How High-Income Neighborhoods Receive More Service From Municipal Government: Evidence From City Administrative Data

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Abstract

Municipal governments oversee many of the most important political matters of daily life in the U.S., yet our understanding of municipal politics remains limited. We combine a large dataset requests for local government services—such as snow plowing, traffic signal repairs, pothole repairs, and graffiti cleanup—in Boston, Massachusetts, 2011–2015, with fine-grained census data on localized incomes and income inequality. Employing a within-neighborhood design, we establish that, other things equal, higher-income census tracts make more requests for government services. Using data from open-ended text responses submitted by the city, we then connect these requests to the provision of services, showing how the underlying capacity of local communities for communicating requests—i.e., for participating in the process of local government—helps drive inequality in the receipt of services themselves. These results highlight how inequality in economic resources connects to inequality in the non-electoral components of participation in local government.
Look at our Lord’s disciples. One denied Him; one doubted Him; one betrayed Him. If our Lord couldn’t have perfection, how are you going to have it in city government?

—Richard J. Daley

1 Introduction

If political science is indeed the study of “who gets what, when, and how?” (Lasswell 1950), then the study of municipal government deserves considerable scholarly scrutiny. Many of the tangible items that people get—or don’t get—in American politics come from their localities. Municipal governments direct the police and the fire department, clear garbage, plow snow, control traffic, provide public transportation, and oversee a vast multitude of other crucial features of daily life. To accomplish these myriad tasks, municipal governments employ more workers than all state and federal governments combined (Berry, Grogger, and West 2013). Despite this fundamental role in the lives of Americans, our understanding of, and especially our empirical knowledge of, municipal politics remains dim. We know that “city politics is limited politics” (Peterson 1981), and that within these limits there exists the potential for significant inequalities stemming from differences in income within the city. But do these resource inequalities lead to political inequality? To ask a central question from Dahl (1961: 3), “How does a ‘democratic’ system work amid inequality of resources?”

In this paper, we combine a database on requests for municipal government services in Boston, Massachusetts with fine-grained census information on local incomes in order to investigate the possible links between the economic resources of localities and their experiences with local government services. We follow Dahl (1961: 3) in using this new data to answer basic questions about municipal politics, such as: “To what extent do various citizens use their political resources? Are there important differences that in turn result in differences in influence?” We find that higher-income areas devote more effort to requesting government services—such as snow plowing, pothole repairs, and traffic light repairs—and, in turn, receive more attention from local government. Our answer to these basic questions is thus somewhat different from Dahl’s. Though city politics may be more pluralistic in other ways, when it comes to the provision of basic city services, it is the

1As Bostonians who survived the snowpocalypse of 2015, the authors are only vaguely aware that some municipalities in the U.S. apparently do not require snow plowing.
wealthy who participate in the process, and gain from it, at a greater rate. The results thus shed light on the nature of non-electoral participation in local democratic politics.

Linking income to service provision is difficult due to a variety of empirical obstacles. Perhaps most obviously, the underlying needs of areas may differ, leading some to request more from the local government than others for reasons that do not directly concern economic resources. We attempt to account for this unobserved variation in two ways. First, we perform an analysis using only requests for snow plowing, since all parts of Boston are subject to snowfall, thereby holding underlying need relatively constant. Second, in all our analyses, including those on snow-plow requests and on all types of requests, we make all comparisons within-neighborhood, comparing census tracts of higher and lower income that are located within the same larger city neighborhood.

More generally, variables like income and income inequality are not “randomly” assigned, and drawing causal inferences about their links to non-electoral participation and local government services is impossible, especially because of questions of reverse causality (e.g., do the wealthy move to neighborhoods with better service provision?). The goal of our analysis is thus descriptive. We ask the basic question: other things equal, do places where the median income is higher engage more in the non-electoral aspects of local government? Do they receive more government services? The answers to these simple questions do not tell us whether making people wealthier would ensure that they receive more attention from local government, but they do show us something about the shape of local politics. That higher-income neighborhoods ask more from their local government and, in turn, receive more, tells us about who gets what in local politics.

The remainder of the paper is organized as follows. In the next section, we motivate our study by discussing the literature on local U.S. politics, linking questions in this literature to broader issues of political representation. Following that, we describe the new dataset we construct from several sources for our study’s purposes, and we explain why we focus on the city of Boston, Massachusetts. Next, we present empirical results, showing how wealthier areas of Boston request more services from the city and receive more attention. Finally, we conclude.

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2 While data on snowfall by neighborhood is not available, we have confirmed in correspondence with a local meteorologist that snowfall in fact varies, somewhat, across Boston neighborhoods. That being said, there is significant snowfall in all neighborhoods, and all of our statistical comparisons are made within-neighborhood.
2 Municipal Politics and Links to Broader Theory

The study of municipal politics has a long tradition in American politics both because of the central role the city plays in the lives of so many Americans, and also because of the general lessons about the nature of democratic society that the scrutiny of cities can reveal. As Trounstine (2010: 408) writes, reviewing the local politics literature: “Knowing how benefits are distributed and who wins and who loses in American politics requires understanding the functioning of local representative democracy.”

Perhaps no single study exemplifies this goal more than Dahl (1961), who explores local politics in New Haven, Connecticut, but, in doing so, illuminates broader themes about representative democracy. Dahl explores how political resources are distributed across New Haven society, highlighting the ways in which these resources are non-accumulating, i.e., not distributed in the same manner as economic resources. As a result, Dahl concludes that local democratic politics can be surprisingly pluralistic. Though the wealthy possess many economic resources that the less wealthy do not, popularity, participation in politics, and other sources of political power produce a complex political system in which the wealthy—at least in historical New Haven—do not hold a monopoly on all sources of influence. Our study applies Dahl’s framework to modern Boston, taking advantage of advances in data provision and empirical techniques to ask, and attempt to answer, several questions about the accumulation of political and economic resources.

Recent work similarly applies modern empirical techniques to municipal politics, but focuses mainly on the exclusively electoral links between city dwellers and their representatives. In this vein, Tausanovitch and Warshaw (2013) and especially Tausanovitch and Warshaw (2014) study the political views of city residents and their representatives, while Ferreira and Gyourko (2009) and Gerber and Hopkins (2011), relatedly, examine how Democratic and Republican mayors differ (or do not differ) in the policies they implement.\(^3\) Also in the electoral arena, Hajnal and Trounstine (2005) looks at how different groups turnout to vote in city politics, mapping this component of participation to its political consequences. Several studies also investigate disparate aspects of the non-electoral arena in municipal politics. Trounstine (N.d.), for example, studies the share of community security and education that is provided by private entities. Hajnal and Trounstine

\(^3\)Gamm and Kousser (2013) looks instead at the legislative arena, investigating state legislative bills that affect big cities.
(2010) focus on local spending, examining the role that economic constraints and political and institutional factors play in determining how cities allocate their funds. Rugh and Trounstine (2011), in a similar spirit, investigates local bond elections and the provision of public goods across cities with different characteristics. Ours is related to these latter studies in their focus on non-electoral components of the local political process. Rather than looking at macro-political factors like spending, though, we focus on basic services that local government provides.

In exploring how city residents request and receive these basic services, we speak also to a broader literature on civic engagement. Verba, Schlozman, and Brady (1995: 4), for example, reports that “Citizen activists tend to be drawn disproportionately from more advantaged groups.” One type of activist, as they explain, is a person who contacts local government with particularized requests.\footnote{For other work on contacting local officials, see also, e.g., Butler and Broockman (2011) and White, Nathan, and Faller (2014).} We study the behavior of city residents in this capacity, but we focus not only on their own behavior but also on how local government responds. Finally, our study also builds on work that documents apparent political inequalities that result from economic inequalities at the national level. Gilens (2005) and Gilens (2012), for example, present evidence that the stated preferences of wealthier individuals are systematically more correlated with policy outcomes from federal legislation. We study whether similar inequalities manifest themselves at a much more basic level—the level at which local government provides services of a daily nature to residents. In some ways these services are far less grand than the results of national policy, but, in how they touch on the daily life of every city resident, they carry their own significance.

3 New Dataset on Service Requests and Income

The analysis draws on three main datasets. Data on service requests to the Mayor’s 24-hour hotline comes directly from the city of Boston, which makes these and other datasets available at \url{https://data.cityofboston.gov/}. This dataset covers the years 2011–2015. Citizens are able to make requests via the phone, a mobile app, the city website, or in person. All requests are categorized by the city and we focus on requests for snow plowing and removal, graffiti removal, pothole repair, sidewalk repair, street light outages, tree maintenance, and traffic signal repair. For every request, we are able to observe the time and date of complaint and of resolution, as well...
Figure 1 – Income and Snow-Plow Requests Per Capita by Census Tract, Boston.

(a) Income per Capita, 2013 ACS 
(b) Snow-plow requests per capita in 2015

as the request type, the assigned department, and the source of the complaint (phone call, app, etc). Crucially for our purposes, we also observe the exact latitude and longitude location of the problem, enabling us to map complaints to census tracts and neighborhoods.

We complement the service request data with census tract demographic and economic data from the 2009-2013 American Community Survey (ACS). We also use the 2013 TIGER/Line shapefiles to map census tracts and neighborhoods in Boston. Both the ACS and shapefiles are available from NHGIS, https://www.nhgis.org/.

4 Empirical Analyses: Who Requests and Who Receives?

4.1 Higher-Income Areas Request More Services

We start with a graphical analysis to preview our findings. In Figure 1, we begin by showing the geographical dispersion of census-tract income per capita (left panel) and snow-plow requests during the incredibly snow-heavy winter of 2015. Lighter areas of the maps are those with lower levels of income or complaints relative to their neighborhoods; darker areas are those with higher levels. As the maps suggest, relative to their neighborhoods, higher-income tracts tend to make more requests.
Figure 2 – Relationship Between Income and Service Requests at the Census-Tract Level, Boston, 2011-2015. Higher-income census tracts tend to request more services from local government.

Note: Points represent averages in equal-sample-sized bins of census tract log income.

Figure 2 shows this relationship another way; it presents binned averages of log income and log total requests by census tract, covering the full time period of our data. As the plot shows, there is a noticeable, positive relationship between the per-capita income of census tracts and the number of requests inhabitants of the census tract make.

Next, and more formally, we estimate equations of the form

$$\log \text{Num Requests}_{ijst} = \beta_1 \log \text{Income}_{it} + \beta_2 GINI_{it} + \gamma_j + \delta_t + \sum_{z=2011}^{2015} 1\{Year = z\} + X_{it} \eta + \epsilon_{ijst},$$

(1)

where the outcome variable $\log \text{Num Requests}_{ijst}$ measures the logged number of service requests of type $s$ placed during month $t$ in census tract $i$ located in neighborhood $j$. The main explanatory variable of interest is $\log \text{Income}_{it}$, which measures the logged median income in census tract $i$ in month $t$. Thus, $\beta_1$ represents the main quantity of interest, the estimated association between median income and request behavior across census tracts. We control for $GINI_{it}$ which measures income inequality for census tract $i$ during month $t$, as well as for neighborhood fixed effects.
(γj), month fixed effects (δt), year fixed effects (the summation term), and an optional vector of additional control variables measured at the census tract and month level (Xit).

We estimate equation 1 first for just snow-plow requests, and then for all request types. Table 1 presents the results. The first column shows the simple results considering only snow-plow requests and including neighborhood fixed effects, month, and year fixed effects, but no additional control variables. As the first row shows, a one percent increase in median income at the census-tract level predicts roughly a half-percent increase in the number of snow-plow requests. Because of the neighborhood fixed effects, we can think of this estimate as a within-neighborhood estimate. So, for example, for two census tracts both located within the neighborhood of Back Bay, we would expect those where the median income is higher to make more snow-plow requests—even though underlying snow conditions are likely to be very similar across Back Bay.

The second row presents the estimated coefficient on GINI. Here we see that census tracts where income inequality is higher tend to submit fewer snow-plow requests. Because this estimate is quite a bit less precise than that for log income, we do not place much focus on it in this study. However, because theories usually predict this negative association, it may be worth highlighting for future research.

In the second column, we replicate the snow-plow analysis but with the addition of the following control variables: log census tract population; a set of share variables to indicate the racial composition of the tract as measured in the Census; and population density of the census tract. The addition of these controls has very little impact on the main quantity of interest, as shown in the first row of the second column.

The latter two columns replicate these same two specifications but using all request types. As we discussed previously, this alternate approach has advantages and disadvantages. By bringing in more request types, the results are obviously more general as well as more powerful from a statistical perspective. On the other hand, by including request types where the underlying need surely varies more by area—graffiti clean-up, for example, does not occur evenly across tracts even within neighborhoods—the associations we measure here may be less informative. As the first row shows, in the third and fourth columns, we continue to find a strong and positive association between census-tract income and the number of requests.
Table 1 – Association Between Income, Income Inequality, and Requests for Service at the Census Tract Level. Wealthier census tracts file more requests, both for snow removal and across all included request types.

<table>
<thead>
<tr>
<th></th>
<th>DV: Log Number of Requests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Snow Plow Requests</td>
</tr>
<tr>
<td>Log Income</td>
<td>0.49 (0.14)</td>
</tr>
<tr>
<td>GINI</td>
<td>-1.58 (0.89)</td>
</tr>
<tr>
<td># Individual Obs</td>
<td>14,429</td>
</tr>
<tr>
<td># Census Tract-Month Obs</td>
<td>854</td>
</tr>
<tr>
<td>Controls</td>
<td>No</td>
</tr>
<tr>
<td>Neighborhood Fixed Effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Yes</td>
</tr>
<tr>
<td>Month Fixed Effects</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Standard errors clustered by census tract in parentheses. When included, controls are: log population, racial composition of tract, and population density.

Figure 3 decomposes these effects by service type. The figure plots the estimated coefficient on log income at the census-tract level ($\beta_1$ from equation 1) where the equation is estimated repeatedly, restricting the sample to each type of service request in turn. As we see, there is a positive (conditional) association between census-tract median income and requests for essentially all types of requests (except traffic signal repairs). The association for snow-plow requests is the largest. This could reflect that wealthier areas are more sensitive to problems caused by winter weather, and/or it could indicate that a downward bias from unobserved factors that drive underlying need for various types of service that are negatively correlated with income. Naturally, the opposite could also be true; the estimated association for snow-plow requests could be upward biased if, say, wealthier areas have greater needs for snow plowing. We think this is less likely since snowfall affects all neighborhoods, and more importantly, all areas within a neighborhood, but we cannot rule it out completely.

4.2 Government Response to Requests

We have established that wealthier areas of Boston request more services from local government. Because (essentially) all of these requests are eventually resolved in one way or another, the very fact
that the frequency of complaints varies across income levels points to an inequality in the receipt of services, too. In this section, we follow up and investigate how long it takes local government to process requests.

There are two major pitfalls to using the service request data to evaluate the speed of response. First, the fact that a request is marked “resolved” does not mean that the city actually resolved the underlying issue. Indeed, a simple scanning of the text that city officials write when marking requests as resolved shows a variety of closure reasons other than task completion, including: (a) duplicate requests; (b) forwarding of requests to other state and federal agencies; (c) loss of relevance due to the length of time since the request (e.g., unfulfilled snow removal requests that “expire” when spring comes and the snow melts); and (d) requests marked as invalid (e.g., reports of graffiti that are in fact construction-related labels). A naive measure of the number of days from request to resolution may not be accurate as a result.

We attempt to address this issue by parsing the text that city employees write when they mark issues as resolved. We use regular expressions to code individual requests as duplicates, as invalid, and as referred. As it turns out, such observations account for only 6% of the data, suggesting that
they will not affect the analysis as much as one might worry. Accordingly, we proceed after simply dropping the problematic observations.\(^5\)

Second, a typical regression of resolution times on census-tract income would fail to incorporate the results from the previous section—namely, that higher-income areas request more services in the first place. Because of this behavior, we might expect the marginal service request in higher-income areas to be less pressing than in lower-income areas, pulling up average resolution times in places with more requests and preventing an apples-to-apples comparison.

In order to avoid this issue, we compare the entire distributions of wait times across lower and higher income areas, rather than focus on means estimated via regression. For these purposes, we define “higher income” to be census tracts where the per-capita income is at or above the 75th percentile in our full dataset, a cutoff that corresponds to roughly $51,534.15, and we define “lower income” to be census tracts where the per-capita income is at or below the 25th percentile, which corresponds to roughly $21,906.00.

Figure 4 presents the distribution of the length, in days, until requests are fulfilled for higher and lower income census tracts. In order to ease the presentation, positive outliers of over 50 days

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\(^5\) A concern with this approach is bias from selecting on post-treatment variables. Because relatively few observations have this issue, we doubt that any fancier technique to attempt to deal with this selection (e.g., a Tobit model) would change the results.
are removed.\textsuperscript{6} In addition, in order to make the comparisons valid, we first residualize the data as in our previous regressions, so that we can make within-neighborhood, within-time comparisons. As the plot shows, much more of the density for higher-income census tracts is on quick, even unusually quick, resolutions relative to lower-income tracts. Although there is a longer right tail of long wait times, most of the distribution displays a pronounced shift to the left, towards faster resolutions.

5 Conclusion

Who holds power in local politics? Taking advantage of the recent explosion in data about U.S. cities, we have investigated a particular kind of political power: the ability for citizens to request and receive services from local government. In the city of Boston, it is higher-income areas that more frequently take advantage of this option. Because we employ a within-neighborhood, within-time design, our conclusions are unlikely to be driven by unobserved differences between richer and poorer areas that might correlate with request behavior. In addition, by looking at requests for snow removal, we are further able to hold constant the underlying need for services in order to expose the propensity of different areas to make requests. We consistently find that higher-income areas take more advantage of this capability, pointing to a key area in which political and economic resources \textit{are} accumulating, contra Dahl.

Why does this inequality exist, and what could be done about it? We do not have a full answer. In the Appendix, however, we do offer evidence for one exacerbating factor. Higher-income areas are somewhat more likely than lower-income areas to use smartphones to request services, probably because smartphones are expensive and therefore more prevalent among wealthier people. The rolling out of other request channels that cater to lower-income areas might be one way to address this inequality.

More generally, lower-income areas may need further coordinating mechanisms in order to persuade individuals to file requests. A lack of trust in government may be part of what causes people in these areas to be more reticent to request services. Future work should investigate this

\textsuperscript{6}Without removing these outliers, the density plots are difficult to view because the horizontal axis has to be zoomed out so far. Nevertheless, the inclusion of these outliers does not change the overall conclusion that higher-income areas see more mass on shorter resolution times.
lack of trust and its possible links to the slower response times that local government exhibits to service requests from lower-income areas.
References


Appendix A: Additional Maps

In this section, we present a variety of Boston maps to give a sense of the demographics, population distribution, and income distribution of the city.

Figure A.1 – Share of the population by ethnic group in each census tract from the 2013 American Community Survey.

(a) White Share

(b) Black Share

(c) Hispanic Share

(d) Asian Share
Figure A.2 – Economic characteristics of census tracts from the 2013 American Community Survey.

(a) Income per Capita

(b) Gini Coefficient

Figure A.3 – Characteristics of census tracts from the 2013 American Community Survey.

(a) Population Density

(b) Population
Figure A.4 – Snowplow Requests in 2015 per 1000 Residents. Requests for snow plowing via calls to the city versus those via the smartphone app. Snow-plow requests made by phone call are more common in lower-income areas of Boston, such as Dorchester, Roxbury, and Mattapan, while those made via smartphone are more common in the higher-income parts of the city, such as Back Bay and the Downtown/Financial area.

(a) Snow-plow Requests by Phone  
(b) Snow-plow Requests by App

Higher-Income Census Tracts Use Smartphone App More

In this section, we link the source of service requests to differences in census tract income level. First, in Figure A.4, we plot the areas of the city that make requests by phone and those that make requests by (smartphone) app. As the maps show, the higher-income areas disproportionately account for smartphone app requests (right panel), while lower-income areas disproportionately account for phone requests (left panel).

Table A.1 offers formal estimates for this difference. Although we cannot always reject the null hypothesis of no difference, across all specifications we see a marked, positive association between log income and the percent of census-tract requests made via the smartphone app.
Wealthier census tracts make more use of the smartphone app for submitting requests.

<table>
<thead>
<tr>
<th>DV: Percent of Requests Submitted Via Smartphone App</th>
<th>Snow Plow Requests</th>
<th>All Requests</th>
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<tbody>
<tr>
<td>Log Income</td>
<td>3.66 (2.78)</td>
<td>1.79 (3.55)</td>
</tr>
<tr>
<td></td>
<td>3.51 (1.36)</td>
<td>0.91 (1.56)</td>
</tr>
<tr>
<td>GINI</td>
<td>-8.21 (20.11)</td>
<td>4.28 (19.18)</td>
</tr>
<tr>
<td></td>
<td>-0.16 (11.46)</td>
<td>8.08 (10.13)</td>
</tr>
<tr>
<td># Individual Obs</td>
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<td>14,429</td>
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<tr>
<td></td>
<td>28,048</td>
<td>(28,048)</td>
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<tr>
<td># Census Tract-Month Obs</td>
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<td></td>
<td>9,418</td>
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<tr>
<td>Neighborhood Fixed Effects</td>
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<td></td>
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<tr>
<td>Year Fixed Effects</td>
<td>Yes</td>
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<td></td>
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<td>Month Fixed Effects</td>
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</table>

Standard errors clustered by census tract in parentheses. When included, controls are: log population, racial composition of tract, and population density.