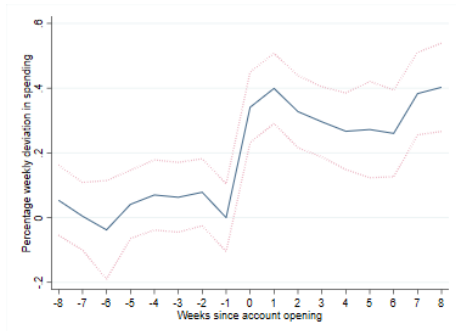
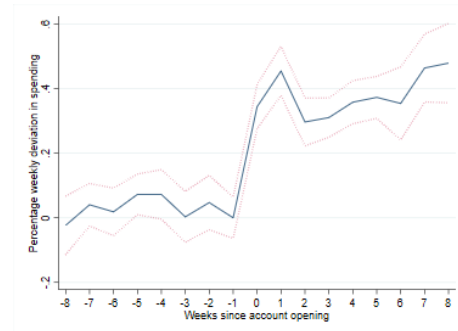


Figure A15: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) for users for who we (do not) observe transfers to other brokerage accounts. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the two panels are: $F=0.708$ (p-value=0.665) for users without transfers, $F=1.989$ (p-value=0.059) for users with transfers.

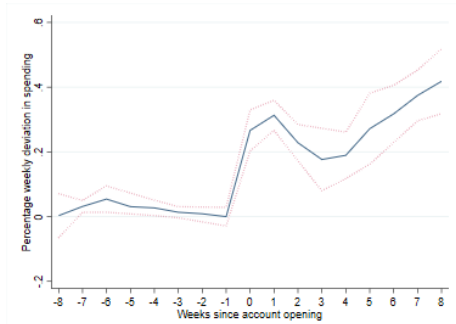


Eligible spending in companies popular on Robinhood

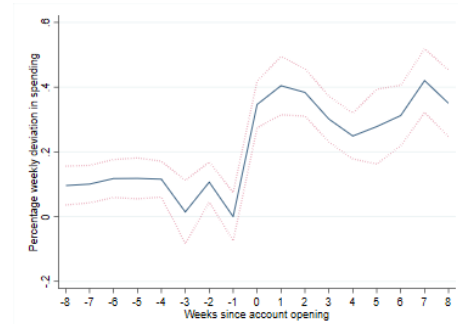


Eligible spending in companies unpopular on Robinhood

Figure A16: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) in companies that are popular (more than the median number of users hold the stock) on Robinhood in that week or unpopular (less than the median number of users hold the stock). We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the two panels are: $F=0.272$ (p-value=0.964) for popular companies on Robinhood, $F=0.248$ (p-value=0.972) for unpopular companies on Robinhood.



Eligible spending in companies with headquarters located close to user



Eligible spending in companies with headquarters located far away from user

Figure A17: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) in companies with headquarters that are close to users' home zip codes (less than the median distance of each user's home zip code to all the companies' headquarter zip codes that the user elected) in that week or companies with headquarters that are far away from the users home zip codes (more than the median distance of a user's home zip code to all the companies' headquarter zip codes that the user elected). We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for the two panels are: $F=0.093$ (p-value=0.999) for close companies, $F=0.526$ (p-value=0.814) for far companies.

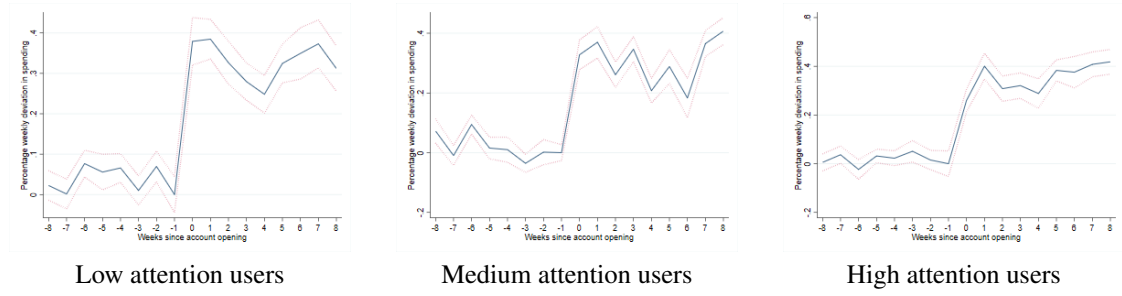


Figure A18: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for three terciles of user attention, defined by the login counts per user in the 8 weeks after account opening. The tercile thresholds are 9 and 19 login counts per user. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistics for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=1.477$ (p-value=0.178) for low attention users, $F=2.350$ (p-value=0.026) for medium attention users, and $F=0.641$ (p-value=0.722) for high attention users.

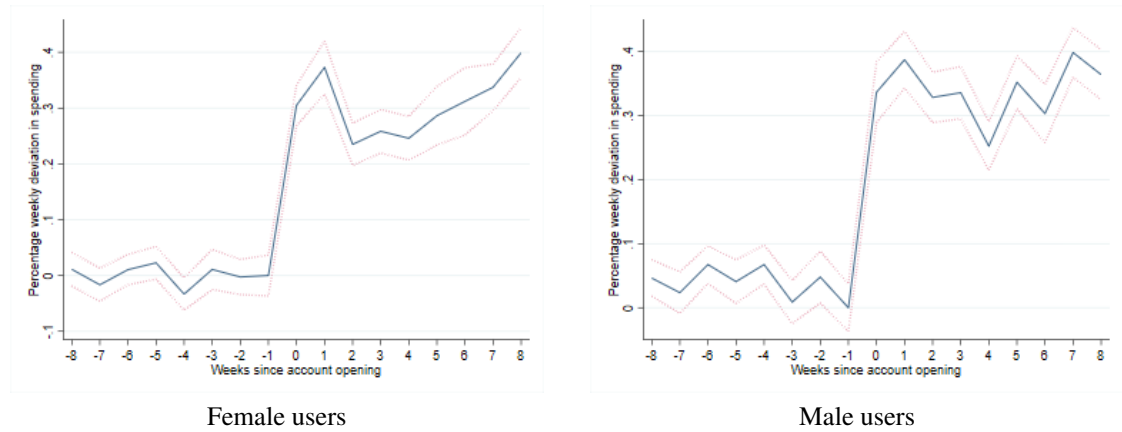


Figure A19: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) based on whether the user is male or female. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic for the joint test that all pre-account-opening coefficients are zero for female users is 0.863 and the p-value is 0.537, while the F-statistic and p-value for male users is 0.981 and 0.447 respectively.

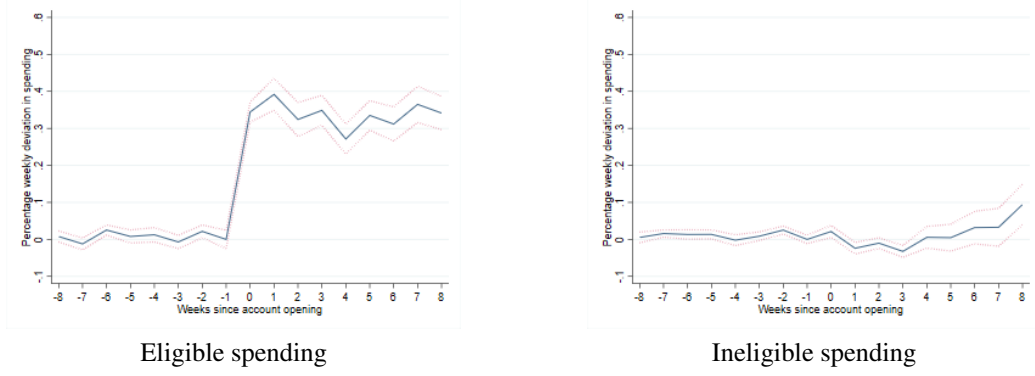


Figure A20: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for both eligible and ineligible spending (the percentage deviation from the individual-level mean) with a two-stage DiD estimator (Gardner, 2022). We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels.

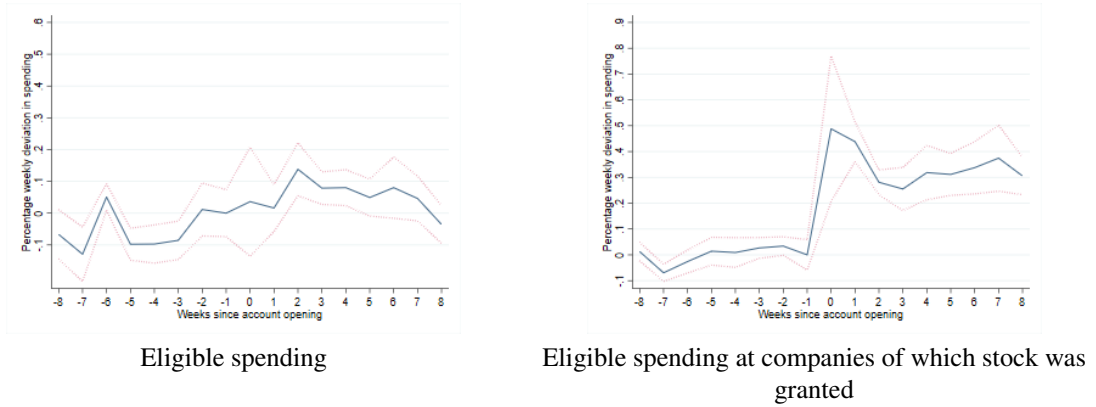


Figure A21: This figure shows the coefficient estimates β_{BG}^{τ} in Specification (4) for both eligible overall spending and eligible spending at the companies' stores of which users received stock grants, i.e., the DiD incremental effect of grant receivers on spending. This specification adjusts for staggered treatment effects using a stacked DiD approach (Cengiz et al., 2019; Dooley and Gallagher, 2021). Standard errors are shown as the dotted lines and clustered at the individual and week levels.

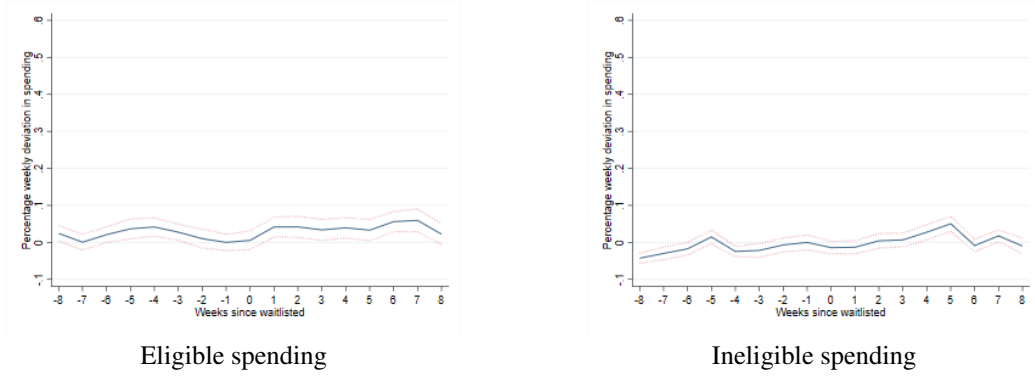


Figure A22: This figure shows the coefficient estimates $\beta_{waitlist}^{\tau}$ in Specification (6) for both eligible and ineligible spending (the percentage deviation from the individual-level mean). We control for individual and week-by-year fixed effects and consider 8 weeks before and after individuals signed up for the waitlist. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistic (p-value) for the joint test that all pre-account-opening coefficients are zero for the left-hand-side panel is 0.680 (0.689), while the F-statistic (p-value) for the right-hand-side panel is 1.433 (0.195).

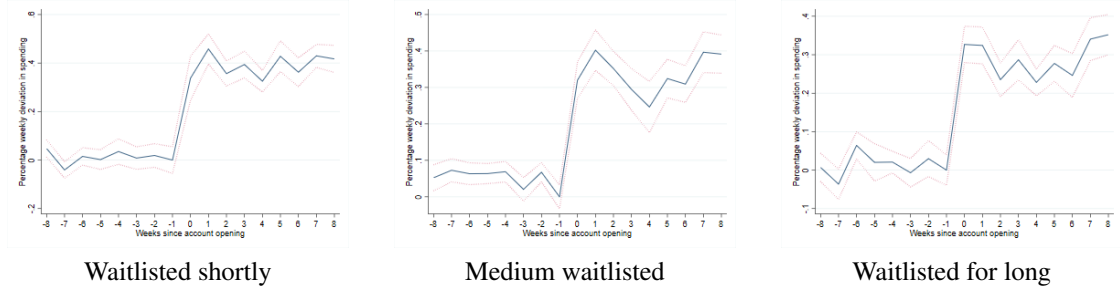


Figure A23: This figure shows the coefficient estimates β_{Bumped}^{τ} in Specification (2) for eligible spending (the percentage deviation from the individual-level mean) split into three terciles of time spent being waitlisted. The tercile thresholds are 11 and 20 weeks. We control for individual and week-by-year fixed effects and consider 8 weeks before and after receiving the account. Standard errors are shown as the dotted lines and clustered at the individual and week levels. The F-statistics for the joint test that all pre-account-opening coefficients are zero for the three panels are: $F=2.406$ (p-value= 0.022) for short waitlist, $F=3.581$ (p-value=0.001) for medium waitlist, and $F=0.789$ (p-value=0.597) for long waitlist.

Table A1: Estimation results of ATM withdrawals post account opening

ATM withdrawals				
	ATM withdrawal ratio	ATM withdrawal amount	Log ATM withdrawal amount	Likelihood ATM withdrawal
Post 8 weeks	0.078*** (0.016)	-0.806 (1.094)	0.049*** (0.013)	0.005** (0.002)
Post more than 8 weeks	-0.057*** (0.020)	-0.518 (1.178)	-0.012 (0.015)	-0.001 (0.002)
User fixed effects	✓	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓	✓
Observations	653530	657082	657082	657082
R squared	0.096	0.243	0.361	0.277

Standard errors in parantheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: In Column (1), we regress ATM withdrawal amounts on a post 8 weeks after account opening dummy, which takes a value of 1 for transactions during or within 8 weeks of account opening, and on a post more than 8 weeks dummy, which takes a value of 1 for transactions more than 8 weeks post account opening and zero otherwise. Column (1) uses the percentage deviation in ATM withdrawals (relative to the individual-level average) as the outcome variable, Column (2) uses the USD amounts in ATM withdrawals, and Column (3) uses the log of USD amounts in ATM withdrawals. User fixed effects and week-by-year fixed effects are included. Standard errors are double-clustered at the user and week levels.

Table A2: Summary statistics of users, initial sample pre data cleaning

	Mean	Std dev	25th percentile	50th percentile	75th percentile
Age	36	9.6	29	34	41
Male	.68	.47	0	1	1
Days from waitlist to open	146	106	73	119	181
Weekly user logins	2	2.8	1	1.3	1.8
Number of transactions	733	749	262	561	1,000
Number of cards linked	2.4	1.9	1	2	3
Total weekly spending	434	2,018	159	294	488
Weekly eligible spending	64	229	11	35	80
Weekly ineligible spending	370	1,997	125	240	403
Grant weekly eligible spending	7.6	29	0	1.2	6.9
Grant weekly ineligible spending	24	500	0	0	0
Weekly eligible spending - grocery	12	34	0	0	6.2
Weekly ineligible spending - grocery	16	58	0	3.1	17
Weekly eligible spending - superstores	9.8	60	0	0	2.5
Weekly ineligible spending - superstores	20	77	.22	4.6	20
Weekly eligible spending - ride sharing	4.1	14	0	0	2.2
Weekly ineligible spending - ride sharing	6	15	0	.37	5
Total rewards	13	23	1.1	4.4	16
Weekly rewards	.83	1.1	.27	.55	1.1
Total rewarded/eligible	.89	.18	.85	.96	1
Weekly rewarded/eligible	.92	.13	.91	.97	1
Weekly ACH transfers	147	912	0	0	0
Weekly ATM withdrawals	57	256	0	0	0
Observations	12628				

Notes: This table includes all Bumped users, which are 12,628. The total number of transactions, and spending (in USD), calculated per user include amounts before and after opening the app. Rewards are in USD. Spending only includes transactions that were classified as belonging to a certain company (551 different companies are in the final dataset (in 34 retail categories) of which 99 can be selected to be rewarded). Spending does not include ATM withdrawals. ATM withdrawals are expressed as positive numbers. ACH transfers include all outgoing ACH transfers that are classified as finance or investments, belonging to an identifiable broker, or belonging to an investment services app. The rewards statistics only include the weeks post account opening.

Table A3: Summary statistics of users who received a stock grant, initial sample pre data cleaning

	Mean	Std dev	25th percentile	50th percentile	75th percentile
Age	37	9.4	30	35	42
Male	.69	.46	0	1	1
Days from waitlist to open	200	88	127	186	271
Weekly user logins	2.1	2.6	1	1.4	2
Number of transactions	621	609	193	461	880
Number of cards linked	2.2	1.7	1	2	3
Total weekly spending	501	1,572	202	334	512
Weekly eligible spending	68	160	17	41	81
Weekly ineligible spending	433	1,556	164	277	429
Grant weekly eligible spending	24	67	1.8	9.5	26
Grant weekly ineligible spending	202	1,438	54	99	173
Weekly eligible spending - grocery	19	46	0	.2	18
Weekly ineligible spending - grocery	16	107	0	2.5	14
Weekly eligible spending - superstores	0	0	0	0	0
Weekly ineligible spending - superstores	38	117	4.1	17	44
Weekly eligible spending - ride sharing	3.8	11	0	0	1.7
Weekly ineligible spending - ride sharing	3.8	11	0	.1	3
Total rewards	16	20	5.7	9.9	22
Weekly rewards	.77	1.5	.27	.52	.94
Total rewarded/eligible	.9	.17	.89	.97	1
Weekly rewarded/eligible	.93	.13	.91	.97	1
Weekly ACH transfers	154	1,002	0	0	0
Weekly ATM withdrawals	31	146	0	0	0
Total grant amount	9.6	3.9	5	10	10
Observations	1500				

Notes: Out of the 12,628 users enrolled in Bumped, 1,500 users were also part of the grant promotion program. The total number of transactions and spending (in USD) are calculated per user and include amounts before and after account opening. Spending only includes transactions that were classified as belonging to a certain company (551 different companies are in the final dataset (in 34 retail categories) of which 99 can be selected to be rewarded). Rewards and grants are in USD. The rewards statistics only include the weeks post account opening.

Table A4: Estimation results of Bumped users' spending amounts on a post account opening interacted with a dummy if users received a grant

	All spending			Spending in granted companies' stores
	Eligible	Ineligible	Total	Eligible
Post 8 weeks	16.648*** (1.137)	1.458 (3.140)	18.238*** (3.075)	
Post more than 8 weeks	16.540*** (1.012)	-14.111*** (3.812)	3.269 (4.239)	
Post 8 weeks				1.990*** (0.124)
Post 8 weeks times grant recipient				2.092*** (0.390)
Post more than 8 weeks				1.382*** (0.142)
Post more than 8 weeks times grant recipient				2.562*** (0.428)
User fixed effects	✓	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓	✓
Observations	657082	657082	657082	657082
R squared	0.381	0.341	0.374	0.353

Standard errors in parantheses. *** p<0.01, ** p<0.05, * p<0.1

Notes: In these variants of Specifications (2) and (4), we regress eligible and ineligible spending overall and specifically in granted companies' stores on a post 8 weeks dummy, which takes value 1 for transactions during or within 8 weeks of account opening or receiving a grant, and on a post more than 8 weeks dummy, which takes value 1 for transactions more than 8 weeks post account opening or receiving the grant and 0 otherwise. For spending in granted companies' stores, we interacted the post dummies with a dummy for whether a user received a grant. User fixed effects and week fixed effects are included. Standard errors are double-clustered at the user and week levels.

Table A5: Estimation results of Bumped users' log spending amounts on a post account opening interacted with a dummy if users received a grant

	All spending			Spending in granted companies' stores
	Eligible	Ineligible	Total	Eligible
Post 8 weeks	0.624*** (0.021)	0.069*** (0.017)	0.177*** (0.016)	
Post more than 8 weeks	0.492*** (0.023)	-0.069*** (0.021)	0.044** (0.020)	
Post 8 weeks				0.231*** (0.011)
Post 8 weeks times grant recipient				0.173*** (0.032)
Post more than 8 weeks				0.165*** (0.013)
Post more than 8 weeks times grant recipient				0.216*** (0.035)
User fixed effects	✓	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓	✓
Observations	657082	657082	657082	657082
R squared	0.401	0.311	0.329	0.382

Standard errors in parantheses. *** p<0.01, ** p<0.05, * p<0.1

Notes: In these variants of Specifications (2) and (4), we regress log eligible and ineligible spending overall and specifically in granted companies' stores on a post 8 weeks dummy, which takes value 1 for transactions during or within 8 weeks of account opening or receiving a grant, and on a post more than 8 weeks dummy, which takes value 1 for transactions more than 8 weeks post account opening or receiving the grant and 0 otherwise. For spending in granted companies' stores, we interacted the post dummies with a dummy for whether a user received a grant. Note that we keep spending amounts between 0 and 1 as absolute numbers. User fixed effects and week fixed effects are included. Standard errors are double-clustered at the user and week levels.

Table A6: Reweighted estimation results of Bumped users' ratio of spending, spending amounts, and log spending amounts on a post account opening dummy

All spending			
	Eligible spending ratio	Eligible spending amount	Eligible spending log
Post 8 weeks	0.447*** (0.029)	13.044*** (0.968)	0.626*** (0.031)
Post more than 8 weeks	0.545*** (0.037)	10.577*** (1.009)	0.450*** (0.033)
User fixed effects	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓
Observations	349666	350316	350316
R squared	0.146	0.271	0.331

Standard errors in parantheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: In these variants of Specification (2), we perform a weighted regression of the ratio relative to own mean, amounts, and log of eligible spending on a post 8 weeks dummy, which takes value 1 for transactions during or within 8 weeks of account opening, and on a post more than 8 weeks dummy, which takes value 1 for transactions more than 8 weeks post account opening and 0 otherwise. Note that we keep spending amounts between 0 and 1 as absolute numbers. User fixed effects and week fixed effects are included. Standard errors are double-clustered at the user and week levels. All estimates are weighted at a user level by age, sex, income, and state of residence to match CPS aggregate figures for 2019.

Table A7: Estimation results of Bumped users' eligible spending ratios on a post account opening for various splits of rewards as a percentage of eligible spending

Average reward divided by eligible spending:	> 0% and < 0.5%	$\geq 0.5\%$ and < 1%	$\geq 1\%$ and < 1.5%	$\geq 1.5\%$ and < 2%	$\geq 2\%$
Eligible spending ratio					
Post 8 weeks	0.356*** (0.049)	0.396*** (0.026)	0.425*** (0.026)	0.390*** (0.029)	0.442*** (0.051)
Post more than 8 weeks	0.895*** (0.080)	0.533*** (0.038)	0.520*** (0.036)	0.406*** (0.045)	0.619*** (0.078)
User fixed effects	✓	✓	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓	✓	✓
Observations	81965	192408	203587	100039	47323
R squared	0.155	0.136	0.146	0.150	0.161

Standard errors in parantheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: In these variants of Specifications (2), we regress eligible spending (the percentage deviation from the individual-level mean) on a post 8 weeks dummy, which takes value 1 for transactions during or within 8 weeks of account opening, and on a post more than 8 weeks dummy, which takes value 1 for transactions more than 8 weeks post account opening and 0 otherwise. Different columns represent various splits of the average reward amount divided by eligible spending within 8 weeks of account opening per user. The > 0% to < 0.5% category represents 763 users, $\geq 0.5\%$ and < 1% represents 1,678 users, $\geq 1\%$ and < 1.5% represents 1,709 users, $\geq 1.5\%$ and < 2% represents 845 users, and $\geq 2\%$ represents 409 users. User fixed effects and week fixed effects are included. Standard errors are double-clustered at the user and week levels.

Table A8: Estimation results of time on waitlist on user characteristics

	Days on waitlist	Days on waitlist	Days on waitlist
Age	0.193 (0.146)	0.081 (0.145)	0.046 (0.130)
Female	2.113 (3.347)	1.660 (3.333)	3.152 (2.822)
Weekly spending	-0.036 (0.026)	-0.046* (0.027)	-0.047* (0.026)
Weekly ineligible spending	0.047* (0.027)	0.049* (0.028)	0.054** (0.027)
Weekly eligible spending	-0.024 (0.040)	0.009 (0.041)	-0.003 (0.038)
Deciles of transaction- history-length fixed effects		✓	✓
Week-by-year of account opening fixed effects			✓
Mean of Dep. Var.	130.450	130.450	130.450
Observations	5696	5696	5688
Adj. R squared	0.001	0.022	0.288

Robust standard errors in parantheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: In this specification we regress the number of days a user was waitlisted on user characteristics. All variables are measured before account opening. Users only indicate their email address and names upon being waitlisted so none of the characteristics are observable to the company at the time of being waitlisted. As indicated, we control for week-by-year of account opening fixed effects and include fixed effects for each user's decile of transaction history length that we observe before account opening.

Table A9: Estimation results of Safegraph spending on Robinhood clients weekly holdings of that company

	Daily spending in companies' stores relative to total spending Safegraph card spending			Weekly spending in companies' stores relative to total spending Safegraph card spending		
Daily number of holdings in company relative to total holdings Robinhood clients	0.270 (0.258)	0.052*** (0.010)	0.043*** (0.010)			
Weekly number of holdings in company relative to total holdings Robinhood clients				0.299 (0.300)	0.074* (0.041)	0.074* (0.042)
Company fixed effects		✓	✓		✓	✓
Date or week-by-year fixed effects			✓			✓
Observations	19396	19396	19396	3430	3430	3430
R squared	0.019	0.975	0.975	0.022	0.990	0.990

Standard errors in parantheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: In this variant of Specification (5), we aggregate the spending data to the day or week-by-company levels and regress the total daily (weekly) spending in all publicly traded companies of all Safegraph card spending data on the daily (weekly) holdings of that company by Robinhood brokerage clients (the data is obtained from robintrack.net). Date (week-by-year) fixed effects refer to any day (week) of the sample period and company fixed effects for any publicly traded companies. Standard errors are clustered at the date (week) and company levels. The time period and selection of companies (tickers) is the same as in Table 5, however, not all tickers could be matched to the company's spending information in the Safegraph data and we only kept unambiguous matches of the top 200 companies (in terms of the amount spent in their stores) in the Safegraph data. The sample time period is May 2018 to March 2020.

Table A10: Orthogonality test between grant and non-grant receivers before getting off the waitlist

	Non-grant receivers	Grant receivers	Difference
Age (years)	39.48 (8.99)	40.92 (8.77)	-1.45 (0.37)
Number of transactions per user	460.01 (247.99)	486.92 (226.18)	-26.92 (9.67)
Weekly spending	294.52 (248.05)	309.54 (256.21)	-15.03 (10.80)
Eligible weekly spending	40.35 (52.74)	39.64 (49.86)	0.71 (2.12)
Ineligible weekly spending	251.86 (221.03)	267.23 (229.74)	-15.37 (9.68)

Notes: We test for covariate balance using a difference in means t-test by estimating equation, $Y_i = \alpha + \beta \cdot Grant_i + \epsilon_i$, where Y_i takes on different variables as shown in each row of the table, and $Grant_i$ takes on a value of 1 if a user is a grant receiver and takes on 0 if the user did not receive a grant. Columns (1) and (2) present the average values of each dependent variable for non-grant and grant recipients respectively before getting off the waitlist. Column (3) shows the coefficient of the grant indicator, i.e., β . Standard errors in parenthesis.

Table A11: Estimation results of Bumped users' spending ratios on a post account opening dummy interacted with a dummy for users who were sent push notifications about the ride sharing category

	Spending in ride sharing category, percentage deviation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post 8 weeks	0.087*** (0.018)	0.089*** (0.018)	0.089*** (0.018)	0.089*** (0.018)	0.084*** (0.017)	0.083*** (0.017)	0.081*** (0.016)	0.080*** (0.016)
Post 8 weeks times push notification	-0.011 (0.028)	0.003 (0.027)	0.003 (0.027)	-0.003 (0.026)	-0.006 (0.025)	-0.005 (0.024)	0.003 (0.023)	0.004 (0.024)
Post more than 8 weeks	0.066** (0.029)	0.072** (0.028)	0.073*** (0.028)	0.071** (0.028)	0.064** (0.026)	0.061** (0.026)	0.057** (0.024)	0.054** (0.024)
Post more than 8 weeks times push notification	0.027 (0.035)	0.013 (0.030)	0.008 (0.029)	0.008 (0.029)	0.003 (0.028)	0.003 (0.027)	0.001 (0.026)	0.001 (0.024)
User fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Week-by-year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Weeks since introduction of the ride sharing category	- 1 or more	- 2 or more	- 3 or more	- 4 or more	- 5 or more	- 6 or more	- 7 or more	- 8 or more
Observations	75045	78534	79151	79816	80951	82157	83946	86702
R squared	0.265	0.267	0.266	0.270	0.271	0.270	0.268	0.265

Standard errors in parantheses. *** p<0.01, ** p<0.05, * p<0.1

Notes: This table presents the results of estimating a version of Specification (4), in which we regress spending in the ride sharing category (the percentage deviation from the individual-level mean) on a post 8 weeks dummy, which takes value 1 for transactions during or within 8 weeks of account opening, or a post more than 8 weeks dummy, which takes value 1 for transactions more than 8 weeks post account opening and 0 otherwise, and their interaction with a dummy that takes the value of one when a given user was sent a push notification announcing the introduction of the ride sharing category within 8 weeks after his or her account opening week. The ride sharing category was introduced on August 13, 2019. All existing users as of that date received push notifications introducing the ride sharing category. Users who opened their account after this date did not receive those communications. In Columns (1) to (8), we consider users who opened their account 1 to 8 weeks before the introduction of the ride sharing category, respectively, and thus received the communications within 1 to 8 weeks after account opening. User fixed effects and week fixed effects are included. Standard errors are double-clustered at the user and week levels.

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