Which Communities Complain to Policymakers?

Evidence from Consumer Sentinel*

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Abstract

Consumer complaints provide a signal of the problems that different American communities face. I use a large database of millions of complaints to examine how per-capita complaint rates vary across communities, as well as heterogeneity in who complains to different agencies and about different consumer protection issues. I find higher complaint rates in more heavily black, more educated, higher income, older, and more urban communities and lower complaint rates in more heavily Hispanic and higher household size communities. The demographics of complaints are quite different for the CFPB, with much higher rates of complaints from black and college educated areas compared to the FTC or BBBs. I also find much higher rates of finance related complaints from black communities across all reporting agencies.

Keywords: consumer complaint and dispute, customer satisfaction, consumer protection, demographics

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1 Introduction

Consumer complaints channel consumer "voice" (Hirschman (1970)) to policymakers, and so provide a major source of information on emerging problems for policymakers to remedy. In addition, complaints provide evidence of potential wrongdoing that may be required for policymaking by regulatory agencies and the judicial process. Thus, it is no surprise that agencies with consumer protection authority, including the Federal Trade Commission (FTC) and Consumer Financial Protection Bureau (CFPB), spend substantial resources collecting and analyzing consumer complaints.

One major concern of policymakers is understanding the problems that affect different American communities. Consumer complaints are one potential guide. To give one example, Congress recently asked the FTC to develop a comprehensive strategy to reduce fraud in black and Hispanic communities. One of the main items of the FTC's response was to "[l]aunch a pilot program to visit areas with low rates of consumer complaints about fraud" (Federal Trade Commission, 2016) in order to learn about their problems, which may not have been exposed through complaints. Understanding which groups are affected by different types of fraud can also help assist the other prongs of the FTC's response, such as conducting outreach campaigns to local community groups and local media, and developing education programs to help prevent fraud. If, say, minority communities experience different consumer protection issues than other communities, outreach and education programs should be targeted to the problems they face.

Unfortunately, we know very little about how the rates of complaints vary across different

communities in American society. The reason for this is, despite a large empirical literature on complaining behavior, only small samples on complaint behavior have been available for researchers. Researchers have used information from surveys (Singh, 1989), from one local BBB (Oster, 1980; Garrett and Toumanoff, 2010), or from the CFPB (Ayres et al., 2013; Begley and Purnanandam, 2017; Jung et al., 2017), which makes complaints publically available. Given the small samples and limited scope of most of these studies, it is unsurprising that Garrett and Toumanoff (2010) finds that the literature is divided on how demographics such as age, income, education, and race affect the likelihood of consumer complaint.[1] To take two recent studies, Ayres et al. (2013) examines 2011 mortgage CFPB data and finds that areas with more Hispanics, with more seniors, and with more college graduates complain more than other areas, and areas with higher median income complain less than other areas, while Garrett and Toumanoff (2010) finds the opposite for each demographic group using Wisconsin BBB data. These differences may reflect small samples, but they may also reflect heterogeneity across organizations receiving complaints, or the issues that different types of consumers complain about.

In this paper, I provide new evidence on differences in per capita complaint rates across different communities using data from the Consumer Sentinel Network, a data source with orders of magnitude more complaints than used in past literature. The Consumer Sentinel database includes millions of consumer complaints received every year, with complaints on

[1]The literature on this topic is large; see, for example, beyond the papers cited above, Andreasen (1988), Bearden and Teel (1983), Liefeld et al. (1975), Moyer (1984), Andreasen and Best (1977), Hogarth et al. (2001b), and Hogarth et al. (2001a). For papers using CFPB data, Ayres et al. (2013) studies the determinants of 2011 mortgage complaints to the CFPB, Begley and Purnanandam (2017) examine how the Community Reinvestment Act may have affected victimization and so complaints from different communities, and Jung et al. (2017) show that political affiliation of a community has major effects on complaint rates, with higher complaint rates in more liberal communities.

a vast range of topics received by federal and state government agencies, including the FTC and CFPB, as well as private actors such as the Better Business Bureaus (BBBs).[2] This new dataset is both policy relevant, as it is designed for use by law enforcement agencies, and uniquely allows me to look at heterogeneity across the organizations that receive complaints and about the issues that consumers complain about. Doing so can help resolve the contradictions in previous research highlighted above.

Crucially, since most consumers provide their address, I can connect consumer complaints with zip code level demographics. Because the demographic information is at the zip code level, any inferences on demographics are best thought of as reflecting differences between different types of American communities. I compare complaint rates across areas with different racial demographics, looking at the fraction of black, Hispanic, and Asian residents. I also examine several economic and cultural factors, including household income, unemployment rate, household size, urban status, median age, and share of college educated residents.

The data reveal substantial differences in complaint rates between communities with different demographics. I first find that racial demographics affect complaint rates. Holding all other factors fixed, heavily black communities have substantially higher complaint rates than non-black communities, while heavily Hispanic communities have lower complaint rates than non-Hispanic communities. Education also matters; zip codes with a large share of college graduates complain at much higher rates than zip codes with few college graduates. Complaint rates are also lower in areas with large households than areas with small households, and higher in urban and older areas than rural and younger areas. Surprisingly, while the

[2]See https://www.ftc.gov/enforcement/consumer-sentinel-network for more details on the Consumer Sentinel Network. The Consumer Sentinel Network is a secure online database available only to law enforcement. I have been able to receive access as an employee of the FTC.

literature puts a great deal of focus on income, I find an increase in complaint rates from middle class communities compared to poor communities, but not from upper middle class communities compared to middle class communities.

I next demonstrate substantial heterogeneity in the relationship between per capita complaint rates and demographics across both the organizations that contribute to the database, and the consumer protection issues that consumers face. I separately analyze data from the BBBs, CFPB, and the FTC, which are the three largest organizations contributing to the Consumer Sentinel database. I find similar patterns between complaint rates and demographics for complaints to the BBBs, FTC, and the overall Sentinel database. However, complaints to the CFPB have a very different relationship between complaint rates and demographics. In particular, heavily black areas have much higher complaint rates, relative to areas with few blacks, to the CFPB than to the overall database. I also find much higher complaint rates from heavily college educated communities, relative to areas with few college graduates, to the CFPB compared to the Consumer Sentinel database overall. Heavily Hispanic areas complain slightly more to the CFPB than non-Hispanic areas, compared to lower complaint rates from heavily Hispanic areas compared to non-Hispanic areas for the entire Sentinel database.

I also demonstrate significant differences in the types of complaints received from communities with different demographic groups. The Consumer Sentinel divides complaints into two broad groups – "Fraud" and "Other"; the Other category is intended to capture non-fraud related consumer protection violations. Of the six largest categories characterized as Other, four are related to finance. While for several demographic groups, complaint patterns for Fraud and Other topics are similar, I find larger increases in complaint rates with the

share of black residents, share of college educated residents, median household income, and share of urban residents for Other complaints compared to Fraud complaints, and smaller decreases in complaint rates with the share of Hispanic residents. I then examine four finance related categories – concerning Banks and Lenders, Debt Collection, Credit Bureaus, and Credit Cards – and find much higher complaint rates from heavily black areas than non-black areas for all four categories, and higher rates from heavily college educated communities compared to areas with few college educated residents for each of the four except Debt Collection.

Given that the CFPB receives most of the finance related complaints in Consumer Sentinel, differences in complaint rates for finance related issues could be due to differences in the demographics of consumers complaining to the CFPB. To account for this, I examine complaint rates for the BBBs, FTC, and CFPB only on the four finance related categories mentioned above. The demographics of consumers complaining about finance related issues can explain some, but not all, of the higher complaint rates from black communities compared to non-black communities for the CFPB. On the other hand, the higher complaint rates from college educated communities compared to non-college educated communities to the CFPB cannot be explained by the demographics of consumers complaining about finance related issues. Thus, evidence on differences in complaint rates across communities using publically available complaints to the CFPB may not extrapolate to complaints to other agencies, or complaints on non-finance related topics.

Complaint rates are the combination of the victimization rate and the propensity to complain given victimization, so differences in complaint rates may not reflect differences in victimization. In a companion paper, Raval (2019b), I examined how the propensity to

complain *conditional on victimization* varied across demographics by combining company supplied data on victims together with Consumer Sentinel complaints for nine consumer protection enforcement cases. In these cases, all purchasers were considered to be defrauded. Victims living in black and Hispanic communities were much less likely to complain than victims in other communities.

In contrast, this paper examines the demographics of the per-capita complaint rate using *all* complaints to Consumer Sentinel. In order to remove demographic differences in the propensity to complain from the complaint rate, I use a set of weights constructed in Raval (2019b) as the ratio between the predicted victimization rate and complaint rate for each zip code based on demographics. I then construct implied victimization rates as the aggregate per-capita complaint rates on Fraud cases multiplied by these weights. Doing so requires one to extrapolate that the differences between victims and complaints for the nine cases used in Raval (2019b) hold for Fraud-related issues more generally.

The implied victimization rates imply much higher rates of victimization in heavily black areas compared to non-black areas, somewhat higher rates of victimization in urban areas compared to rural areas, and similar rates of victimization for Hispanic and non-Hispanic areas as well as college educated and non-college educated areas. Thus, some of the differences in complaint rates likely reflect the fact that American communities vary in the problems experienced by their consumers.

The paper proceeds as follows. Section 2 examines the process by which a victim of a consumer protection violation complains, and Section 3 describes the data used in this study. Section 4 examines the demographic determinants of complaints to the Consumer Sentinel database, while Section 5 examines heterogeneity by contributing organization and

complaint topic. Section 6 discusses how evidence on aggregate complaint rates informs policymakers on victimization and concludes.

2 Complaint Process

I begin by examining the process by which victims of consumer fraud complain to organizations in Consumer Sentinel. Figure 1 depicts a stylized model of the process by which consumers file complaints in fraud cases. In the flowchart, green diamonds depict decision points, red rectangles start or end nodes, and yellow rectangles processes. The flowchart begins with a company attempting to victimize a consumer.

The first decision point is whether the consumer realizes that they were the (attempted) victim of consumer fraud. Consumers that do not realize that they were victimized do not complain. There are several reasons that a consumer may not be aware that they were victimized. First, consumers may not have checked their bank statements and seen payments to a fraudulent company, or may have seen the payments but not realized that they never received any services from that company.

Second, many consumer frauds involve credence goods (Dulleck and Kerschbamer, 2006), for which the consumer cannot assess the quality of the good. For example, victims of a psychic scam may not know that the psychic is a fraud. Victims of pyramid schemes may blame their own lack of ability for their financial losses, not realizing that the structure of the pyramid meant almost all members would lose money. Finally, for herbal supplements promising weight loss or pain relief, victims are unlikely to know the true medical quality of the supplement, and may ascribe placebo effects or natural changes over time as due to the

supplement.

The flowchart below depicts the process of filing a complaint for the case of a fraudulent company. For a legitimate company, some consumers of that company's services may be unhappy with the product, may feel they were treated unfairly, or may believe that the company violated the consumer protection laws. Not all consumers of the company will have the same experience, even in cases where the company violated consumer protection laws, and so not all consumers will feel victimized.

Consumers realizing they were victimized then gather information on options to obtain redress. In the stylized model of the flowchart, I have modeled consumers as first deciding whether to complain to the company that defrauded them, and then to complain to governmental authorities or the BBBs. Victimization surveys (Anderson, 2007, 2013) find much higher complaint rates to the company involved (or intermediaries such as a retailer) than consumer protection authorities. Consumers that complain to the company and have their problems resolved do not proceed further.

Consumers for whom the company did not resolve their problems, or who did not complain to the company, face the choice of whether to complain to consumer protection authorities. There are several reasons why they may not do so. First, some consumers may not know who to complain to, or how to complain – an information problem. Second, the only explicit cost of complaining is time (Becker, 1965). Some consumers may conclude that the cost of complaining is too high.

Finally, complaining is a pro-social act, as the beneficiaries are often other consumers, and so consumers with less social trust may be less likely to complain. In addition, consumers alienated from mainstream institutions are less likely to choose to interact with

them, including by complaining. In Raval (2019b), I assemble considerable evidence that minority consumers in particular have less social trust – they are much less likely to answer affirmatively to questions on social trust in the General Social Survey, and the qualitative literature in sociology and marketing has also found evidence that members of minority groups experience more alienation from society, and have less trust.

Consumers who decide to complain to the government or BBBs have their complaint entered in the Consumer Sentinel database; I describe this database below.

3 Data

3.1 Consumer Sentinel Network

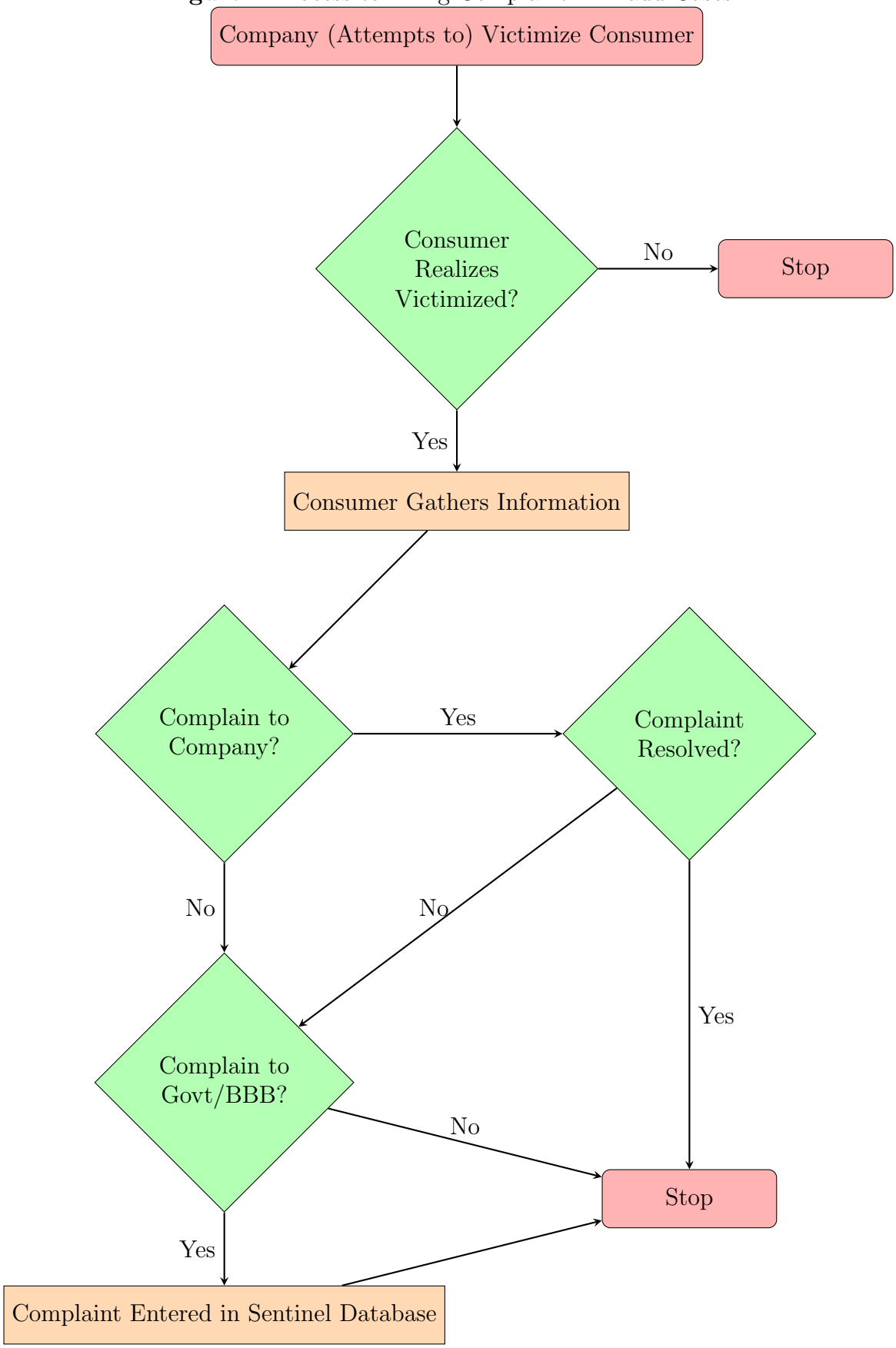
The Consumer Sentinel Network collects data on complaints from several sources – federal government agencies such as the Federal Trade Commission (FTC) and Consumer Financial Protection Bureau (CFPB), private actors such as the Better Business Bureaus (BBBs), and state and local government agencies.[3] Since Consumer Sentinel has a five year data retention policy, I limit the sample to complaints filed from 2014 through 2018.[4]

The main variable that I use to obtain local area demographics is the complaining consumer's zip code. Not all consumers providing complaints either live in a US state or provide a zip code. I exclude complaints without a zip code, as well as zip codes belonging to PO Boxes and Unique Organizations (such as businesses or universities that have their own zip

[3]See https://www.ftc.gov/enforcement/consumer-sentinel-network/reports for the Consumer Sentinel Data Book, which contains further detail on the Consumer Sentinel as well as a wealth of statistics on the complaints included in it. For the BBBs, the complaints provided to Consumer Sentinel are selected by the FTC to be those of national interest; for example, complaints about major national corporations would be more likely to be included than about local housepainters.

[4]I also exclude identity theft and Do Not Call complaints.

Figure 1 Process to Filing Complaint in Fraud Cases



code), zip codes with a 2010 population of less than 100, and zip codes missing the Census demographic variables described in the section below. In addition, to exclude serial complainants, I drop complaints from complainants (identified by full name and zip code) that have six or more complaints in a given year.[5] The resulting dataset has 7.1 million complaints. Of these complaints, 2.5 million or 35.6% are contributed by the FTC, 2.0 million or 27.6% by the BBBs, and 1.0 million or 14.5% by the CFPB. Together, these three organizations provide over three-quarters of the complaints in the dataset.

3.2 Census Demographics

I examine several demographic factors that proxy for cultural and economic factors that could affect complaint rates. Demographics could affect whether a consumer is victimized. In addition, through the complaint process detailed in Section 2, demographics may affect whether a victimized consumer complains to one of the organizations contributing to the Consumer Sentinel.

First, the cost of time may affect whether a consumer complains. Consumers could have a higher cost of time because they have a higher wage rate, so I include median household income as one demographic factor. Retired or unemployed consumers may also have a lower shadow cost of time, so I include the median age and unemployment rate of the zip code. Finally, households with more kids may have a higher shadow cost of time spent at home, so I include median household size.

While the only explicit cost of complaining is time, the consumer still has to be aware

[5]Six complaints per year is the 99.5th percentile of complaints per year across all unique name-zip code combinations.

that they have been defrauded or that a company's conduct was unlawful in some way, and that the BBBs or consumer protection agencies are the appropriate authorities to complain to. Because more educated consumers may be more likely to both understand that they were victimized, and know how to complain, I include the fraction of zip code residents that are college educated. Because of the evidence that minority consumers are more alienated and have less social trust, and so may be less likely to complain, I include demographics for race and ethnicity through the fraction of the zip code that is black, that is Hispanic, and that is Asian.

It is less clear how demographics affect victimization. Some previous research has focused on "disadvantaged" consumers as those of highest risk for victimization; for example, Andreasen (1975) argues that poor, old, uneducated, and minority consumers are more likely to be disadvantaged. Using victimization surveys, Anderson (2007) and Anderson (2013) find varying victimization rates by demographics, with higher victimization rates for minority consumers and the most educated consumers and lower victimization rates for the elderly. How demographics affect victimization likely depends on context; for example, the elderly may be more vulnerable for tech support scams, the unemployed for "work at home" opportunities, etc.

I do not form explicit hypotheses for how demographics affect complaint rates, because demographics can affect the margins of whether a consumer was victimized, and whether a victimized consumer complains, differently. For example, victimization surveys find that the elderly are less likely to be victimized, but elderly consumers who are retired may have a lower cost of time and so be more likely to complain. Minority consumers may be "disadvantaged" and so be more likely to be victimized, but have less social trust and so be less likely to

complain.

I then match the demographic variables listed above from the 2008-2012 American Community Survey (ACS) at the zip code level with complaint data from the Consumer Sentinel database. In total, I use data from 28,604 zip codes.[6]

Table I provides summary statistics for the complaints from all Sentinel contributors, as well as the demographic variables that I include, across the zip codes weighted by their 2010 Census population.[7] The average zip code has 136 complaints per year and 30,000 residents, but the 90th percentile zip code has about 250 more complaints than the 10th percentile and 50,000 more residents. For the average zip code, 12% of residents are black, 16% Hispanic, 5% Asian, 30% college educated, and 81% urban. The median household income of the average zip code is 57,000 dollars, the median age 38, the unemployment rate 6%, and the median household size 2.7. However, as the standard deviation and quantiles reported make clear, there is a lot of heterogeneity in all of these demographics across zip codes: there are heavily white and heavily minority, rich and poor, and urban and rural zip codes.[8]

4 Aggregate Complaints

In this section, I examine how complaint rates vary across communities with different demographics. A simple way to do so is through a plot of how the average complaint rate varies

[6]The Census has created the Zip Code Tabulation Area (ZCTA) in order to connect Census demographics to zip codes from addresses, because the zip code is not a traditional Census geography. The boundaries of zip codes and ZCTAs do not always perfectly line up, but the exclusion of zip codes for PO Boxes and Unique Organizations should help reduce differences between the two.

[7]In Appendix A, I provide further details of the quantiles of the demographic variables that I examine.

[8]I do not include any demographic factors that do not have substantial heterogeneity across zip codes. For example, it would be interesting to examine the percentage of zip code residents that are female, but, given the average of the fraction of female residents across zip codes is 51%, the difference between the 90th and 10th percentiles is less than 6 percentage points.

Table I Summary Statistics

Variable	Mean	SD	10th Percentile	90th Percentile
Complaints Per Year	136	94.9	21	267
2010 Census Population (thousands)	29.5	19.4	5.8	54.9
Percent Black	12.2	18.3	0.4	34.9
Percent Hispanic	16.4	20.5	1.3	46.9
Percent College Educated	28.2	16.3	10.9	52.4
Median Household Income (thousands)	57.2	23	33.4	88.3
Median Age	37.6	6	30.2	44.6
Percent Urban	81	30.5	28	100
Unemployment Rate	6	2.4	3.3	9.2
Median HH Size	2.7	0.4	2.2	3.2
Percent Asian	4.8	8	0.1	12

Note: All statistics estimated after weighting each zipcode by its 2010 population. The number of complaints per year is based on complaints to all sources, averaged across all 5 years of the sample.

with community demographics. In Figure 2, I do this for communities with different concentrations of blacks and Hispanics for complaints in 2015; the black solid and grey dashed lines depict the average complaint rate for communities defined by their share of population that is black and Hispanic, respectively. The estimates are based upon a nonparametric local regression, with the grey area surrounding each graph representing the 95% confidence interval.[9]

While the average complaint rates are not monotonic, Figure 2 demonstrates that the average complaint rate tends to be lower in areas with a greater share of Hispanic residents. After a small rise in complaint rates from areas that are close to 0% Hispanic to areas that are 15% Hispanic, the complaint rate steadily falls as areas become more Hispanic. Communities that are close to 100% Hispanic have about half the complaint rate of areas that are 0% Hispanic. By contrast, the complaint rate rises with the percentage black of the community, although almost all of the increase is before the percentage black is about 10%.

[9]Local regressions fit a different local polynomial regression around each value of the independent variable that weights data points around this value heavily, in order to not impose parametric assumptions on the relationship between variables. See Pagan and Ullah (1999).

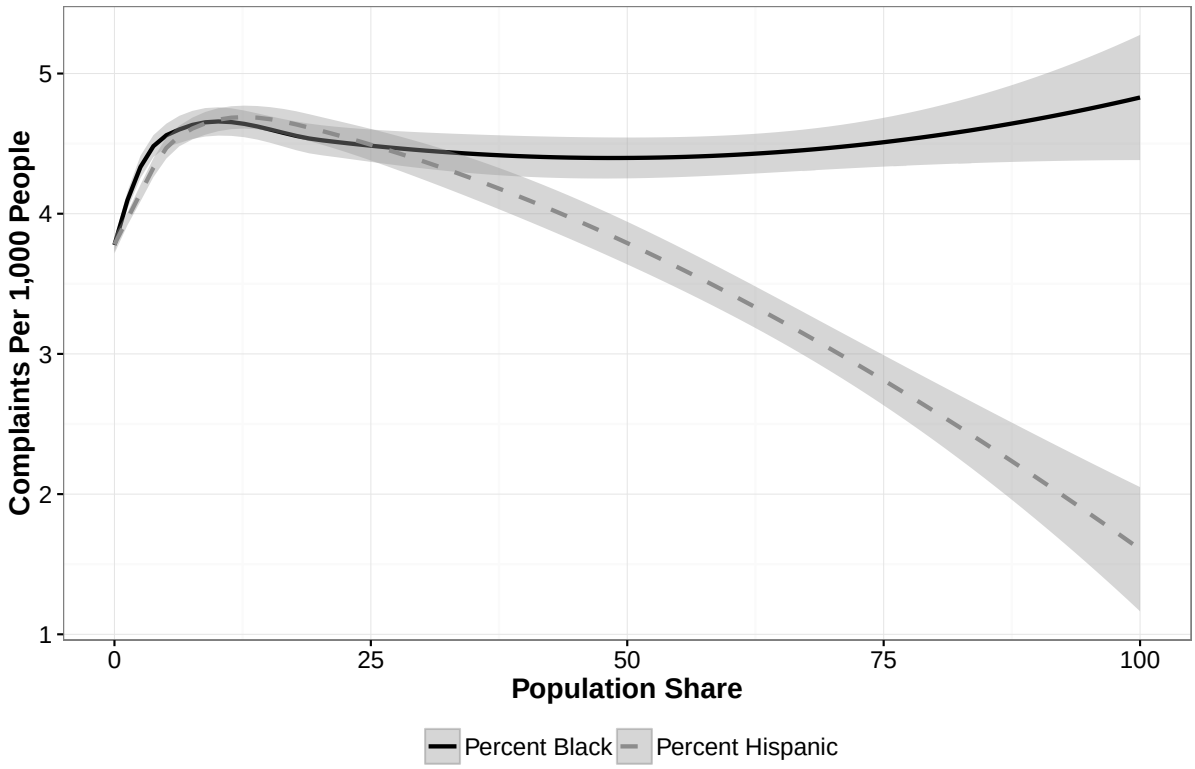


Figure 2 Complaint Rates For Black and Hispanic Communities in 2015

Note: Solid, black line is for percent black and dashed, grey line is for percent Hispanic. Estimates based upon a nonparametric loess regression.

Communities that are 100% black have about a 30% higher complaint rate than communities that are 0% black, but only a 4% higher complaint rate than communities that are 10% black.

While Figure 2 shows that different demographic communities have different complaint rates, these communities differ on several other factors, including median age, median income, education, and urbanization. In order to disentangle the effects of different demographic factors, I estimate the following fractional logit model (Papke and Wooldridge, 1996):

$$E[y_{it}|D_i, \gamma_t] = G(\beta D_i + \gamma_t), \tag{1}$$

where i is the zipcode and t the year. The dependent variable y_{it} is the per-capita complaint

rate. In a fractional logit model, the conditional expectation of the dependent variable is modeled as a logistic function G of linear covariates. I use a fractional logit specification for the complaint rate so that all estimates of the demographic effects β can easily be translated into percent changes compared to the baseline group, holding all other variables fixed.[10] Examining the percent change is important because I examine specifications for complaints from different data contributors or on different issues, which have different base rates of complaining.

I include all the demographic variables mentioned in Section 3.2 in D_{is}. Because, as Figure 2 demonstrates, demographic effects are likely non-linear, I model the effects of these demographic characteristics flexibly through linear B-splines. The variables included are the percentage of black residents, the percentage of Hispanic residents, the percentage of Asian residents, the percentage of urban residents, the local unemployment rate, the percentage of college graduates, the median age, median household income, and median household size. I include year fixed effects through γ_t. In addition, I weight zip codes by their 2010 population, so more populous zip codes receive greater weight.

I first estimate equation (1) for all complaints in the Consumer Sentinel database; I report these estimates in the first column ("All") of Table II. Because I estimate effects for demographic factors using splines, I only report the effect for selected values relative to an omitted category. The baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment

[10] A fractional logit model is used to model a dependent variable that ranges between 0 and 1, which the per-capita complaint rate satisfies.

rate, and 25 for median age.[11] I report the effects for intermediate values of the demographic variables as well in Table A-2.

Table II Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor

	(1) All	(2) FTC	(3) BBB	(4) CFPB
Pct Black = 100%	0.43	0.14	0.63	2.73
	(0.03)	(0.02)	(0.04)	(0.13)
Pct Hispanic = 100%	-0.37	-0.27	-0.45	0.29
	(0.02)	(0.04)	(0.02)	(0.05)
Pct College = 100%	0.55	0.68	0.45	2.54
	(0.04)	(0.06)	(0.06)	(0.19)
Median Income = 130k	0.28	0.18	0.51	0.73
	(0.02)	(0.03)	(0.04)	(0.05)
Median Age = 55	0.50	0.68	0.23	0.83
	(0.02)	(0.04)	(0.02)	(0.05)
Pct Urban = 100%	0.15	0.11	0.26	0.41
	(0.01)	(0.01)	(0.01)	(0.01)
Unemp Rate = 10%	0.06	0.05	0.05	0.09
	(0.01)	(0.01)	(0.01)	(0.02)
Median HH Size = 4	-0.41	-0.47	-0.38	-0.31
	(0.01)	(0.01)	(0.01)	(0.02)
Pct Asian = 25%	-0.02	-0.07	-0.05	0.07
	(0.01)	(0.01)	(0.01)	(0.02)
Observations	143020	143020	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for complaints for All contributors, the second column for FTC complaints, the third column for BBB complaints, and the fourth column for CFPB complaints. Table A-2 reports estimates of the same specifications, but includes the effect of the demographic variables at several additional values.

I first find substantial differences with racial demographics, with higher per-capita complaint rates in heavily black areas compared to non-black areas and lower complaint rates in heavily Hispanic areas compared to non-Hispanic areas. Communities with a 100% black population have a 43% higher complaint rate than those with a 0% black population, hold-

[11] In all of the specifications I run, the number of observations is the number of zip codes times the number of years, and so 143,020. The residual degrees of freedom are always 142,975.

ing all other variables fixed. Communities with a 75% black population have a 33% higher complaint rate, and communities with a 50% black population have a 22% higher complaint rate, compared to areas with a 0% black population. Communities with a higher Hispanic share of the population have lower complaint rates; areas with a 100% Hispanic population have a 37% lower complaint rate compared to areas with 0% Hispanics. Communities with a 75% Hispanic population have a 22% lower complaint rate, and communities with a 50% Hispanic population have a 9% lower complaint rate, compared to areas with a 0% Hispanic population. The standard errors around these estimates are fairly small, so all of these estimates are statistically significantly different from zero.

Areas with a larger share of college graduates complain at much higher rates than areas with few college graduates. Communities with a 100% college educated population have a 55% higher complaint rate than areas with a 0% college educated population; the increase is 36% for communities with a 40% college educated population and 38% for communities with a 60% college population. I find a smaller increase in complaining with household income than I did with college education. I estimate an 28% higher in the complaint rate for with a median income of $130,000 compared to those with a median income of $20,000. However, I find little increase after a household income of $70,000; areas with a median income of $70,000 have a 30% higher complaint rate than those with a median income of $20,000.

Areas with greater household size have lower complaint rates than areas with small households, while areas that are more urban and areas that are older have higher complaint rates than rural and younger areas, respectively. For example, on average, areas with an average household size of 4 have a 41% lower complaint rate than areas with an average household size of 2, and areas with an average household size of 3.5 have a 30% lower

complaint rate. Compared to 0% urban areas, 100% urban areas have 15% higher complaint rates. Older areas also have higher complaint rates; areas with a median age of 55 have a 50% higher complaint rate compared to areas with a median age of 25. This effect is mostly due to the oldest areas; communities with a median age of 45 have a 16% higher complaint rate, and with a median age of 50 a 26% higher complaint rate, compared to areas with a median age of 25.

I find very small effects for the unemployment rate and the percentage of Asian residents. Areas with 10% unemployment have only a 6% higher complaint rate than areas with 0% unemployment. Areas that are 25% Asian have a 2% lower complaint rate than areas that are 0% Asian.

5 Heterogeneity

In this section, I examine how the relationship between complaints and demographics varies across data contributors to the Consumer Sentinel, as well as across the topics that consumers complain about.

5.1 By Organization

In order to examine heterogeneity by organization, I estimate equation (1) for the three largest data contributors – the BBBs, the FTC, and the CFPB – separately. The only change to the specification in equation (1) is that I use the complaint rate for a given data contributor, instead of the aggregate complaint rate. The BBBs and FTC collect complaints on similar consumer protection violations, but the BBBs are private and the FTC a federal

government agency. Thus, any differences between the BBBs and FTC may shed light on whether the demographics of consumers that complain to the government are different than those complaining to a third party NGO. The CFPB specializes in complaints about financial services, so its complaints may have very different demographics than those of the BBBs or FTC which include a broad spectrum of topic areas. These results are included in the last three columns of Table II.

Coefficient estimates for the FTC and BBBs tend to have fairly similar patterns to each other and to those of the overall Consumer Sentinel database. The largest difference is for percentage black; areas with 100% black residents have 63% more complaints from the BBB but only 14% more complaints from the FTC, relative to areas with 0% blacks. In addition, complaint rates fall faster with the fraction Hispanic of the zip code for the BBB, rise faster with median income and percent urban, and rise slower with the fraction college educated and the median age.

The CFPB, however, has very different patterns with respect to demographics. Heavily black and Hispanic areas have much higher rates of CFPB complaints than areas with few black or Hispanic residents. Areas with a 75% (100%) share of blacks have a 159% (273%) higher complaint rate to the CFPB than areas with 0% blacks. Areas with a 100% Hispanic population have a 29% higher complaint rate to the CFPB compared to areas with no Hispanics. For the full sample, BBB, and FTC, heavily Hispanic areas had lower complaint rates than non-Hispanic areas. Areas with more college educated residents also complain at much higher rates to the CFPB than areas with few college educated residents; the increase compared to communities with a 0% college educated population is 135% for communities with a 60% college educated population and 254% for communities with a 100% college

educated population. For the overall Sentinel dataset, college educated areas have higher complaint rates than non-college educated areas, but the magnitude of the difference is much smaller.

Urban, older, and higher income areas also have substantially higher complaint rates to the CFPB relative to rural, younger, and lower income areas. For example, 100% urban areas have a 41% higher complaint rate to the CFPB relative to 0% urban areas, while for all Sentinel complaints 100% urban areas have a 15% higher complaint rate. Areas with a median age above 55 have a 83% higher complaint rate to the CFPB relative to areas with a median age of 25; for all Sentinel complaints, areas with a median age above 55 have only a 50% increase. I also find higher complaint rates in areas with high income compared to areas with low income; communities with a median household income of $130,000 have a 73% higher complaint rate for CFPB complaints relative to areas with a household income of $20,000, compared to 28% for all Sentinel complaints.

These differences between the CFPB and other contributors could be due to the newness of the agency and the attention it has gathered, or to differences between consumers complaining about financial services and consumers with other types of complaints. I examine this question in further detail in the next section.

5.2 By Topic

While the above analysis demonstrated that complaint rates vary considerably across communities with different demographics, the issues that different communities complain about may also differ. I examine this question using the classification of complaints into different cat-

egories in Consumer Sentinel. The Consumer Sentinel database categorizes complaints into 29 categories; complaints are also classified as concerning "Fraud" specifically, or "Other" consumer protection violations. In my dataset, 63% of complaints are classified as Fraud as opposed to Other.

In Table III, I list the top six categories for Fraud and Other complaints separately together with their number of complaints. The top six categories together comprise 65% of Fraud complaints and 80% of Other complaints. Of the top six Other categories, four concern finance: "Banks and Lenders", "Debt Collection", "Credit Bureaus, Information Furnishers and Report Users", and "Credit Cards". In contrast, the top Fraud categories are on several different topics.

Table III Top Six Complaint Categories for Fraud and Other Complaints

Fraud Categories	Complaints	Other Categories	Complaints
Imposter Scams	1,284,152	Banks and Lenders	593,863
Prizes, Sweepstakes and Lotteries	528,800	Debt Collection	447,773
Telephone and Mobile Services	417,275	Auto Related	431,258
Shop-at-Home and Catalog Sales	413,081	Credit Bureaus, Information Furnishers and Report Users	239,213
Internet Services	184,158	Television and Electronic Media	217,715
Foreign Money Offers and Counterfeit Check Scams	112,475	Credit Cards	179,039

I first estimate equation (1) using only complaints characterized as either Fraud or Other; I report these results in the first two columns of Table IV. The only change to the specification in equation (1) is that I use the complaint rate for a given complaint type, instead of the aggregate complaint rate. For both Fraud and Other complaints, I find very similar relationships between the median age, unemployment rate, median household size, and percent Asian and the complaint rate. The biggest difference between Fraud and Other complaints is for the fraction of the zip code that is black; complaint rates on Fraud are 7% higher

in 100% black areas compared to 0% black areas. For Other complaints, complaint rates are 120% higher in 100% black areas. I find smaller declines in complaint rates for heavily Hispanic areas compared to non-Hispanic areas. A 100% Hispanic zip code has, on average, a 47% lower complaint rate for Fraud complaints compared to 0% Hispanic areas, relative to only a 15% lower complaint rate for Other complaints. Average complaint rates rise more for more college educated, richer, and more urban areas for Other complaints compared to Fraud complaints as well.

Table IV Percent Change in Per Capita Complaint Rate by Demographic Factors, by Complaint Category

	(1) Fraud	(2) Other	(3) Banks	(4) DebtCol	(5) CreditBureau	(6) CreditCard
Pct Black = 100%	0.07	1.20	1.91	1.41	5.13	0.97
	(0.02)	(0.06)	(0.10)	(0.09)	(0.34)	(0.09)
Pct Hispanic = 100%	-0.47	-0.15	-0.03	-0.09	0.42	-0.34
	(0.01)	(0.04)	(0.04)	(0.04)	(0.11)	(0.04)
Pct College = 100%	0.45	0.77	1.28	0.28	2.60	3.25
	(0.04)	(0.07)	(0.13)	(0.08)	(0.36)	(0.32)
Median Income = 130k	0.15	0.54	0.87	0.63	0.66	0.34
	(0.02)	(0.04)	(0.07)	(0.06)	(0.09)	(0.05)
Median Age = 55	0.49	0.50	0.78	0.38	0.67	0.68
	(0.03)	(0.03)	(0.05)	(0.05)	(0.10)	(0.08)
Pct Urban = 100%	0.09	0.30	0.35	0.37	0.36	0.45
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)
Unemp Rate = 10%	0.05	0.06	0.12	0.09	0.00	0.05
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Median HH Size = 4	-0.44	-0.37	-0.27	-0.41	-0.34	-0.37
	(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.03)
Pct Asian = 25%	-0.03	-0.00	0.06	-0.07	0.01	0.20
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Observations	143020	143020	143020	143020	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for Fraud complaints, the second column for Other complaints, the third column for complaints on Banks and Lenders ("Banks"), the fourth column for complaints on Debt Collection ("DebtCol"), the fifth column for complaints on Credit Bureaus, Information Furnishers and Report Users ("CreditBureau"), and the sixth column complaints on Credit Cards ("CreditCard"). Table A-3 reports estimates of the same specifications, but includes the effect of the demographic variables at several additional values.

I then estimate complaints from the four finance-related categories mentioned above separately by category using equation (1); these results are contained in the last four columns of Table IV. Strikingly, I find a large increase in complaint rates with the percent black of the zip code for all four categories, and with the percent college educated of the zip code for three of the four categories. Compared to a 0% black zip code, a 100% black zip code has 191% higher complaint rate on banks, 141% higher complaint rate on debt collection, a 513% higher complaint rate on credit bureaus, and a 97% higher complaint rate on credit cards. Similarly, compared to a 0% college educated zip code, a 100% college educated zip code has a 128% higher complaint rate on banks, a 28% higher complaint rate on debt collection, a 260% higher complaint rate on credit bureaus, and a 325% higher complaint rate on credit cards.

The different complaint patterns for Other complaints, and for finance related complaints specifically, could be due to differences in the issues that consumers in different communities complain about, or due to differences in the demographics of complaints received by different organizations. In particular, because CFPB complaints are almost all finance-related, different patterns for the CFPB could be because of complaint differences for finance-related issues.

I examine this question by estimating equation (1) by organization only using complaints on the bank, debt collection, credit bureau, and credit card categories. In my dataset, these four categories have almost 1 million complaints to the CFPB (94% of its overall complaints), 400 thousand complaints to the BBBs (about 19% of its complaints), and 50 thousand complaints to the FTC (about 2% of its complaints).

Table V contains these estimates. I find much higher complaint rates for heavily black

communities, compared to non-black communities, for the FTC and BBB as well as for the CFPB; however, the CFPB continues to have a much stronger relationship between the percentage black of a zip code and the complaint rate. For finance-related complaints, a 100% black zip code has, on average, a 100% higher complaint rate than 0% black zip codes for FTC complaints and 146% higher for BBB complaints, but 276% higher for CFPB complaints. Heavily college educated areas have almost the same complaint rate as areas with no college educated consumers for the FTC and BBB. For the CFPB, a 100% college educated area has a 260% higher complaint rate than a 0% college educated area. These results suggest that some of the percent black differences for the CFPB, but none of the college educated differences, are due to the demographics of consumers complaining about finance-related topics.

6 Discussion and Conclusion

In this study, I have found substantial evidence that consumer complaints vary across communities using a massive dataset of millions of consumer complaints. Communities that are more black, more college educated, older, and higher income have higher complaint rates than other areas, while more Hispanic, more rural, and areas with greater household size have lower complaint rates than other areas. In addition, I have shown substantial heterogeneity in how complaint rates vary across demographic groups across organizations that receive complaints, and across consumer protection issues that consumers face. In particular, complaints to the CFPB have very different patterns than those to the BBBs or the FTC, with the CFPB receiving much higher rates of complaints from heavily black and heavily

Table V Percent Change in Per Capita Complaint Rate by Demographic Factors by Data Contributor: Finance-Related Complaints

	(1) All	(2) FTC	(3) BBB	(4) CFPB
Pct Black = 100%	1.99	1.00	1.46	2.76
	(0.09)	(0.13)	(0.09)	(0.14)
Pct Hispanic = 100%	-0.04	0.07	-0.40	0.28
	(0.03)	(0.17)	(0.03)	(0.05)
Pct College = 100%	1.31	-0.07	0.02	2.60
	(0.11)	(0.12)	(0.07)	(0.19)
Median Income = 130k	0.70	0.30	0.77	0.75
	(0.05)	(0.11)	(0.07)	(0.06)
Median Age = 55	0.62	0.32	0.20	0.85
	(0.04)	(0.10)	(0.05)	(0.05)
Pct Urban = 100%	0.37	0.20	0.38	0.41
	(0.01)	(0.03)	(0.02)	(0.01)
Unemp Rate = 10%	0.08	0.04	0.04	0.10
	(0.02)	(0.04)	(0.02)	(0.02)
Median HH Size = 4	-0.34	-0.53	-0.40	-0.30
	(0.02)	(0.04)	(0.02)	(0.02)
Pct Asian = 25%	0.03	-0.10	-0.11	0.06
	(0.01)	(0.03)	(0.02)	(0.02)
Observations	143020	143020	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for complaints from All contributors, the second column for FTC complaints, the third column for BBB complaints, and the fourth column for CFPB complaints. Estimates only use complaints from the "Banks and Lenders", "Debt Collection", "Credit Bureaus, Information Furnishers and Report Users", and "Credit Cards" categories. Table A-4 reports estimates of the same specifications, but includes the effect of the demographic variables at several additional values.

college educated areas than other areas. I also find heavily black areas have much greater complaint rates on finance related issues than other areas, which can explain some, but not all, of the differences for the CFPB.

This evidence on how complaints vary across communities could help improve the activities of policymakers in several ways. By understanding the unique needs of different communities, policymakers could provide a more targeted outreach to reflect the issues that different communities face. The FTC and other regulatory agencies regularly hold meetings and events across the country about consumer protection issues. Given limited resources, targeting outreach events and information campaigns to the communities most heavily affected by different problems may improve the effectiveness of these approaches. Policymakers may want to focus on encouraging complaining for consumers in communities that are less likely to voice their problems. For consumers in communities that already voice their problems, policymakers might instead focus on providing information to help consumers recognize and avoid fraud.

One major limitation of the analysis so far is that it remains unclear how complaints relate to the underlying problems that consumers face. Figure 1 depicted the process by which consumers complain to Consumer Sentinel. Given this process, complaints are likely to be useful signals of problems for policymakers for certain types of issues. Credence goods are likely to have less complaints relative to their degree of victimization compared to experience goods, for which victims are more likely to eventually realize that they are victimized. Complaints are more likely when the consumer loses more money, as the potential benefits of complaining outweigh any cost, and when the company fails to respond to consumer complaints that it receives. Finally, complaints will be higher for consumers that are better

informed, and will be lower for consumers that are more alienated and lack trust in the institutions of society.

As Figure 1 showed, differences in the number of complaints per victim could be due to differences in the consumer's recognition of victimization, in the company's response to complaints directed to them, or in the decision to complain to consumer protection authorities for consumers who realize they were victimized. In order to examine how demographics might affect victimization, I construct an implied victimization rate by multiplying the complaint rates in Consumer Sentinel by a set of weights developed in Raval (2019b) as the predicted victim rate divided by the predicted complaint rate.[12] Because Raval (2019b) used data from only nine consumer protection cases, for external validity, this exercise requires that estimates of the propensity to complain for these cases extend to a broader set of complaints. I thus examine Fraud complaints, as the cases detailed above are fraud cases in which all consumers were considered defrauded and so may be different than the finance-related issues that dominate complaints categorized as Other.[13]

In Table VI, I report estimates of equation (1) using both the complaint rate for Fraud complaints, and the implied victimization rate based on the same Fraud complaints after multiplying by the weights as above. The effects of the racial and ethnic demographic

[12]Formally, the estimated weight w_i for zip code i with demographics D_i is the predicted victim rate for zip code i based on demographics $\hat{r}_i^V(D_i)$ divided by the predicted complaint rate based on demographics $\hat{r}_i^C(D_i)$:

$$w_i = \frac{\hat{r}_i^V(D_i)}{\hat{r}_i^C(D_i)}. \tag{2}$$

Thus, multiplying per-capita complaint rates by these weights would adjust for differences in the propensity to complain across different demographic groups.

[13]The cases I used range in topic area across different types of fraud, including fraud related to payday loan applications, computer security (spyware), dietary supplements, business opportunity/coaching scams, and the money transfer component of an imposter scam.

variables have the largest shift when moving from analyzing the complaint rate to the implied victimization rate. For Fraud complaints, a 100% black community has, on average, a 7% higher complaint rate than a 0% black community, but a 161% higher implied victimization rate. A 100% Hispanic community has, on average, a 47% lower complaint rate than a 0% Hispanic community, but a 6% higher implied victimization rate. I also find substantial differences between the complaint rate and implied victimization rate for the percentage of the community that is college educated and that is urban. A 100% college educated zip code has a 45% higher complaint rate than a 0% college educated zip code, compared to a 3% lower implied victimization rate. A completely urban area has a 9% higher complaint rate, but 53% higher implied victimization rate, than a completely rural area.

While these results have to be taken with a grain of salt given the extrapolation involved, they suggest that victimization rates are not that different in heavily Hispanic and non-Hispanic areas, and in heavily college educated and non college educated areas. On the other hand, heavily black areas have much higher implied victimization rates than complaint rates, as do urban areas.

One main conclusion of this paper is that complaint rates are higher in heavily black communities than non-black communities. Because victims from heavily black communities are also less likely to complain than those from other communities, differences in victimization for heavily black communities are likely to be even larger than differences in complaint rates. Policymakers should aim to learn more why black communities experience higher rates of complaints, especially on finance related issues. Higher rates of complaints could reflect a lack of awareness on the part of consumers that could be alleviated by consumer education such as financial literacy classes, or lower levels of local resources devoted to consumer protection.

Table VI Percent Change in Per Capita Complaint Rate and Implied Victimization Rate by Demographic Factors for Fraud Complaints

	(1) Complaint Rate	(2) Implied Victimization Rate
Pct Black = 100%	0.07	1.61
	(0.02)	(0.04)
Pct Hispanic = 100%	-0.47	0.06
	(0.01)	(0.02)
Pct College = 100%	0.45	-0.03
	(0.04)	(0.03)
Median Income = 130k	0.15	-0.08
	(0.02)	(0.02)
Median Age = 55	0.49	0.42
	(0.03)	(0.02)
Pct Urban = 100%	0.09	0.53
	(0.01)	(0.01)
Unemp Rate = 10%	0.05	0.07
	(0.01)	(0.01)
Median HH Size = 4	-0.44	-0.35
	(0.01)	(0.01)
Pct Asian = 25%	-0.03	-0.12
	(0.01)	(0.01)
Observations	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses the complaint rate, and the second column the complaint rate multiplied by weights from Raval (2019b) in order to construct an implied victimization rate. Table A-5 reports estimates of the same specifications, but includes the effect of the demographic variables at several additional values.

On the other hand, these high rates of complaints, especially on finance related issues, could be because lower quality businesses serve these communities.

In addition, information from complaints are likely to be useful for policymakers for only certain types of problems. For example, consumers of credence goods may not complain as they do not realize that they are victimized, so consumer complaints may be more reliable signals of problems for experience goods. For issues for which complaining is rare, one potential solution is to examine the demographics of victims of particular violations directly, as in Raval (2019a), using information on victims from law enforcement actions. Another strategy is to survey victims in order to understand their demographics, their motivations for complaining or not complaining, and potential interventions to reduce their susceptibility to fraud.

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A Demographics

Table A-1 contains the 1st, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 99th percentile quantiles of each variable across zip codes. The quantiles are estimated after weighting each zip code by its 2010 population. All of the ethnic demographics are heavily skewed – half of the American population lives in zip codes whose population is less than 5 percent black, less than 8 percent Hispanic, and less than 2 percent Asian. On the other hand, majority black and majority Hispanic zip codes each comprise more than 5 percent of population weighted zip codes. The measure of urbanization is similarly skewed. More than 5% of zip codes are completely rural, while more than 25% of zip codes ae completely urban.[14]

The other variables are somewhat less skewed. The median age for the median zip code is 37.5, with the bottom 5 percent of zip codes with a median age below 28 and the top 5 percent of zip codes with a median age above 47. The median household size is 2.6 for the median zip code, compared to below 2.1 for the bottom 5 percent of zip codes and above 3.5 for the top 5 percent of zip codes. The unemployment rate for the median zip code is 5.6 percent; the bottom 5 percent of zip codes have an unemployment rate below 2.7 percent while the top 5 percent of zip codes have an unemployment rate above 10.5 percent. For the median zip code, the median household income is 52 thousand dollars; the bottom 5 percent have a median income below 29 thousand dollars and the top 5 percent have a median income above 100 thousand dollars. Lastly, in the median zip code about 24 percent of the 25 year old and above population have completed college, compared to less than 8.6 percent for the bottom 5 percent of zip codes and above 61.2 percent for the top 5 percent of zip codes.

Table A-1 Quantiles of Demographic Variables

Variable	1%	5%	10%	25%	50%	75%	90%	95%	99%
Complaints Per Year	2	10	21	61	124	193	267	313	403
2010 Census Population (thousands)	1	3	5.8	14.7	27.4	40.5	54.9	64.6	89.8
Percent Black	0	0.1	0.4	1.4	4.7	14.5	34.9	54.6	87.6
Percent Hispanic	0	0.7	1.3	3	7.7	20.8	46.9	65.3	90.8
Percent College Educated	5.1	8.6	10.9	15.8	24.1	37.4	52.4	61.2	75.5
Median Household Income (thousands)	22.5	29.4	33.4	41.2	52	68.5	88.3	101.3	130.3
Median Age	23.5	28.3	30.2	33.7	37.5	41.2	44.6	47.1	54.8
Percent Urban	0	0	28	74.3	98	100	100	100	100
Unemployment Rate	1.5	2.7	3.3	4.3	5.6	7.3	9.2	10.5	13.3
Median HH Size	1.8	2.1	2.2	2.4	2.6	2.9	3.2	3.5	4.1
Percent Asian	0	0	0.1	0.6	2	5.2	12	19.1	43.7

Note: The 1st, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 99th percentile quantiles of each variable across zip codes are included in the table, where the quantiles are estimated after weighting each zipcode by its 2010 population.

B Additional Tables

[14]Because I exclude PO Boxes, I likely miss some of the population living in rural areas, who are more likely to use PO Boxes.

Table A-2 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor: Additional Values

	(1) All	(2) FTC	(3) BBB	(4) CFPB
Pct Black = 5%	0.08	0.06	0.15	0.23
	(0.00)	(0.01)	(0.01)	(0.01)
Pct Black = 25%	0.19	0.06	0.30	0.66
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Black = 50%	0.22	0.02	0.31	1.05
	(0.01)	(0.01)	(0.01)	(0.03)
Pct Black = 75%	0.33	0.05	0.49	1.59
	(0.01)	(0.01)	(0.02)	(0.05)
Pct Black = 100%	0.43	0.14	0.63	2.73
	(0.03)	(0.02)	(0.04)	(0.13)
Pct Hispanic = 5%	0.05	0.12	0.03	0.25
	(0.00)	(0.01)	(0.01)	(0.01)
Pct Hispanic = 25%	0.04	0.14	0.02	0.46
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Hispanic = 50%	-0.09	0.04	-0.17	0.36
	(0.01)	(0.01)	(0.01)	(0.02)
Pct Hispanic = 75%	-0.22	-0.14	-0.28	0.27
	(0.01)	(0.01)	(0.01)	(0.03)
Pct Hispanic = 100%	-0.37	-0.27	-0.45	0.29
	(0.02)	(0.04)	(0.02)	(0.05)
Pct College = 10%	0.20	0.15	0.32	0.49
	(0.02)	(0.03)	(0.03)	(0.05)
Pct College = 20%	0.31	0.23	0.48	0.88
	(0.02)	(0.03)	(0.04)	(0.07)
Pct College = 40%	0.36	0.31	0.52	1.20
	(0.02)	(0.03)	(0.04)	(0.08)
Pct College = 60%	0.38	0.33	0.49	1.35
	(0.02)	(0.03)	(0.04)	(0.09)
Pct College = 100%	0.55	0.68	0.45	2.54
	(0.04)	(0.06)	(0.06)	(0.19)
Median Income = 30k	0.00	0.01	-0.03	-0.04
	(0.01)	(0.02)	(0.02)	(0.02)
Median Income = 40k	0.13	0.07	0.16	0.22
	(0.01)	(0.02)	(0.02)	(0.02)
Median Income = 70k	0.30	0.17	0.47	0.63
	(0.01)	(0.02)	(0.02)	(0.03)
Median Income = 100k	0.26	0.15	0.46	0.62
	(0.02)	(0.02)	(0.02)	(0.04)
Median Income = 130k	0.28	0.18	0.51	0.73
	(0.02)	(0.03)	(0.04)	(0.05)
Median Age = 30	0.13	0.03	0.24	0.11
	(0.01)	(0.01)	(0.01)	(0.02)
Median Age = 40	0.13	0.09	0.11	0.17
	(0.01)	(0.01)	(0.01)	(0.02)
Median Age = 45	0.16	0.15	0.09	0.30
	(0.01)	(0.02)	(0.01)	(0.02)
Median Age = 50	0.26	0.32	0.13	0.39
	(0.01)	(0.02)	(0.02)	(0.03)
Median Age = 55	0.50	0.68	0.23	0.83

Table A-2 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor: Additional Values

	(1) All	(2) FTC	(3) BBB	(4) CFPB
	(0.02)	(0.04)	(0.02)	(0.05)
Pct Urban = 25%	0.08	0.10	0.07	0.18
	(0.01)	(0.01)	(0.01)	(0.02)
Pct Urban = 50%	0.03	0.02	0.06	0.12
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Urban = 75%	0.05	0.05	0.09	0.14
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Urban = 100%	0.15	0.11	0.26	0.41
	(0.01)	(0.01)	(0.01)	(0.01)
Unemp Rate = 3%	-0.11	-0.10	-0.06	-0.21
	(0.01)	(0.01)	(0.01)	(0.01)
Unemp Rate = 5%	-0.04	-0.04	-0.02	-0.11
	(0.01)	(0.01)	(0.01)	(0.01)
Unemp Rate = 7.5%	0.00	-0.01	0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Unemp Rate = 10%	0.06	0.05	0.05	0.09
	(0.01)	(0.01)	(0.01)	(0.02)
Median HH Size = 2.5	-0.19	-0.19	-0.19	-0.25
	(0.00)	(0.01)	(0.01)	(0.01)
Median HH Size = 3	-0.23	-0.24	-0.19	-0.16
	(0.01)	(0.01)	(0.01)	(0.01)
Median HH Size = 3.5	-0.30	-0.33	-0.26	-0.22
	(0.01)	(0.01)	(0.01)	(0.01)
Median HH Size = 4	-0.41	-0.47	-0.38	-0.31
	(0.01)	(0.01)	(0.01)	(0.02)
Pct Asian = 5%	0.05	0.06	0.03	0.09
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Asian = 10%	0.01	0.00	-0.03	0.04
	(0.01)	(0.01)	(0.01)	(0.01)
Pct Asian = 25%	-0.02	-0.07	-0.05	0.07
	(0.01)	(0.01)	(0.01)	(0.02)
Year=2015	-0.01	0.19	0.03	0.05
	(0.00)	(0.00)	(0.00)	(0.01)
Year=2016	0.04	0.30	0.06	0.04
	(0.00)	(0.01)	(0.00)	(0.01)
Year=2017	-0.01	0.31	0.02	0.16
	(0.00)	(0.01)	(0.00)	(0.01)
Year=2018	0.11	0.54	0.19	0.19
	(0.00)	(0.01)	(0.01)	(0.01)
Observations	143020	143020	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for complaints from All contributors, the second column for FTC complaints, the third column for BBB complaints, and the fourth column for CFPB complaints.

Table A-3 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Complaint Category: Additional Values

	(1) Fraud	(2) Other	(3) Banks	(4) DebtCol	(5) CreditBureau	(6) CreditCard
Pct Black = 5%	0.05	0.15	0.16	0.22	0.36	0.07
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Pct Black = 25%	0.08	0.40	0.49	0.54	1.15	0.28
	(0.00)	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)
Pct Black = 50%	0.05	0.56	0.77	0.71	1.92	0.43
	(0.01)	(0.02)	(0.02)	(0.03)	(0.08)	(0.03)
Pct Black = 75%	0.09	0.80	1.17	0.99	2.68	0.73
	(0.01)	(0.03)	(0.04)	(0.05)	(0.13)	(0.04)
Pct Black = 100%	0.07	1.20	1.91	1.41	5.13	0.97
	(0.02)	(0.06)	(0.10)	(0.09)	(0.34)	(0.09)
Pct Hispanic = 5%	0.03	0.10	0.17	0.10	0.31	0.13
	(0.00)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)
Pct Hispanic = 25%	0.00	0.13	0.19	0.17	0.65	0.24
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.02)
Pct Hispanic = 50%	-0.12	-0.02	0.05	0.02	0.54	0.10
	(0.01)	(0.01)	(0.02)	(0.02)	(0.05)	(0.03)
Pct Hispanic = 75%	-0.26	-0.13	-0.01	-0.15	0.51	-0.04
	(0.01)	(0.01)	(0.02)	(0.02)	(0.07)	(0.03)
Pct Hispanic = 100%	-0.47	-0.15	-0.03	-0.09	0.42	-0.34
	(0.01)	(0.04)	(0.04)	(0.04)	(0.11)	(0.04)
Pct College = 10%	0.16	0.29	0.42	0.29	0.32	0.40
	(0.02)	(0.03)	(0.05)	(0.06)	(0.10)	(0.08)
Pct College = 20%	0.22	0.49	0.71	0.45	0.63	0.76
	(0.02)	(0.03)	(0.06)	(0.06)	(0.12)	(0.10)
Pct College = 40%	0.26	0.57	0.82	0.47	1.10	1.13
	(0.02)	(0.04)	(0.07)	(0.06)	(0.16)	(0.12)
Pct College = 60%	0.28	0.60	0.81	0.45	1.40	1.42
	(0.02)	(0.04)	(0.07)	(0.06)	(0.19)	(0.14)
Pct College = 100%	0.45	0.77	1.28	0.28	2.60	3.25
	(0.04)	(0.07)	(0.13)	(0.08)	(0.36)	(0.32)
Median Income = 30k	-0.00	0.00	-0.08	0.09	0.12	-0.04
	(0.01)	(0.02)	(0.02)	(0.03)	(0.05)	(0.03)
Median Income = 40k	0.06	0.22	0.20	0.36	0.46	0.06
	(0.01)	(0.02)	(0.02)	(0.03)	(0.05)	(0.03)
Median Income = 70k	0.16	0.53	0.69	0.72	0.85	0.26
	(0.01)	(0.02)	(0.04)	(0.04)	(0.07)	(0.04)
Median Income = 100k	0.14	0.48	0.76	0.55	0.66	0.28
	(0.01)	(0.03)	(0.05)	(0.04)	(0.06)	(0.04)
Median Income = 130k	0.15	0.54	0.87	0.63	0.66	0.34
	(0.02)	(0.04)	(0.07)	(0.06)	(0.09)	(0.05)

Table A-3 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Complaint Category: Additional Values

	(1) Fraud	(2) Other	(3) Banks	(4) DebtCol	(5) CreditBureau	(6) CreditCard
Median Age = 30	0.10	0.18	0.12	0.32	0.19	0.16
	(0.01)	(0.01)	(0.02)	(0.03)	(0.04)	(0.03)
Median Age = 40	0.12	0.14	0.21	0.15	0.11	0.22
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Median Age = 45	0.16	0.16	0.27	0.15	0.17	0.30
	(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.03)
Median Age = 50	0.25	0.25	0.36	0.23	0.30	0.30
	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)	(0.04)
Median Age = 55	0.49	0.50	0.78	0.38	0.67	0.68
	(0.03)	(0.03)	(0.05)	(0.05)	(0.10)	(0.08)
Pct Urban = 25%	0.07	0.12	0.14	0.12	0.21	0.10
	(0.01)	(0.01)	(0.02)	(0.02)	(0.05)	(0.03)
Pct Urban = 50%	0.01	0.08	0.10	0.09	0.18	0.14
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Pct Urban = 75%	0.04	0.11	0.12	0.15	0.16	0.16
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Pct Urban = 100%	0.09	0.30	0.35	0.37	0.36	0.45
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)
Unemp Rate = 3%	-0.07	-0.18	-0.25	-0.10	-0.20	-0.20
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Unemp Rate = 5%	-0.02	-0.10	-0.12	-0.02	-0.17	-0.12
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Unemp Rate = 7.5%	0.01	-0.01	0.01	0.05	-0.07	-0.04
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Unemp Rate = 10%	0.05	0.06	0.12	0.09	0.00	0.05
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Median HH Size = 2.5	-0.19	-0.20	-0.22	-0.20	-0.21	-0.27
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Median HH Size = 3	-0.25	-0.19	-0.15	-0.20	-0.09	-0.26
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Median HH Size = 3.5	-0.34	-0.24	-0.20	-0.26	-0.19	-0.31
	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)
Median HH Size = 4	-0.44	-0.37	-0.27	-0.41	-0.34	-0.37
	(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.03)
Pct Asian = 5%	0.04	0.07	0.12	0.06	0.00	0.07
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Pct Asian = 10%	0.01	0.01	0.06	0.02	-0.03	0.09
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Pct Asian = 25%	-0.03	-0.00	0.06	-0.07	0.01	0.20
	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Year=2015	-0.04	0.06	0.00	-0.02	0.11	0.22
	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)
Year=2016	0.02	0.07	0.02	-0.11	0.03	0.34
	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)
Year=2017	-0.03	0.04	-0.08	-0.22	0.94	0.35
	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	(0.01)
Year=2018	0.08	0.14	-0.06	-0.21	1.20	0.44
	(0.00)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)
Observations	143020	143020	143020	143020	143020	143020

Table A-3 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Complaint Category: Additional Values

	(1) Fraud	(2) Other	(3) Banks	(4) DebtCol	(5) CreditBureau	(6) CreditCard

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for Fraud complaints, the second column for Other complaints, the third column for complaints on Banks and Lenders ("Banks"), the fourth column for complaints on Debt Collection ("DebtCol"), the fifth column for complaints on Credit Bureaus, Information Furnishers and Report Users ("CreditBureau"), and the sixth column complaints on Credit Cards ("CreditCard").

Table A-4 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor, For Finance Related Complaints: Additional Values

	(1) All	(2) FTC	(3) BBB	(4) CFPB
Pct Black = 5%	0.19	0.16	0.24	0.22
	(0.01)	(0.02)	(0.01)	(0.01)
Pct Black = 25%	0.57	0.37	0.63	0.65
	(0.01)	(0.03)	(0.02)	(0.01)
Pct Black = 50%	0.85	0.43	0.75	1.05
	(0.02)	(0.04)	(0.03)	(0.03)
Pct Black = 75%	1.24	0.66	1.11	1.58
	(0.04)	(0.07)	(0.05)	(0.05)
Pct Black = 100%	1.99	1.00	1.46	2.76
	(0.09)	(0.13)	(0.09)	(0.14)
Pct Hispanic = 5%	0.16	0.10	0.01	0.25
	(0.01)	(0.02)	(0.01)	(0.01)
Pct Hispanic = 25%	0.25	0.14	0.05	0.47
	(0.01)	(0.03)	(0.01)	(0.01)
Pct Hispanic = 50%	0.11	0.14	-0.16	0.36
	(0.01)	(0.04)	(0.02)	(0.02)
Pct Hispanic = 75%	0.01	-0.11	-0.27	0.27
	(0.02)	(0.06)	(0.02)	(0.03)
Pct Hispanic = 100%	-0.04	0.07	-0.40	0.28
	(0.03)	(0.17)	(0.03)	(0.05)
Pct College = 10%	0.35	0.22	0.22	0.51
	(0.04)	(0.10)	(0.05)	(0.06)
Pct College = 20%	0.62	0.24	0.30	0.91
	(0.05)	(0.09)	(0.05)	(0.07)
Pct College = 40%	0.77	0.09	0.26	1.24
	(0.05)	(0.09)	(0.05)	(0.08)
Pct College = 60%	0.83	-0.03	0.18	1.37
	(0.06)	(0.08)	(0.05)	(0.09)
Pct College = 100%	1.31	-0.07	0.02	2.60
	(0.11)	(0.12)	(0.07)	(0.19)
Median Income = 30k	0.01	0.09	0.09	-0.03

Table A-4 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor, For Finance Related Complaints: Additional Values

	(1) All	(2) FTC	(3) BBB	(4) CFPB
	(0.02)	(0.06)	(0.03)	(0.02)
Median Income = 40k	0.27	0.26	0.34	0.24
	(0.02)	(0.07)	(0.03)	(0.02)
Median Income = 70k	0.66	0.47	0.74	0.66
	(0.03)	(0.08)	(0.04)	(0.04)
Median Income = 100k	0.61	0.40	0.69	0.64
	(0.03)	(0.08)	(0.05)	(0.04)
Median Income = 130k	0.70	0.30	0.77	0.75
	(0.05)	(0.11)	(0.07)	(0.06)
Median Age = 30	0.19	0.15	0.29	0.11
	(0.02)	(0.04)	(0.02)	(0.02)
Median Age = 40	0.18	0.08	0.09	0.18
	(0.02)	(0.04)	(0.02)	(0.02)
Median Age = 45	0.22	0.07	0.08	0.30
	(0.02)	(0.04)	(0.02)	(0.02)
Median Age = 50	0.30	0.20	0.10	0.40
	(0.02)	(0.06)	(0.03)	(0.03)
Median Age = 55	0.62	0.32	0.20	0.85
	(0.04)	(0.10)	(0.05)	(0.05)
Pct Urban = 25%	0.14	0.06	0.11	0.18
	(0.02)	(0.05)	(0.02)	(0.02)
Pct Urban = 50%	0.11	0.05	0.11	0.12
	(0.01)	(0.03)	(0.02)	(0.01)
Pct Urban = 75%	0.14	0.07	0.16	0.15
	(0.01)	(0.03)	(0.02)	(0.01)
Pct Urban = 100%	0.37	0.20	0.38	0.41
	(0.01)	(0.03)	(0.02)	(0.01)
Unemp Rate = 3%	-0.19	-0.13	-0.06	-0.21
	(0.01)	(0.03)	(0.02)	(0.01)
Unemp Rate = 5%	-0.10	-0.08	-0.01	-0.11
	(0.01)	(0.03)	(0.02)	(0.01)
Unemp Rate = 7.5%	0.00	-0.04	0.03	-0.01
	(0.01)	(0.03)	(0.02)	(0.02)
Unemp Rate = 10%	0.08	0.04	0.04	0.10
	(0.02)	(0.04)	(0.02)	(0.02)
Median HH Size = 2.5	-0.22	-0.20	-0.16	-0.25
	(0.01)	(0.02)	(0.01)	(0.01)
Median HH Size = 3	-0.17	-0.28	-0.15	-0.16
	(0.01)	(0.02)	(0.01)	(0.01)
Median HH Size = 3.5	-0.23	-0.34	-0.22	-0.22
	(0.01)	(0.03)	(0.02)	(0.02)
Median HH Size = 4	-0.34	-0.53	-0.40	-0.30
	(0.02)	(0.04)	(0.02)	(0.02)
Pct Asian = 5%	0.08	0.01	0.02	0.09
	(0.01)	(0.02)	(0.01)	(0.01)
Pct Asian = 10%	0.04	-0.01	-0.03	0.04
	(0.01)	(0.02)	(0.01)	(0.01)
Pct Asian = 25%	0.03	-0.10	-0.11	0.06

Table A-4 Percent Change in Per Capita Complaint Rate by Demographic Factors, by Data Contributor, For Finance Related Complaints: Additional Values

	(1) All	(2) FTC	(3) BBB	(4) CFPB
	(0.01)	(0.03)	(0.02)	(0.02)
Year=2015	0.03	0.26	0.02	0.03
	(0.01)	(0.02)	(0.01)	(0.01)
Year=2016	0.00	0.05	-0.01	0.02
	(0.01)	(0.02)	(0.01)	(0.01)
Year=2017	0.03	0.06	-0.15	0.14
	(0.01)	(0.02)	(0.01)	(0.01)
Year=2018	0.08	-0.02	-0.16	0.16
	(0.01)	(0.02)	(0.01)	(0.01)
Observations	143020	143020	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses estimates for complaints from All contributors, the second column for FTC complaints, the third column for BBB complaints, and the fourth column for CFPB complaints. Estimates only use complaints from the "Banks and Lenders", "Debt Collection", "Credit Bureaus, Information Furnishers and Report Users", and "Credit Cards" categories.

Table A-5 Percent Change in Per Capita Complaint Rate and Implied Victimization Rate by Demographic Factors for Fraud Complaints: Additional Values

	(1) Complaint Rate	(2) Implied Victimization Rate
Pct Black = 5%	0.05	0.10
	(0.00)	(0.00)
Pct Black = 25%	0.08	0.38
	(0.00)	(0.01)
Pct Black = 50%	0.05	0.71
	(0.01)	(0.01)
Pct Black = 75%	0.09	1.23
	(0.01)	(0.02)
Pct Black = 100%	0.07	1.61
	(0.02)	(0.04)
Pct Hispanic = 5%	0.03	0.05
	(0.00)	(0.01)
Pct Hispanic = 25%	0.00	0.14
	(0.01)	(0.01)
Pct Hispanic = 50%	-0.12	0.18
	(0.01)	(0.01)
Pct Hispanic = 75%	-0.26	0.20
	(0.01)	(0.01)
Pct Hispanic = 100%	-0.47	0.06
	(0.01)	(0.02)

Table A-5 Percent Change in Per Capita Complaint Rate and Implied Victimization Rate by Demographic Factors for Fraud Complaints: Additional Values

	(1) Complaint Rate	(2) Implied Victimization Rate
Pct College = 10%	0.16	0.14
	(0.02)	(0.02)
Pct College = 20%	0.22	0.19
	(0.02)	(0.02)
Pct College = 40%	0.26	0.16
	(0.02)	(0.02)
Pct College = 60%	0.28	0.11
	(0.02)	(0.02)
Pct College = 100%	0.45	-0.03
	(0.04)	(0.03)
Median Income = 30k	-0.00	-0.03
	(0.01)	(0.01)
Median Income = 40k	0.06	-0.01
	(0.01)	(0.01)
Median Income = 70k	0.16	-0.01
	(0.01)	(0.01)
Median Income = 100k	0.14	-0.07
	(0.01)	(0.01)
Median Income = 130k	0.15	-0.08
	(0.02)	(0.02)
Median Age = 30	0.10	0.05
	(0.01)	(0.01)
Median Age = 40	0.12	0.06
	(0.01)	(0.01)
Median Age = 45	0.16	0.09
	(0.01)	(0.01)
Median Age = 50	0.25	0.20
	(0.02)	(0.01)
Median Age = 55	0.49	0.42
	(0.03)	(0.02)
Pct Urban = 25%	0.07	0.14
	(0.01)	(0.01)
Pct Urban = 50%	0.01	0.19
	(0.01)	(0.01)
Pct Urban = 75%	0.04	0.33
	(0.01)	(0.01)
Pct Urban = 100%	0.09	0.53
	(0.01)	(0.01)
Unemp Rate = 3%	-0.07	0.23
	(0.01)	(0.01)
Unemp Rate = 5%	-0.02	0.18
	(0.01)	(0.01)
Unemp Rate = 7.5%	0.01	0.12
	(0.01)	(0.01)
Unemp Rate = 10%	0.05	0.07
	(0.01)	(0.01)
Median HH Size = 2.5	-0.19	-0.14
	(0.00)	(0.01)

Table A-5 Percent Change in Per Capita Complaint Rate and Implied Victimization Rate by Demographic Factors for Fraud Complaints: Additional Values

	(1) Complaint Rate	(2) Implied Victimization Rate
Median HH Size = 3	-0.25	-0.19
	(0.01)	(0.01)
Median HH Size = 3.5	-0.34	-0.26
	(0.01)	(0.01)
Median HH Size = 4	-0.44	-0.35
	(0.01)	(0.01)
Pct Asian = 5%	0.04	0.03
	(0.01)	(0.01)
Pct Asian = 10%	0.01	-0.02
	(0.01)	(0.01)
Pct Asian = 25%	-0.03	-0.12
	(0.01)	(0.01)
Year=2015	-0.04	-0.04
	(0.00)	(0.00)
Year=2016	0.02	0.02
	(0.00)	(0.00)
Year=2017	-0.03	-0.03
	(0.00)	(0.00)
Year=2018	0.08	0.09
	(0.00)	(0.00)
Observations	143020	143020

Note: Estimates are based upon equation (1) estimated after weighting each zipcode by its 2010 population. Robust standard errors are in parentheses. The estimates of demographic effects are reported at selected values relative to an omitted group; the baseline, omitted category is 0% for percentage black, percentage Hispanic, percentage Asian, percentage college educated, and percentage urban, 20,000 dollars for median household income, 2 people for median household size, 0% for the unemployment rate, and 25 for median age. The first column uses the complaint rate, and the second column the complaint rate multiplied by weights from Raval (2019b) in order to construct an implied victimization rate.