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The early impact of COVID-19 on local commerce: Changes in spend across neighborhoods and online

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Abstract
We document a number of striking features about the initial impact of the pandemic on local commerce across 16 US cities. There are two novel contributions from this analysis: exploration of neighborhood-level effects and shifts between offline and online purchasing channels. In our analysis we use approximately 450 million credit card transactions per month from a rolling sample of 11 million anonymized customers between October 2019 and March 2020. Across the16 cities we profile, consumers decreased spend on the set of goods and services we define as “local commerce" by 12.8% between March 2019 and March 2020. Growth in all 16 cities was negative. Consumers shifted a substantial share of local commerce spend online, such that year-over-year growth in online spend was small, but positive, at 1.5%. With respect to grocery and pharmacy purchases, online spend grew at least three times as fast as offline spend. Overall spend declines were uniform across neighborhoods of differing median household income, though lower-income neighborhoods experienced the highest proportion of extreme negative declines. We also find evidence that many low-income neighborhoods are increasing spend on online grocery slower than others, but increasing their use of online restaurants the fastest. Consumers in low-income neighborhoods also tend to live farther from the grocery stores at which they shop. Compared to their counterparts in higher-income neighborhoods, consumers in low-income neighborhoods have not been more likely to shop at grocery stores closer to where they live since the onset of the pandemic.

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1 Introduction

On January 21, 2020 the first case of COVID-19 was diagnosed in Washington state. By May 23, 2020, the case load across the US had grown to over 1.6 million people with nearly 100,000 fatalities. As the virus spread, businesses across the country shuttered their doors to slow contagion, leading to widespread job loss. Between March 14 and May 23, nearly 40 million people filed initial unemployment claims. In the midst of economic calamity, policy leaders at all levels have struggled to understand the scale and scope of the economic shock rippling through the economy. At the federal level, Congress mobilized the largest economic stimulus effort in history, directing trillions of dollars in financial assistance to individuals and businesses. At such great cost, it is imperative this assistance reaches those most in need.

The aim of this research is to use JPMorgan Chase Institute data to understand the impact of the pandemic on the supply and demand of local commerce across US cities.[1] While the scope of the pandemic is global, we experience the impacts locally. Consumers need to be able to acquire critical goods and services where they live. Producers need to be able to service a stable set of consumers, most often those in the same community. Therefore, to understand the strain placed on the local economic ecosystem requires a *place-based* view of local commercial activity that characterizes the *everyday* interplay between consumers and producers in a community.

To bring this interplay into focus, we construct a "local commerce" economic view using a subset of credit card transactions that typify everyday goods and services transacted between local buyers and sellers. This local commerce view differs from other publicly available series because it includes a broader set of goods and services to reflect the modern, more service-based economy.[2] We further restrict to such goods and services that are well represented by card transactions. Such representation is important in studying consumer substitution patterns, such as toward online goods and services. Using these conditions, we define local commerce (LC) to include the following goods and services: clothing, grocery, fuel, general goods, home maintenance goods and services, local leisure goods and services related to arts and sporting activities, pharmacy, personal care and

[1] The collection of JPMorgan Chase Institute research related to the impact of COVID-19 can be found here.

[2] This is the case with the Census Monthly Retail Trade Survey, which reports on retail goods and food services. The Bureau of Economic Analysis estimates that consumers spent more than twice as much on services as goods in February 2020.

professional consumer services, restaurants, and local private and public ground transportation.[3,4]

The following analysis of LC relies on approximately 450 million credit card transactions per month made by a rolling sample of 11 million customer accounts.[5,6] The richness of these transaction-level data allows us to couple attributes of the consumer with those of the establishment at which the purchase was made. This includes information on the distance between the consumer's residence and the establishment's location.[7] These transactions have broad geographic coverage, but we focus on 16 cities with a sufficient number of observations to allow for further detailed analysis at the neighborhood level. After this initial analysis is published, we plan to release a set of online companion resources that enable national and local public policy officials to track the performance of local commerce going forward.

We document a number of striking features from our initial analysis. Across the 16 cities we profile, we measure a 12.8% decline in year-over-year growth in LC spend in March 2020.[8] We also find wide variation in spend growth between and within cities and online versus offline. LC spend across the 16 cities sharply declined in March, regardless of local lockdown or COVID-19 outbreak severity, with declines ranging from 2.8% (Phoenix) to 16.6% (San Francisco). Within and across cities, LC spend declines were relatively uniform across neighborhoods featuring a wide range of household median income. However, a disproportionate share of low-income neighborhoods

[3]General goods include department stores, discount stores, large non-specific online retailers, and other miscellaneous retailers like florists and books stores that sell everyday goods. Major categories of personal care services include salons and dry cleaners. Professional consumer services examples include veterinary, legal, and childcare services.

[4]Major categories of goods and services not included in local commerce are automobile-related goods and services, communication services, education services, travel-related leisure, flights, and accommodation.

[5]To calculate the measures used in this analysis each month, we select customer credit card accounts with at least 10 transactions in *both* the target month (e.g. February 2020) and same month a year before (e.g. February 2019). This sample selection protocol governs accounts in the analysis through February 2020. In March 2020, in order to reduce measurement error due to unusually high attrition and/or spend reductions, precisely the change we are seeking to explore, we reuse the sample of customer accounts that cleared the screen in February 2020.

[6]In an effort to provide analysis to the public as quickly as possible, we have focused on the use of credit card transactions only. Our typical analysis of LC spend would rely on both credit and debit card transactions. Restricting to credit card users has a material impact on the sample. Credit card holders skew higher income, and according to the Survey of Consumer Finances, credit card holders spend more on basic goods like food. Recent results from Visa also show the recent spend declines have been more severe on credit versus debit cards.

[7]This work is part of broader efforts by other public and private institutions to use proprietary data to provide real-time analysis of the impact of COVID-19. Other examples we are aware of as of this writing include Alexander and Karger (2020); Baker et al. (2020a,b); Chetty et al. (2020) for the US and Carvalho et al. (2020); Chen et al. (2020); Andersen et al. (2020); Chronopoulos et al. (2020) internationally. We show similar high-level findings where there is overlap on US data.

[8]Our LC series typically shows growth rates in the range of 4 percentage points (pp) above the Census Monthly Retail Trade Survey. Month-to-month movement in the two series is highly correlated. The Census survey reports a seasonally adjusted year-over-year decline of 6.2% in March 2020.

experienced extreme negative spend declines. Consumers shifted their share of LC spend online by 4.6pp, such that online growth in LC spend was still positive, but just 1.5%. In March, only grocery and pharmacy spend grew relative to the previous year, with extraordinary rates of growth online.

In this initial piece, we provide further detail on changes in spend in consumer food categories: groceries and restaurants. At a high level, in March 2020, overall spend on food decreased between 5.0% for the lowest-income and 8.4% for the fourth-highest income-quintiles. Unsurprisingly, within food, consumers shifted much of their spend toward grocery and away from restaurants. We find proportional changes in food spend allocated to groceries versus restaurants to be relatively even across neighborhoods of all income levels in March 2020. However, neighborhoods with the lowest increases in online grocery spend are more likely to be low-income. Consumers in low-income neighborhoods also tend to live farther from the grocery stores at which they shop. Coupling both disadvantages suggests that despite similarity in overall spend patterns on food, consumers living in low-income neighborhoods may be more at risk for COVID-19 when acquiring groceries.

2 Changes in local commerce across cities

The pandemic created severe supply and demand shocks. Many producers are shutdown or serving consumers at a distance, while simultaneously incorporating social distancing guidelines into their production processes. At the same time, consumers have less income to spend on average and are less inclined to physically patronize businesses for fear of contagion. As a consequence, consumers in our cities decreased LC spend by 12.8% between March 2019 and March 2020.

As seen in Figure 1, all 16 cities enjoyed robust LC growth in February 2020; by March, all experienced significant declines. The heaviest decline was in San Francisco (16.6%), the first city with a stay-at-home order starting on March 17. The next heaviest declines were in Chicago, New York, and Detroit: three major cities which, along with New Orleans, have the highest COVID-19 case rates to date. Even cities with limited outbreaks in March experienced high declines.[9] The best performing city in our analysis was Phoenix, where consumer spend still decreased by 2.8%.

[9]We note that Houston also shows large declines, but it is unclear whether the bigger driver of this decline was the direct effect of the pandemic or the concurrent economic shock from its link to the oil and gas industry at a time of historically low energy prices.

These results show that, even though the onset of COVID-19 occurred at different times for different cities, consumers across cities pulled back their spend in a narrow time window. The correlated response suggests that consumer sentiment and policy interventions during the pandemic can drive growth outcomes.

While these high-level results inform the scale of the current economic crises across the US, policy makers can better direct aid to those most in need with information on how the pandemic is impacting neighborhoods of differing socioeconomic status. To aid this effort, we provide analysis across neighborhoods by neighborhood income. Throughout the analysis, we use ZIP codes as proxies for neighborhoods. Within each city, we separate neighborhoods into neighborhood income quintiles by city using the neighborhood's median household income as reported in the American Community Survey 5-year data for 2014-2018. Figure 2 shows that all consumers across neighborhood income quintiles increased LC spend in February, and then decreased LC spend in March. High-income neighborhoods experienced the largest contraction in March 2020 at -13.6%.

Despite the relative similarity in neighborhood LC spend growth in each quintile, we find that low-income neighborhoods experienced a disproportionate share of extreme spend declines. We define a severe spend decline as a drop of more than one standard deviation (>15.1%) below the average drop across all neighborhoods (-9.5%).[10] As can be seen in Figure 3, 11.5% of the lowest-income neighborhoods, and 6.9% of the neighborhoods in the next highest quintile, are in the severe spend decline category. The fact that low-income neighborhoods were more likely to experience severe declines while high-income neighborhoods had the largest average decline may be a result of differences in the choices available to residents. For example, low-income neighborhoods may be more exposed to job losses while high-income neighborhoods are able to decrease a large share of discretionary spend. We unpack more of the differences across neighborhood income in later sections.

Before further decomposing LC spend changes, we show that LC spend has been more resistant to spend declines than goods and services not included in LC spend. As Figure 4 shows, we find that consumers in our sample responded to the pandemic in March by decreasing their overall spend on goods and services on credit cards by 21.6%. This is an alarming figure for the US economy,

[10]The mean decline in LC spend across all neighborhoods we report was slightly lower than the overall decline in LC spend.

in which consumer spend accounts for almost 70% of Gross Domestic Product.[11] Local economies experienced a material contraction overall, but the spending reductions were greater for goods and services consumed primarily away from home. The gap between LC spend growth and non-LC spend growth widened from January to February, with the greatest gap in March. The consistently higher growth in LC spend implies that the LC share of total spend increased as the pandemic worsened. In order to better understand the local economic conditions across the US, we focus on LC spend for the remainder of the analysis.

3 Changes in online local commerce

The rise of online commerce over the last three decades has already made deep structural changes in how consumers interact with local producers of goods and services. The pandemic has both accelerated the use of online channels and broadened its use across the population. In efforts to reduce time away from home, we find the online share of LC spend grew from 42.9% in February to 47.5% in March, a difference of 4.6pp. As a result, online LC spend still grew, though at a notably slower pace in March (1.5%) relative to February (20.2%), as can be seen in Figure 5.

We find that the resilience of online LC in March was uneven across cities. For most, online LC spend growth was positive. However, many of the cities with the severest overall spend declines (Chicago, New York, Detroit, and Houston) had declines in both online and offline spend (Figure 6). As expected, every city we observed saw significant declines in offline spend. San Francisco experienced the most significant contraction with a growth rate of -31.0% in offline spend, followed by Seattle (-27.7%), New York (-24.9%), and Los Angeles (-24.5%).

Overall, growth in online commerce did not materially differ by neighborhood income (we find differences for specific goods and services below). Figure 7 shows the distribution of neighborhood LC spend growth across neighborhood income and online versus offline. In March, we observe sharp contractions in offline spend and increases in online spend across each neighborhood income quintile. Median growth was similar across neighborhood income, though as with overall spend, declines in online spend were more likely in low-income neighborhoods. Furthermore, it is notable that across all neighborhood income quintiles, nearly half of neighborhoods reduced their spend

[11] The US Bureau of Economic Analysis reported Gross Domestic Product was $19.073 trillion in 2019. Of that, Personal Consumption Expenditures accounted for $13.280 trillion

offline *and* online.

4 Changes by product and channel

The LC view captures, by design, the exchange of a subset of goods and services that are well-represented on cards and specific to interactions between local consumers and producers. This view highlights dynamics in not just the retail goods portion of local economy, but in the consumer services sector as well. Here, we study how the pandemic has changed consumer consumption patterns across the individual goods and services contained in this view. Our results show dramatic shifts in the composition of LC spend for goods and services overall and across online versus offline channels.

As seen in Figure 8, consumers dramatically decreased their consumption of services related to intra-city transportation (e.g. private car service and public transit), clothing, personal care services (e.g. salons and dry cleaners), restaurants, leisure-related arts and sports services, and fuel. By contrast, there was either no change, or limited contraction, in spend related to goods and services one can consume at or close to home. These include home goods and services (e.g. furniture stores, hardware stores, and landscaping services), professional consumer services (e.g. veterinary, legal, and childcare services), and general goods (e.g. department stores, discount stores, large non-specific online retailers, and other unclassified producers like florists and book stores that we consider to sell everyday goods). Finally, there were two categories that experienced dramatic increases in spend: grocery stores and pharmacies. Figure 9 shows that the share of LC spend at grocery stories and pharmacies grew from 15.6% to 23.9% and from 2.2% to 2.7%, respectively, between February and March 2020. For the remaining LC goods and services, the share declined from 82.2% to 73.4% with the largest decrease in the restaurant share.

Further decomposing LC spend growth for goods and services purchased online versus offline in March 2020 reveals that the online channel was critical in supporting the acquisition of key goods and services (Figure 10). Online spend on groceries more than doubled, with pharmacies general goods, and restaurants also increasing their online provision substantially. For other goods and services, online provision has not proved a lifeline during the pandemic. Across online and offline channels, personal care services, clothing, and private and public ground transportation

have decreased substantially. Declining spend across both channels suggests consumers have far less need for these goods and services when largely confined to the home.

5 Changes in food spend and distance

In this final section, we focus on food spend at groceries and restaurants as one way to examine the impact of the pandemic on the well-being of residents across neighborhoods. We find that in March 2020, residents across neighborhoods largely reduced spend on food at similar rates and allocated similar proportions of total LC spend to food. However, we find differences in the use of online food channels across neighborhoods. Consumers increased their spend on online groceries and restaurants across the board, but consumers in lower-income neighborhoods were less likely to increase online grocery spend and more likely to increase online restaurant spend. Variation in increases in grocery spend is also much wider across cities online than offline, suggesting that the existing infrastructure for online groceries is a potential impediment for rapid expansion in access to online groceries. A small pilot program by the US Department of Agriculture was widely expanded in March to allow use of Supplemental Nutrition Assistance Program (SNAP) benefits for online grocery purchases.[12] Efforts like these to increase the use of online groceries may be hampered by supply constraints in the short-term.

In addition to spend, we study the offline physical accessibility of grocery stores in a neighborhood. To do so, we measure the distances between consumers' home neighborhoods and the grocery stores at which they transact, then calculate the median distance of those transactions for each consumer neighborhood.[13] We find that consumers in low-income neighborhoods are more likely to live farther from their chosen grocery stores. Moreover, during the pandemic, median distances dropped the most for consumers in high-income neighborhoods. Our results by channel and median distance show that despite consistent shifts in grocery spend across neighborhoods of different economic means, consumers in many low-income neighborhoods are not accessing groceries from nearby stores or increasing their online grocery purchases to the same extent as their counterparts in high-income neighborhoods. Both elements increase time away from home, and

[12] Current details of the program and availability can be found on the USDA website.

[13] We only have information on the ZIP code of the consumers' home location and the ZIP code of the establishment at which they transaction. Therefore, we calculate distances between ZIP code centroids.

therefore increase the risk of contagion associated with simply buying food.

Finally, *we find that city-specific dynamics can deviate from broad patterns observed across cities*, which suggests that our within-city results are particularly useful for local policy makers.[14] To highlight our within-city results, we use New York City as an example. As with other cities, lower-income neighborhoods had higher growth in offline grocery spend and higher-income neighborhoods had higher growth in online grocery spend. However, unlike other cities, the cross-quintile pattern in median retail distance is somewhat U-shaped insofar as consumers in both low- and high-income neighborhoods tend to live relatively close to their chosen grocery stores.

5.1 Changes in spend within food and online

Consumers across neighborhoods are changing their total spend on food in similar ways, but the slower increase in the use of online groceries in many low-income neighborhoods suggests differential access to a key low-risk food channel during the pandemic. Overall spending on food declined by 5.0% for the lowest-income quintile and 8.4% for the fourth-highest-income quintile in March, despite high rates of growth on groceries (Figure 11). The greater decline for higher-income neighborhoods is driven by a slightly higher shift away from restaurants. We find that changes in spend shares were largely even for groceries and restaurants across consumers by neighborhood income quintile. Figure 12 shows that in February, total grocery and restaurant spend as a share of LC spend was about 16% and 20%, respectively, across neighborhoods. In March, all consumers reallocated toward grocery such that grocery and restaurants spend shares were about 24% and 13%, respectively. Average reallocation within both food categories toward online was also relatively uniform across neighborhood income.

However, examining the distribution of growth rates in online groceries by neighborhood income shows that individual neighborhood experiences can be quite different from the national average (Figure 13 (a)). Lower-income neighborhoods are less likely overall to increase online grocery spending as quickly as higher-income neighborhoods. The neighborhoods with the 25th percentile growth rate in the first and second quintiles experienced online grocery spend growth rates that were 12.6pp and 17.4pp below the corresponding growth rate for the 25th percentile neighborhood in the fifth quintile (54.6%). Interestingly, we find there are a subset of neighborhoods in the first income

[14] Our forthcoming companion figure and data resources contain details on these results specific to each city.

quintile with particularly high growth in online spend on groceries. This may reflect the effects of the new SNAP pilot program in March.[15] Otherwise, the 25th, 50th, and 75th percentile of the distribution in each of the other neighborhood income quintiles rises with income, as expected.[16]

At the same time, low-income neighborhoods are increasing their online restaurant spend faster than high-income neighborhoods at each point of the neighborhood growth distribution (Figure 13 (b)). The median growth rate for first quintile neighborhoods was 24.4%, while the growth rate for the fifth quintile was just 12.1%. Furthermore, the lowest-income quintile is the only one in which online restaurant spend increased in more than three-quarters of neighborhoods. Differential access to groceries versus restaurants in low- versus high-income neighborhoods, both online and offline, may be part of the explanation for these differences.

We also find that the increase in online grocery use was substantially higher in cities where the online share of groceries was already high before the pandemic. Figure 14 (a) shows that offline grocery growth in March was between 17.4% (San Francisco) and 32.9% (Miami), a relatively tight range. However, as shown in 14 (b), the range for online grocery growth in March was very wide, from 28.7% (Houston) to 194.4% (San Francisco). The cities with the 4 highest rates of growth in online grocery in March were also those cities with the highest share of grocery spend online in February (San Francisco had the highest share in February, at 20.7% of total grocery spend). This suggests that the ability to shift grocery spend online was in large part determined by the existing market size and infrastructure for grocery delivery. Online grocery platforms, much more than other online goods and services, have large fixed costs to delivering in a city that limit their ability to expand.[17] Though online groceries are clearly trying to increase capacity, these fixed costs are likely to constrain expansion of this service in many areas in the short run.

5.2 Changes in neighborhood median retail distance to groceries

The distance between consumers and the establishments they visit is another important, non-monetary dimension of accessibility to retail goods, particularly now when travel outside the home

[15] Although SNAP transactions themselves do not appear in our data, the effects of the program could lead to expanded availability and awareness of the program in low-income neighborhoods such that there is an increase in online grocery spending in the set of transactions that we do observe.

[16] Previous research shows that higher-income households spend more on online groceries. See Farrell et al. (2018) and Relihan (2017).

[17] This is discussed at greater length in Relihan (2017).

is higher risk.[18] In our previous work, we explored the variation in this distance to illuminate local patterns of disparity across consumers within a city that could not be easily identified with available economic data.[19] Our median distance measure accords with intuition insofar as distances are lower in downtown areas and more dense retail areas. It also tends to move slowly across years, because residents and establishments move in and out of neighborhoods at low rates.[20]

Of deep concern in general, and during the pandemic in particular, is the median retail distance for groceries.[21] In Figure 15(a), we observe that while in March 2019 consumers in the median high-income neighborhood traveled virtually the same distance to grocery stores as consumers in the median low-income neighborhood, there were far more high-income neighborhoods that featured shorter distances than low-income neighborhoods. In other words, consumers in high-income neighborhoods were more likely to travel shorter distances for access to groceries than their low-income counterparts. In March 2020, the median distances for grocery fell for all quintiles, but they fell the farthest for consumers in the highest-income neighborhoods while consumers in the lowest-income neighborhoods experienced little change (Figure 15 (b)). We also note that for the fourth and fifth quintile neighborhoods, the 25th percentile distances dropped by 1.1 and 1.0 miles, respectively. Corresponding distributional shifts for the remaining quintiles were also negative, but much more modest. Combined with our results by channel, the disparity in distance changes suggests that many lower income neighborhoods are likely not accessing online groceries and nearby grocery stores to the same extent as consumers in high-income neighborhoods. This wedge in physical access to safer grocery channels is widening during the pandemic.

5.3 Results specific to New York City

In this section, we examine the within-city spend patterns between neighborhoods of different median household income in the New York City metropolitan area. These within-city patterns for New York may be instructive for dense neighborhoods as well as those hit hard by the crisis. To anchor

[18] To reiterate, we measure retail accessibility by the median ZIP code centroid to centroid distance between the consumers in a ZIP code and the within-city brick-and-mortar establishments at which they transact.

[19] See Farrell et al. (2017) for previous retail distance analysis on New York City and Detroit by the JPMorgan Chase Institute.

[20] We do see, however, notable seasonal variation as consumers make different choices about which businesses to patronize over the course of a year.

[21] Our work specific to median distance between consumers and grocery stores is closely related to the food desert literature. See Handbury et al. (2016) for one recent example.

the discussion, Figure 16 displays the location of neighborhoods in different median household income quintiles. Manhattan south of Harlem, Westchester bordering Connecticut, and eastern parts of Long Island are some areas with high concentrations of high-income neighborhoods. Upper Manhattan, the Bronx, Brooklyn, Queens, and Newark in New Jersey have higher concentrations of low-income neighborhoods.

The correspondence between neighborhood income and increases in spend on offline versus online groceries is evident in our neighborhood spend maps (Figure 17). Offline grocery growth is more concentrated downtown, especially in those areas, like Harlem and into the Bronx, with higher concentrations of low-income neighborhoods. The highest growth rates for online grocery are in the wealthier neighborhoods of Manhattan, Westchester, and eastern Long Island.

We also find that in contrast to most other cities, median retail distance for groceries across neighborhood income in New York City is somewhat U-shaped (Figure 18 (a)). In both March 2019 and March 2020, the consumers in the lowest-income neighborhoods lived the closest to their chosen grocery stores. In March 2020, distances dropped for the median neighborhood in all quintiles, with the largest median drops in the second and third income quintiles, at 0.3 miles less for each. (Figure 18 (b)). Thus, physical access to offline groceries, as measured by median retail distance, was notably different in New York than it was across all cities. Coupled with the spatial disparities in the growth of online grocery spend, these results suggest that consumers along the income distribution are reducing grocery store travel through different means in New York City – high-income neighborhoods focused more on online groceries and low-income neighborhoods focused more on grocery spend offline close to home.

6 Discussion

The research presented here is a first effort at using a uniquely large and granular transaction-based dataset to understand the initial impact of the pandemic on local commerce across neighborhoods and online. This piece and the forthcoming companion online resources will provide measurement and analysis of impacts that local decision makers can use in their ongoing efforts to support local economies.

For our study, we create a measure of local commerce comprised of a subset of goods and services

that characterize the everyday purchases of buyers and sellers in the same geographic market. We show that across the 16 cities we profile, local commerce declined 12.8%. Declines began in March in each city regardless of local pandemic-related conditions. The uniformity in timing suggests consumer confidence about safety and broader economic conditions was important in the initial decline. They are likely to also be important factors that impact the success of reduced restrictions in spurring returns to growth. Furthermore, the decline in spend on local commerce was smaller than the 33.5% decline for other goods and services purchased on credit cards. This result is in line with local goods and services consumed near home being more robust to the current economic shock, unlike services such as flights and accommodation. Of course, these other services, while less likely to be consumed by local residents, are vitally important to local economies. They often provide a valuable source of tax revenue for local governments and support tourism-dependent cities. A return to greater spend in these categories will be an important turning point in any recovery.

We also find that the initial economic impact of the pandemic on local commerce has been harder on lower-income neighborhoods in several important ways. First, they were much more likely to experience extreme negative spending declines – about 1 in 9 neighborhoods in the first income quintile experienced local commerce spend declines in excess of one standard deviation over the neighborhood mean in March 2020 (more than a -24.6% decline). Safe access to groceries was also more difficult for many lower-income neighborhoods. Consumers in those neighborhoods were less able to expand their access to online groceries in many cases and were unable to substantially shift their spend to more local grocery stores to the same extent as consumers in higher-income neighborhoods. These are stark disparities that emerged before the vast majority of recent job losses. It is likely that differences have continued to widen.

Finally, our work shows that the initial shift of local commerce online has been limited to a smaller subset of of local commerce goods and services. In addition to groceries, pharmacies, general goods producers, and restaurants have been lifted by their ability to transact online. As online goods and services that are easier to consume at home, this is in-line with other home-favored consumption patterns. In many cases, constraints on the physical infrastructure for delivering online goods have likely limited the extent to which consumers would have preferred to move online. As this infrastructure improves, further shifts online are possible even as many local lockdown

restrictions are eased. Some spend shifted online due to the pandemic may also become permanent as consumers are introduced to new online products and new shopping behaviors become ingrained. For restaurants, one of the largest and most severely impacted industries, the shift online was smaller than that for groceries. Unlike groceries, restaurant meals purchased online require coordination between the offline producer and online service provider. This dependency is creating conflict over online restaurant revenues and spurring calls to cap restaurant delivery fees. Such caps may limit the shift of restaurant meals online.

Future work will continue to track these and other emerging trends as the pandemic's economic impacts and policy makers' responses enter new phases. That work will also move beyond the descriptive to separate out the causal impacts of specific interventions and the mechanisms underlying consumer substitution patterns offline and online. The data resources developed for this analysis will also be an ideal resource for understanding the new local commerce landscape that emerges from the crisis.

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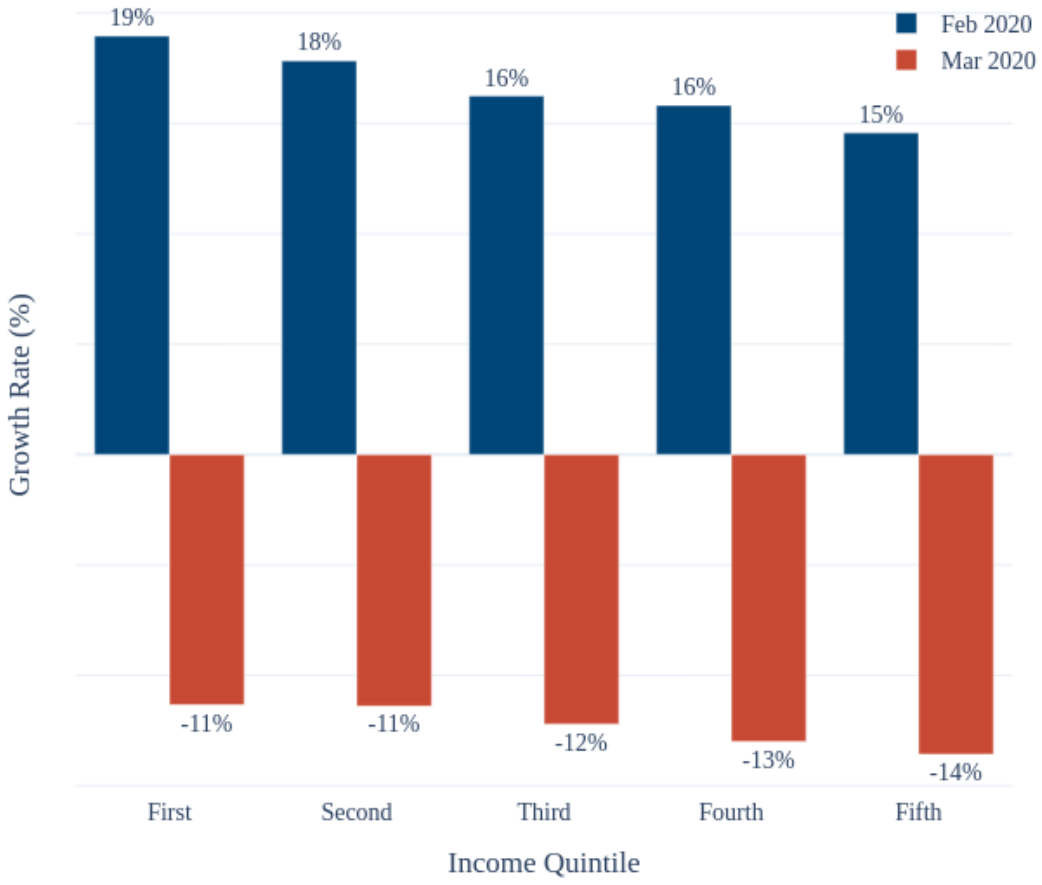
7 Figures

Figure 1: San Francisco, Chicago, New York, and Detroit experienced the sharpest declines in local commerce spend

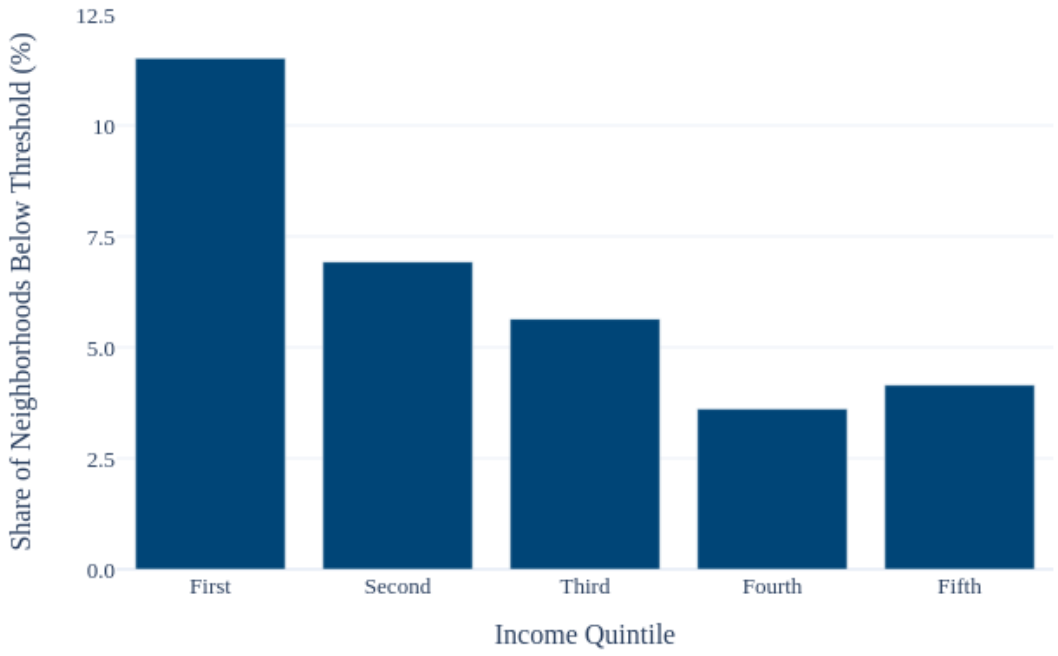
Note: This figure shows the year-over-year percent change in spend for goods and services included in local commerce for the 16 US cities included in our analysis. The national averages shown are the year-over-year growth in local commerce across all consumers, calculated at 15.9% in February and -12.8% in March 2020. Cities are Core Based Statistical Areas.

Figure 2: Local commerce spend declines were higher for consumers in high-income neighborhoods



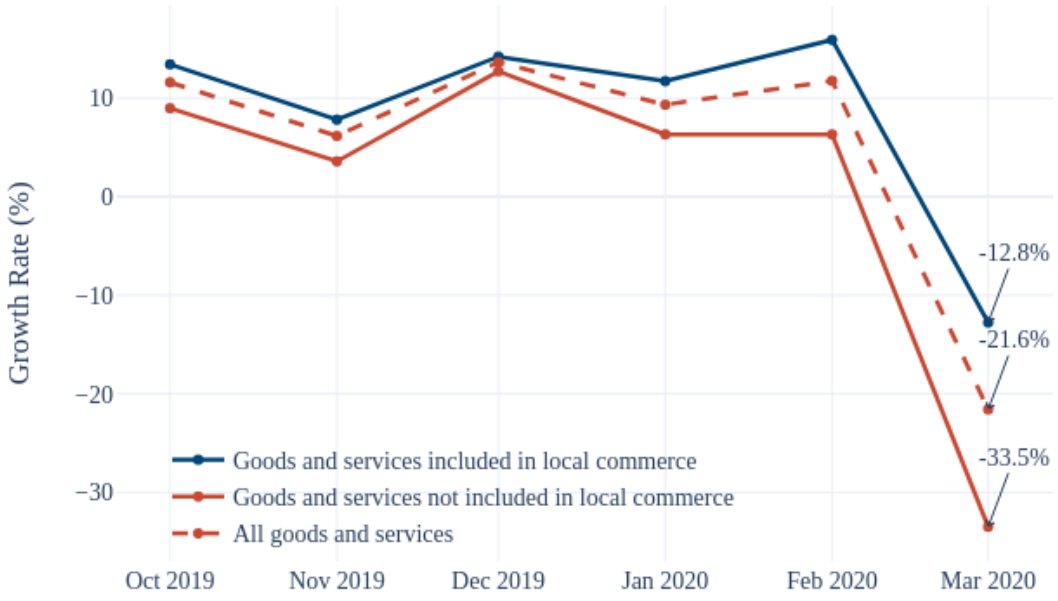
Note: This figure shows the year-over-year percent change in spend for goods and services included in local commerce by consumers' neighborhood income quintile. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

Figure 3: 11.5% of low-income neighborhoods experienced severe spending declines



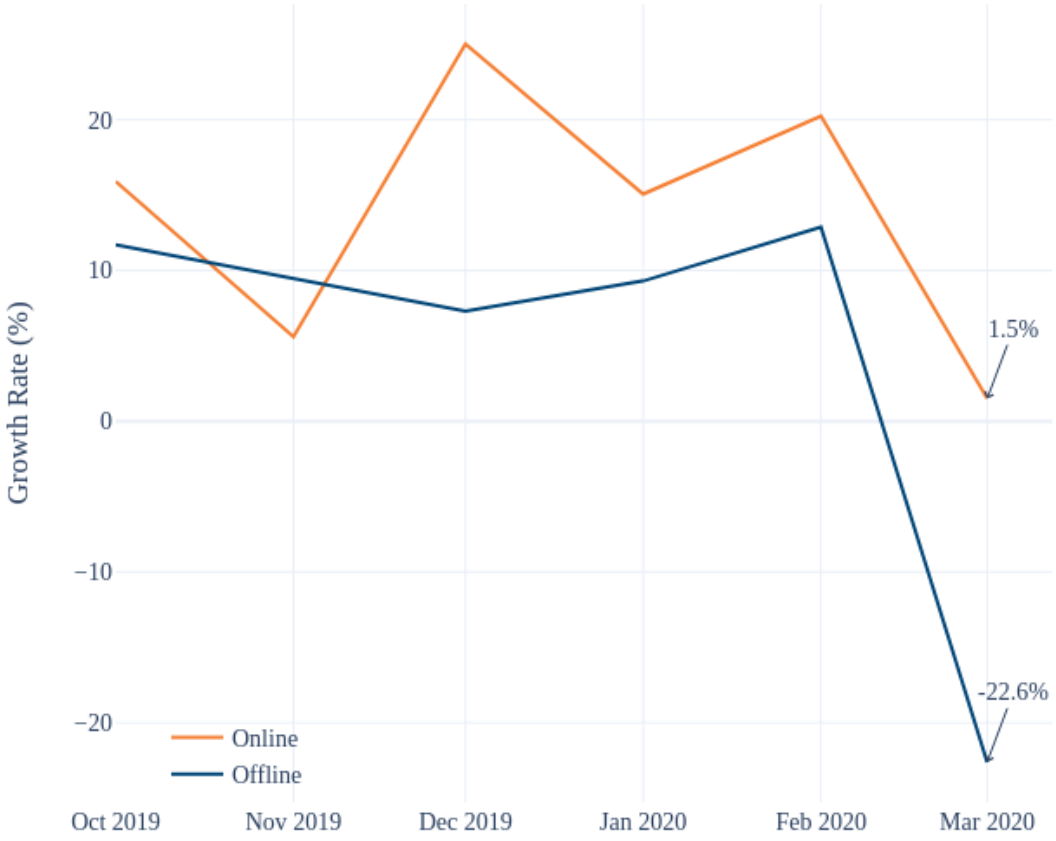
Note: This figure shows the share of ZIP codes in an neighborhood income quintile with a greater than one standard deviation fall in year-over-year LC spend (>15.1%) below the average decline in LC spend across all ZIP codes (-9.5%). The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

Figure 4: Local commerce spend declined less than overall credit card spend in March 2020



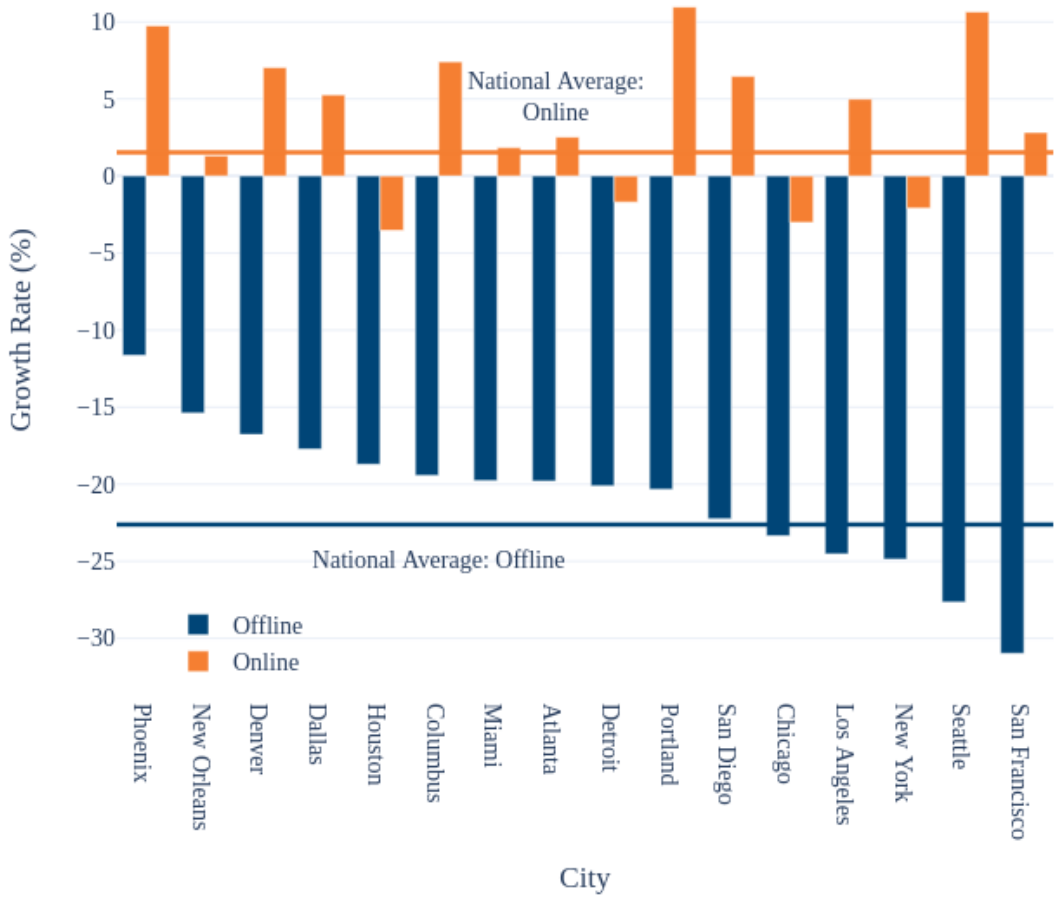
Note: This figure shows the year-over-year percent change in spend for goods and services included in local commerce and goods and services not included in commerce spend. Local commerce includes clothing, grocery, fuel, general goods, home maintenance goods and services, local leisure goods and services related to arts and sporting activities, pharmacy, personal care and professional consumer services, restaurants, and local private and public ground transportation. Major categories of goods and services not included in local commerce are automobile-related goods and services, communication services, education services, travel-related leisure, flights, and accommodation.

Figure 5: Local commerce spend online is still growing in March 2020



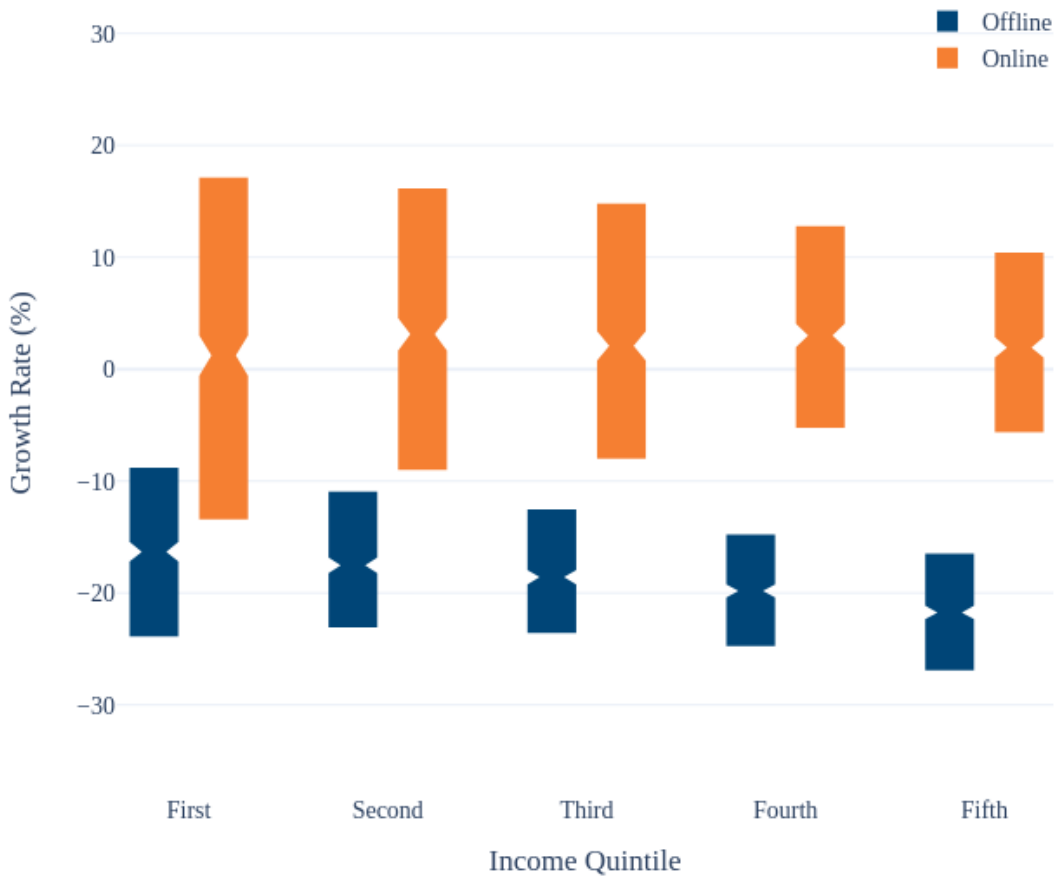
Note: This figure shows the year-over-year percent change in LC spend by online and offline channels. Concurrently, the share of LC spend online increased from 42.9% in February to 47.5% in March, a difference of 4.6pp.

Figure 6: San Francisco had the largest decline in offline local commerce spend



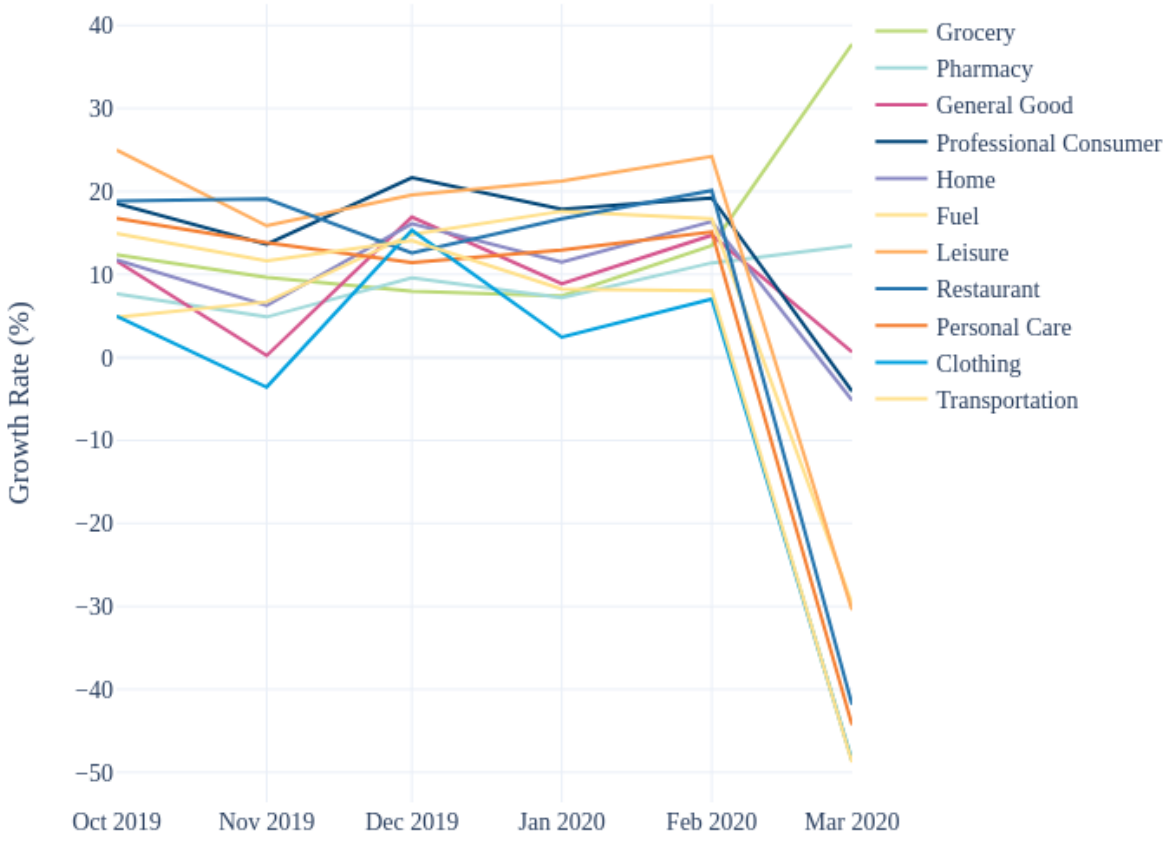
Note: This figure shows the year-over-year percent change in spend for goods and services included in local commerce by online and offline for the 16 US cities included in our analysis. The national averages shown are the year-over-year growth in local commerce across all consumers in March 2020, calculated at 1.5% for online and -22.8% for offline. A payment is considered to be online if the card was not present at the time of transaction. Cities are Core Based Statistical Areas.

Figure 7: Median growth in online retail was similar across neighborhood income



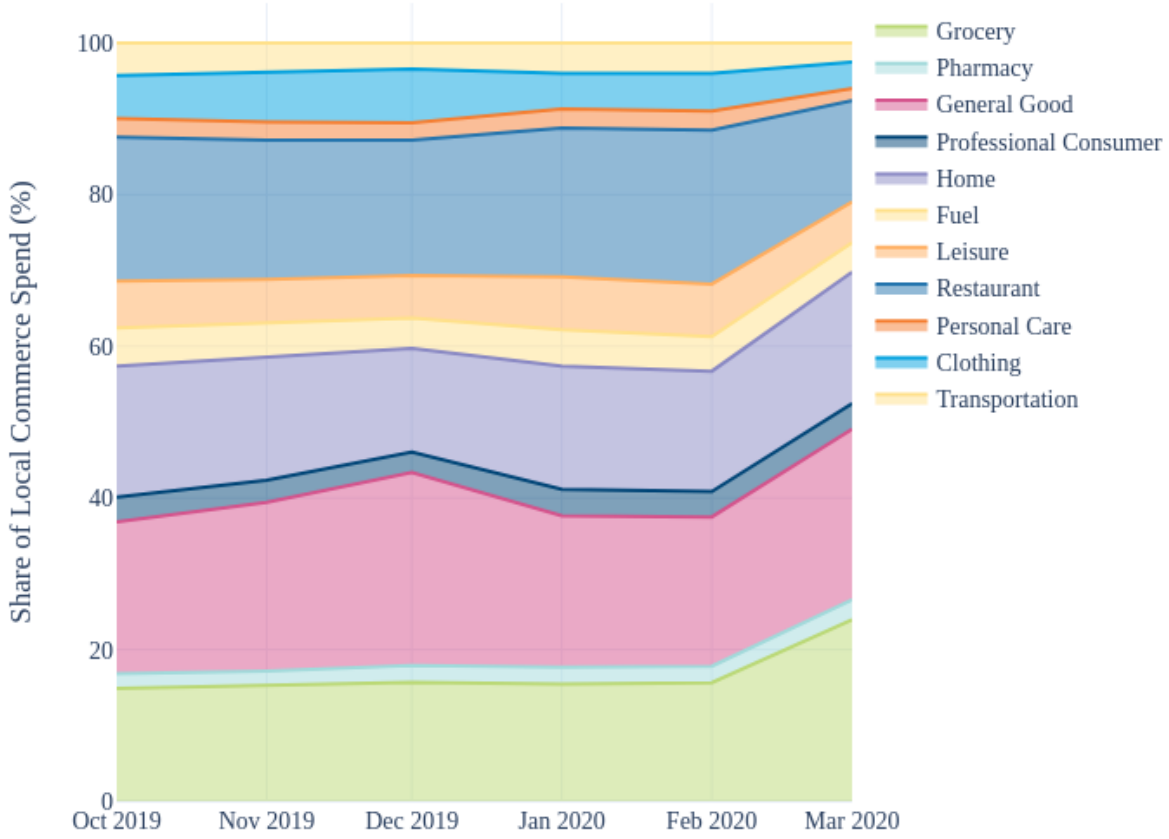
Note: This figure shows the distribution of the year-over-year percent change in local commerce spend by online and offline and neighborhood income quintile. Each box spans the 25th to 75th percentiles of neighborhood growth rates with a notch at the median growth rate. A payment is considered to be online if the card was not present at the time of transaction. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

Figure 8: Only spend at grocery stores and pharmacies increased materially in March 2020



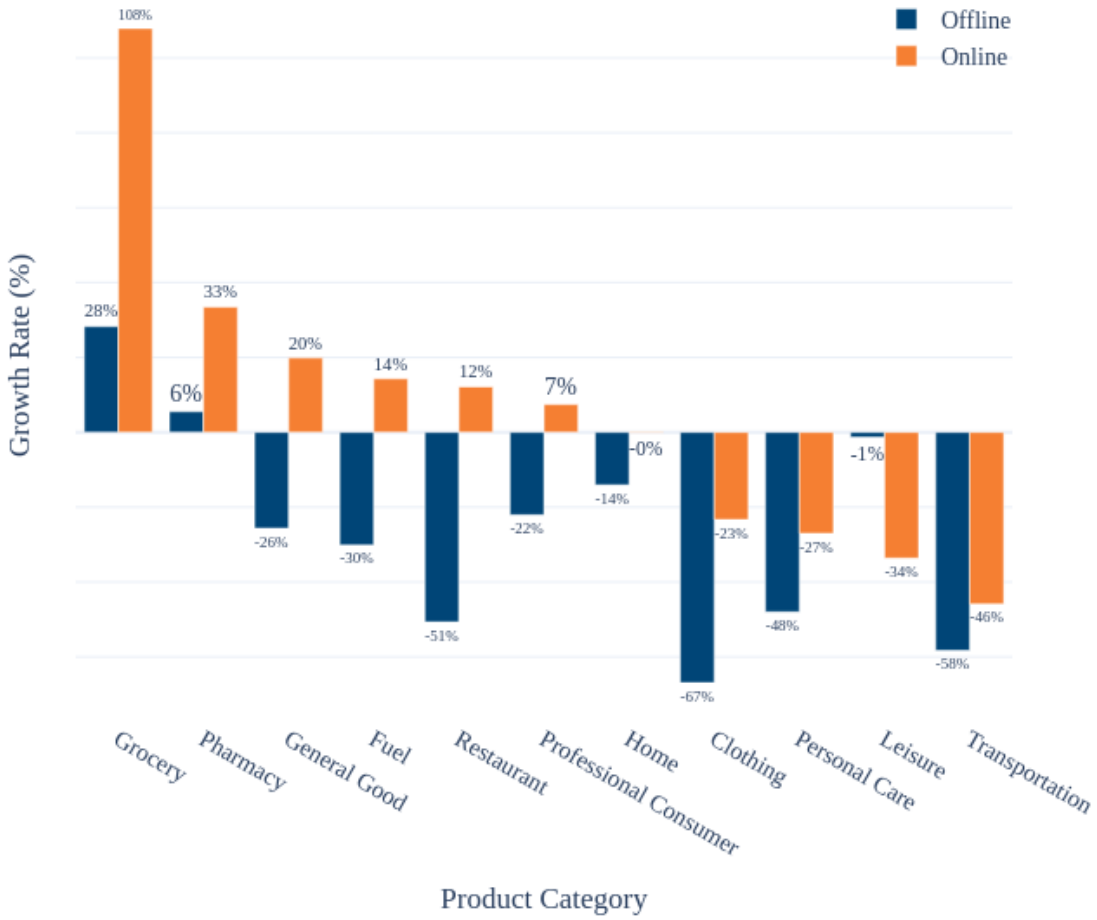
Note: This figure shows the year-over-year percent change in spend in each good and service included in local commerce. Local commerce includes clothing, grocery, fuel, general goods, home maintenance goods and services, local leisure goods and services related to arts and sporting activities, pharmacy, personal care and professional consumer services, restaurants, and local private and public ground transportation.

Figure 9: Grocery stores and pharmacies grew to 26.6% of local commerce spend in March 2020



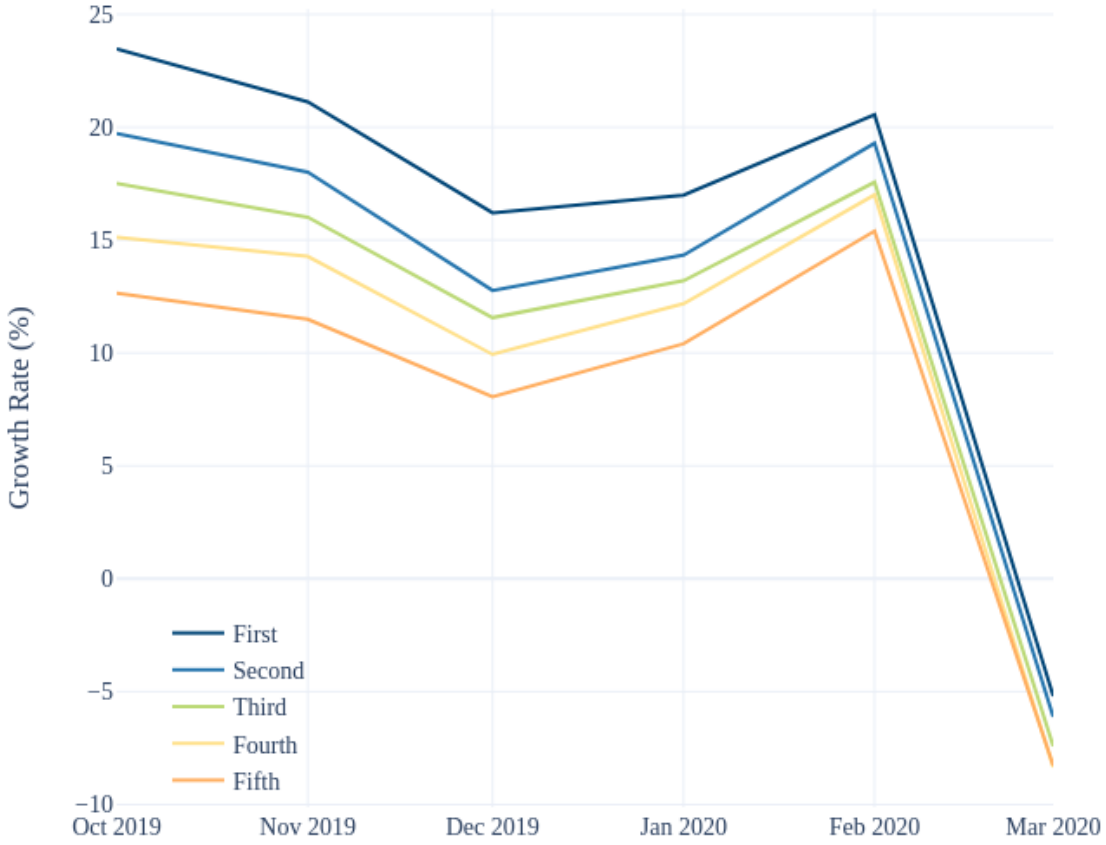
Note: This figure shows the spend share of each good and service included in local commerce. Local commerce includes clothing, grocery, fuel, general goods, home maintenance goods and services, local leisure goods and services related to arts and sporting activities, pharmacy, personal care and professional consumer services, restaurants, and local private and public ground transportation.

Figure 10: Online spend on groceries more than doubled



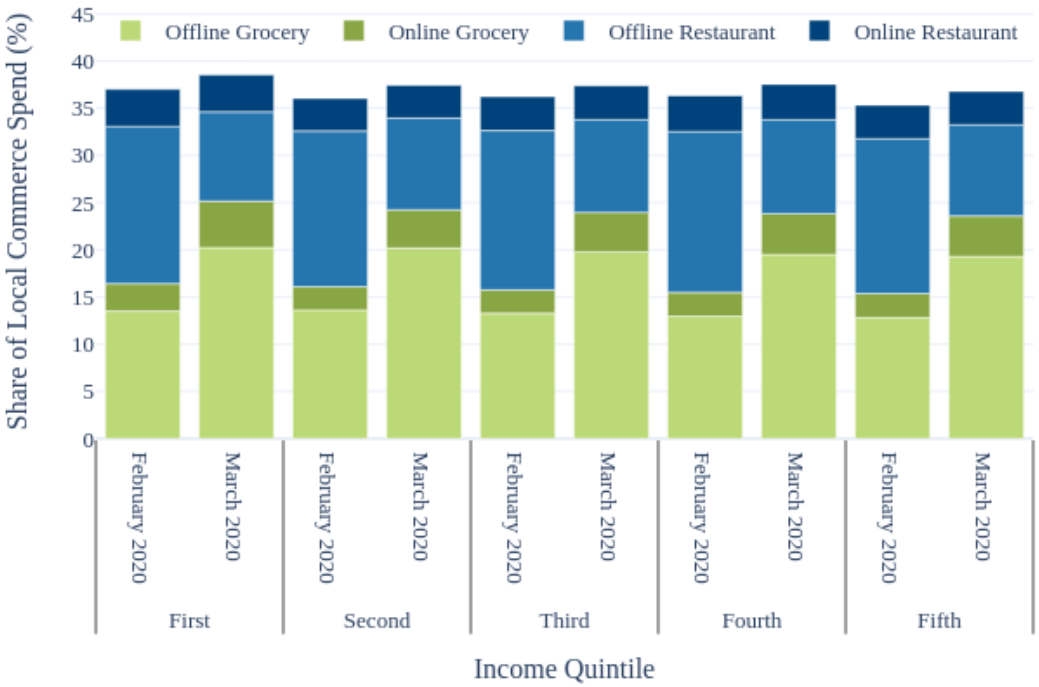
Note: This figure shows the year-over-year percent change in spend for goods and services included in local commerce by online and offline for the goods and services in local commerce. Local commerce includes clothing, grocery, fuel, general goods, home maintenance goods and services, local leisure goods and services related to arts and sporting activities, pharmacy, personal care and professional consumer services, restaurants, and local private and public ground transportation. A payment is considered to be online if the card was not present at the time of transaction.

Figure 11: Overall spend on food declined at least 5.0% in all neighborhoods



Note: This figure shows the year-over-year percent change in overall food spend by consumers' neighborhood income quintile. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

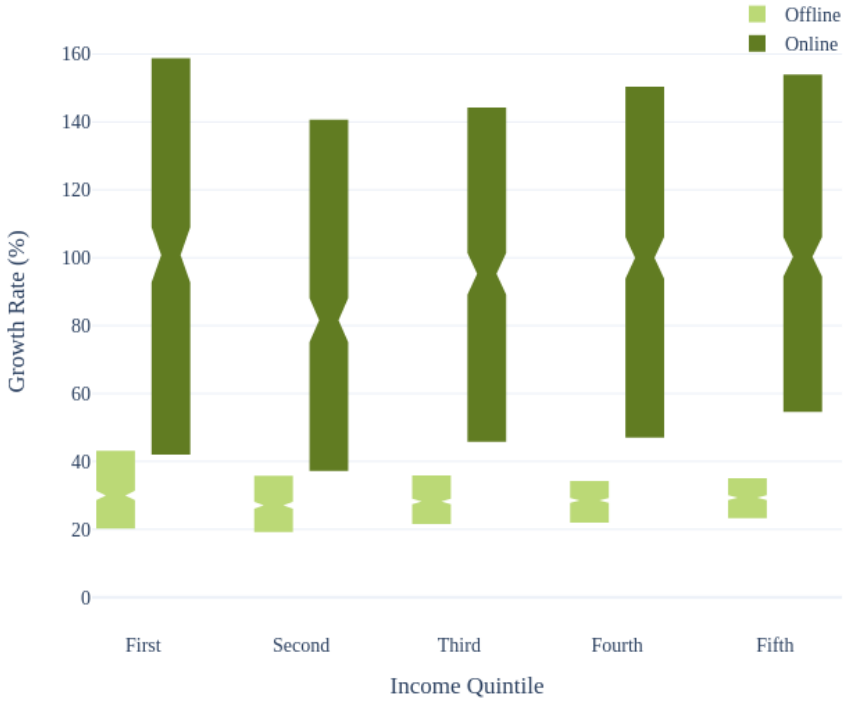
Figure 12: Food spend shifted toward groceries and online across neighborhood income



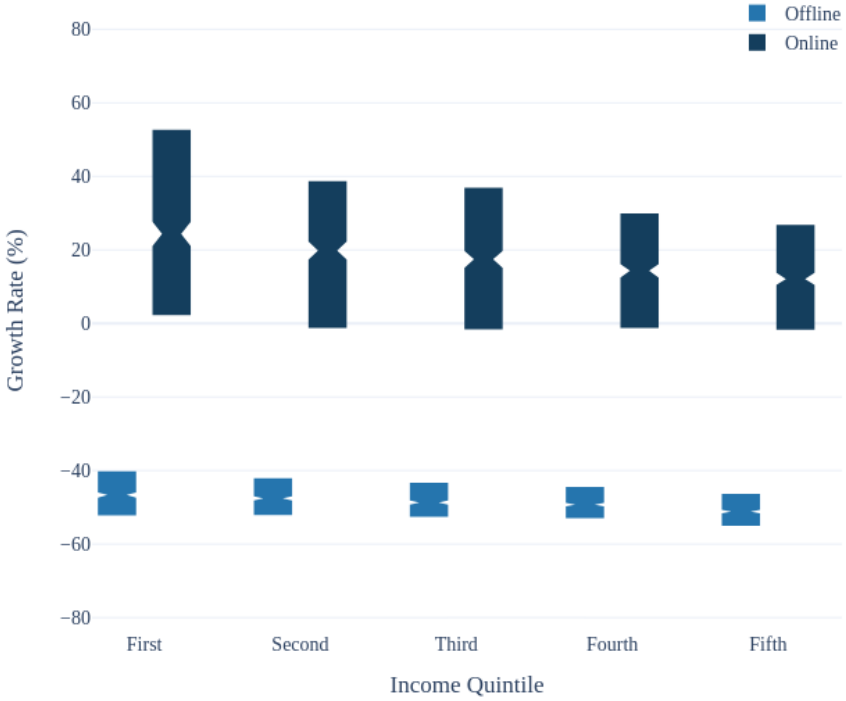
Note: This figure shows the spend share for grocery stores and restaurants, split by online and offline channels. A payment is considered to be online if the card was not present at the time of transaction.

Figure 13: Consumers are differentially increasing spend on online groceries and restaurants

(a) Grocery



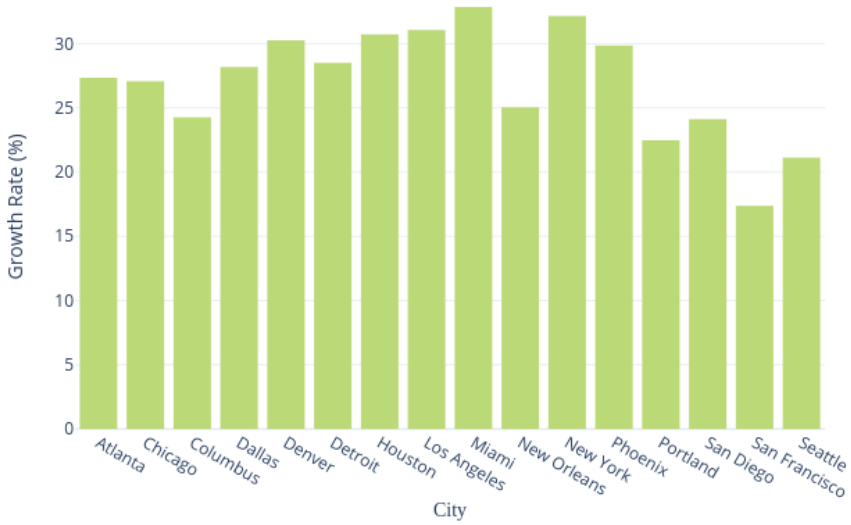
(b) Restaurant



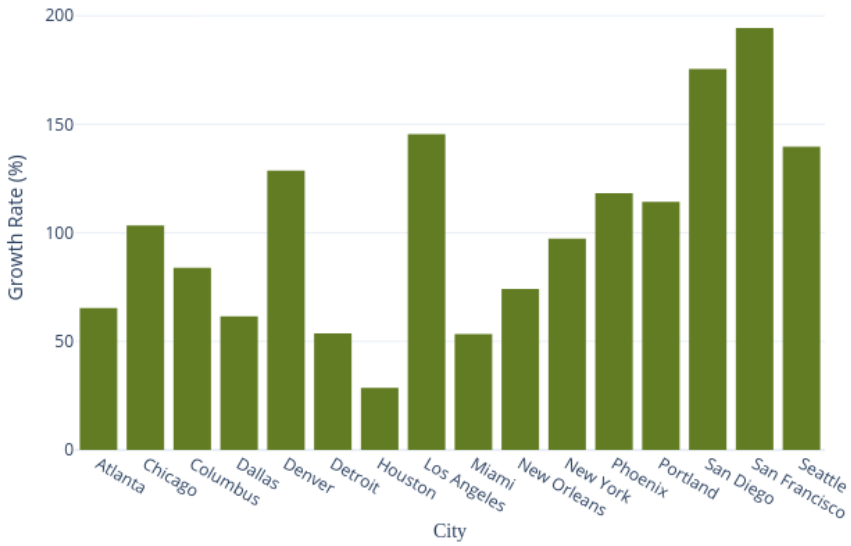
Note: This figure shows the distributions of the year-over-year percent change in grocery and restaurant spend by online and offline for each of the ZIP codes in our sample by income quintile of the ZIP code. Each box spans the 25th to 75th percentiles of neighborhood growth rates with a notch at the median growth rate. A payment is considered to be online if the card was not present at the time of transaction. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

Figure 14: Across citites there are wider differences in online than offline spend growth

(a) Offline Grocery



(b) Online Grocery

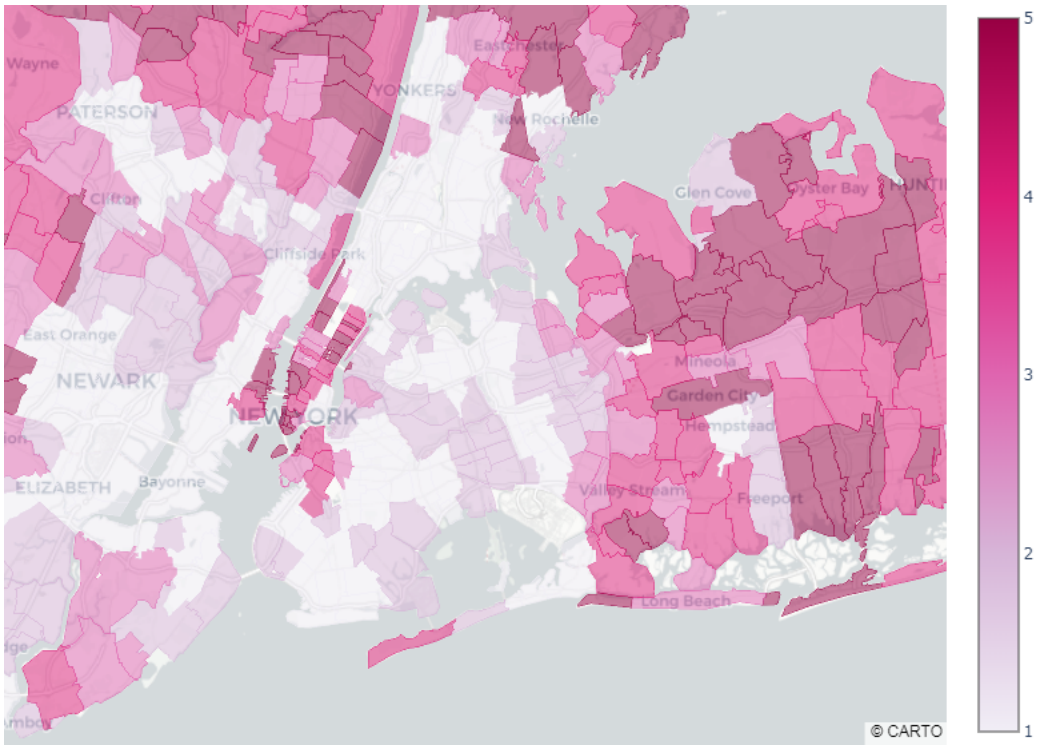


Note: This figure shows the year-over-year percent change in spend on grocery across cities by offline and online channel. A payment is considered to be online if the card was not present at the time of transaction.

Figure 15: Grocery store median distance was more likely to fall in high-income neighborhoods

Note: This figure shows the distribution of median retail distance for grocery purchases for each of the ZIP codes in our sample by income quintile of the ZIP code for February and March 2020. Each box spans the 25th to 75th percentiles of neighborhood retail distance with a notch at the median retail distance. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

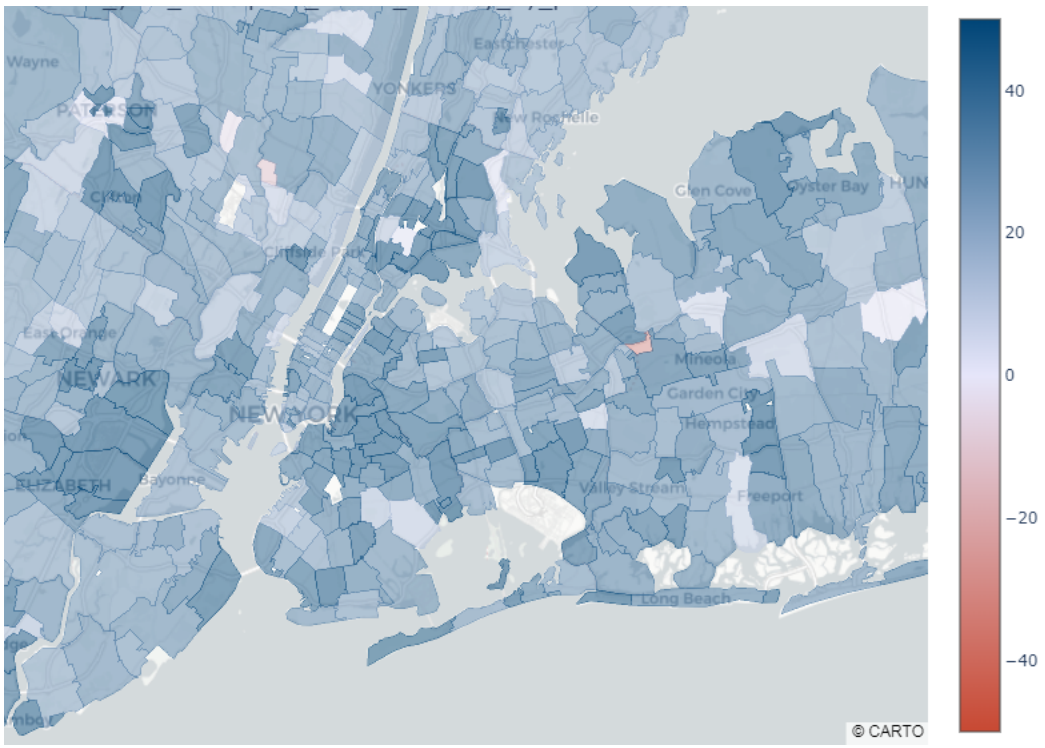
Figure 16: NYC metro area neighborhoods by median household income quintile



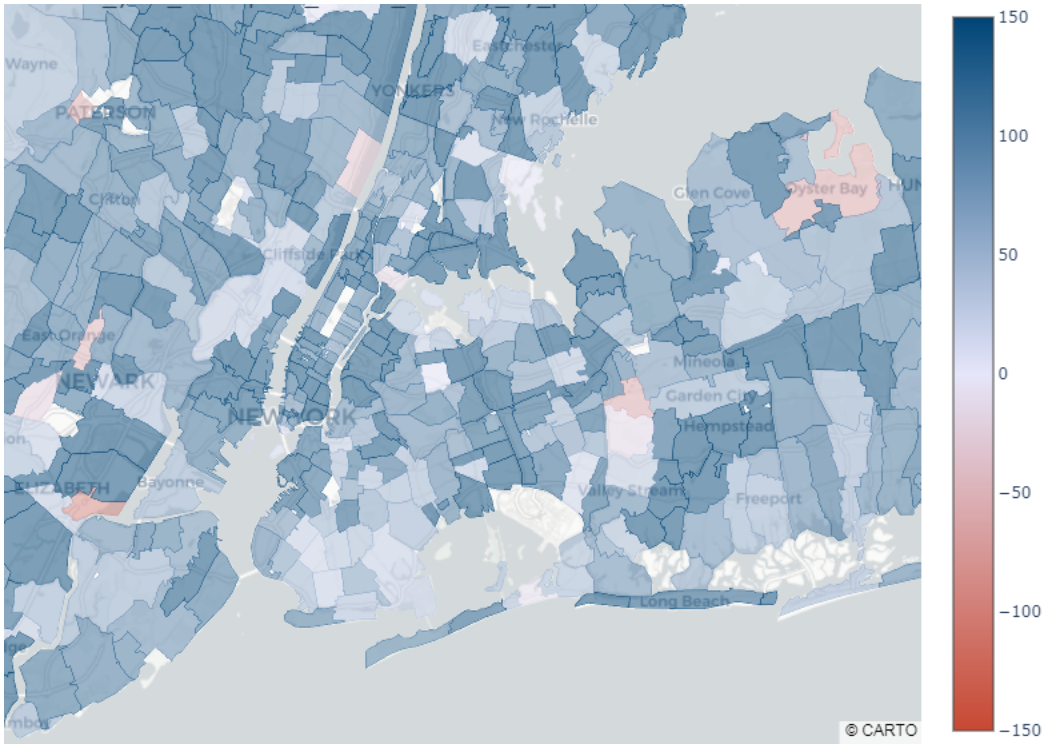
Note: This figure shows the spatial distribution of median household income by ZIP code in the New York City metropolitan area, colored by the quintile of the ZIP code. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

Figure 17: NYC metro area offline and online grocery spend shows differential growth across neighborhoods

(a) Offline

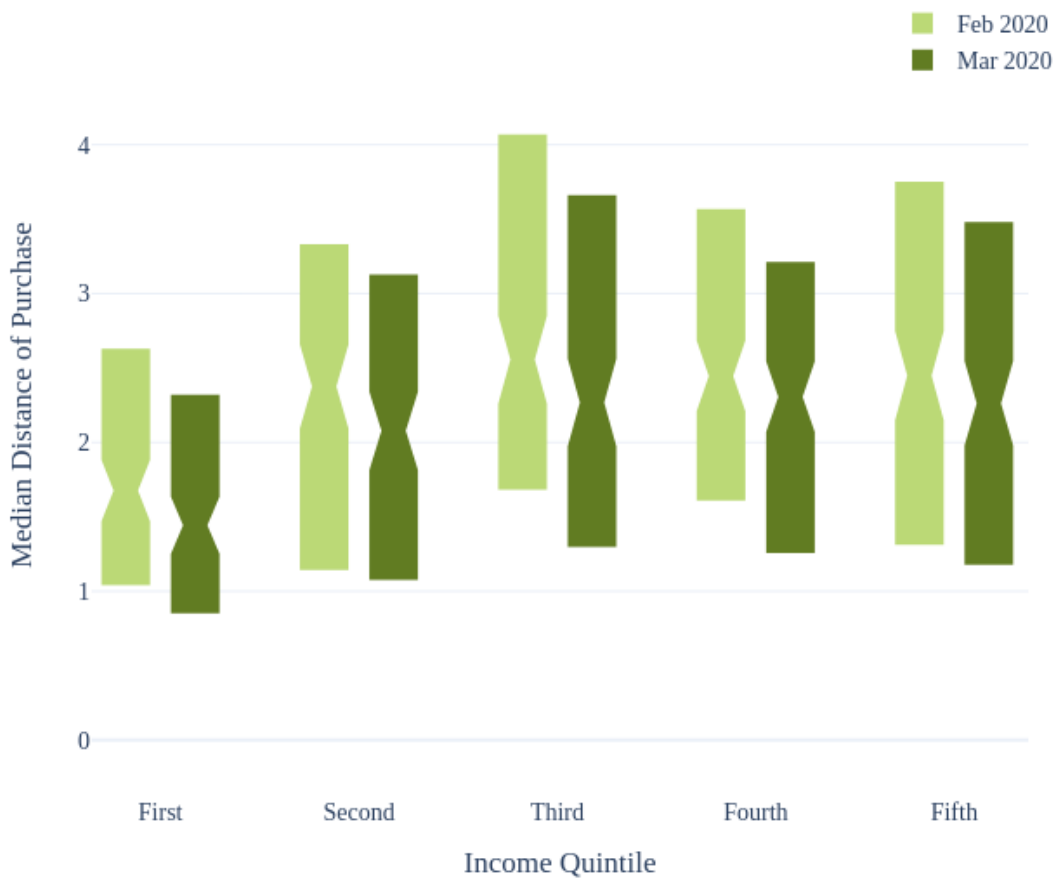


(a) Online



Note: This figure shows the spatial distribution of year-over-year changes in grocery spend, by online/offline channel and ZIP code in New York City, colored by the growth rate. A payment is considered to be online if the card was not present at the time of transaction.

Figure 18: NYC metro area grocery store median distance improved in middle income neighborhoods



Note: This figure shows the distribution of median retail distance for grocery purchases for each of the ZIP codes in New York City by income quintile of the ZIP code. Each box spans the 25th to 75th percentiles of neighborhood retail distance with a notch at the median retail distance. The income quintile is calculated within city and based on the median household income of the ZIP code as recorded in the American Community Survey 5-year data for 2014-2018.

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