Levels of Inequality in Municipal Policing

Abstract

This paper analyzes levels of municipal policing, focusing on an assessment of police resources and their measurement for American municipalities. To investigate determinants of policing levels, alternative explanations are explored in an analysis of municipalities in metropolitan areas. Using data from the 2012 Census of Governments, two measures of policing levels are reported, evaluating the reliability of the findings across alternative measurements. Main findings are that unequal levels of policing are prevalent across American municipalities and that social and institutional characteristics influence those unequal levels of policing. Additional findings are that institutional characteristics differentially affect levels of policing, according to a quantile analysis of the dependent variable’s distribution. Although its primary contribution is to local public economies research, the paper also integrates social and institutional literatures to identify factors influencing the allocation of resources to policing.

Keywords: Local public economies, social heterogeneity, institutional capacity, policing services

Practitioner Points

- Development of institutional capacities can allow local governments to reduce resource disparities in policing.
- Mayors have significant political and policy capacities to shape the allocation of police resources in their communities.
- State governments can play an important role in redressing resource disparities in policing and could exercise a greater role in policing governance.
Levels of Inequality in Municipal Policing

Inequality in policing is a defining public policy challenge of our time (Ward and Menifield 2017). Recent events in Ferguson and other cities have raised the sense of urgency about policing programs of municipalities. Allegations of racial bias, service disparities, and calls for equity motivate a renewed interest in the performance of policing services in America (Charbonneau et al. 2009). Policing services vary widely across American municipalities, in terms of spending and staffing levels of those services. Those different levels of policing seem to originate partly from differences in the social context of communities. Nevertheless, levels of municipal policing vary widely even after accounting for social characteristics (Sharp 2006).

What explains inequalities in municipal policing? The significance of this research question, for theory and practice, is principally related to the role that municipalities play in the delivery of police services. By delivering policing, municipalities have a direct impact on the level and outcomes of those services. In the broader context, municipal policing is of importance because, in the federal system, policing powers are delegated to municipal governments. These governments promote public safety primarily through their policing programs; therefore, the level of resources allocated to policing is a critical mechanism through which municipalities shape outcomes of public safety.

Some municipalities provide low levels of policing; other municipalities provide high levels of policing (Census of Governments 2012). Whether to expand, maintain, or scale back those policing levels are then decisions of enduring importance for municipalities seeking to adapt themselves to social polarization. These decisions therefore are central questions for American governments and their citizens. One lesson of the civil unrest in American cities—past
and recent—is that the social environment influences the public demand for policing, yet police units respond differently to that demand.

The focal contribution of this paper is an assessment of levels of police resources, conceptualized as the size of resources allocated to policing (Coe and Weisel 2001; Sharp 2006). In support of this conceptualization, two working measurements—police expenditure and staffing—will be reported. While they represent specific dimensions of resources, police expenditure and police staffing are conceptually related. The findings, reported later, appear consistent with that relationship.

Though theoretically a public good, policing has differential impacts (Epp, Maynard-Moody, and Haider-Markel 2014). Those differential impacts stem partly from the costs and benefits of policing. On the one hand, benefits accrue to a majority of residents in the form of public safety; on the other, policing can disproportionately affect minorities (Ward 2002; Weitzer and Tuch 2006). A second purpose of the paper then is to explore factors influencing the levels of municipal policing. That exploration will begin with specific linkages between social heterogeneity and policing levels of municipalities. Although various factors influence policing and are addressed to a certain extent, the present research focuses on key sources of social polarization: race, ethnicity, and income inequality.

Policing can disproportionately affect nonwhite, Hispanic, and poor communities (Epp, Maynard-Moody, and Haider-Markel 2014). These minority communities then tend to perceive police in a rather distrustful manner and as a threat, rather than as a representation of a public good. I hypothesize accordingly that the institutional capacity of government may be a central framework mediating social polarization—and therefore that government capacities can partly resolve conflicting preferences for policing. The research will therefore evaluate whether
inequalities in policing reflect differential capacities of government to respond to social polarization.

Succeeding sections of the paper are organized as follows. The next section reviews relevant literature to define concepts of (1) social heterogeneity and (2) the institutional capacity of government. A *local public economies* perspective is employed to investigate the relationship of those factors with policing services of municipalities. The third and fourth sections respectively present the research strategy and findings. Conclusions follow in the last section.

**Related Literature**

**Social Heterogeneity**

History reveals that social heterogeneity has been a critical influence in urban policing. If heterogeneity remains influential, an analytical theory of policing needs to explain why governments bolster policing efforts as a response to social heterogeneity (Rivera and Ward 2017). Three social factors are of primary relevance: race, ethnicity, and income inequality. The first factor—race—has a long history relating to racial conflict in America (Jackson 1989). The second factor—ethnicity—is of growing controversy relating to immigration, of both legal and undocumented origin (Waldinger 1989). The third factor—income inequality—is of growing concern due to widening income inequality in America. These social factors need not be mutually exclusive and, in the urban history of the United States, ethnoracial and class inequalities are indeed correlated. Nevertheless, those factors represent distinct dimensions of social heterogeneity that deserve specific attention.

**Ethnoracial Heterogeneity**. A first hypothesis links racial and ethnic heterogeneity to policing responses (see, for references to this literature, Liska et al. 1985; Epp, Maynard-Moody, and
Haider-Markel 2014; Ward 2002). This hypothesis relates to theories of social control and urban conflict in America (Alesina et al. 1999; Jacobs and Helms 1999; Omi and Winant 2015). The present research focuses on African Americans and Hispanics, the largest ethnoracial groups linked to policing disparities in the United States.

Racial heterogeneity in cities appears to reproduce perceptions of minority threat among white-majority groups (Sharp 2006; Stults and Baumer 2007). As a response, white-majority groups theoretically have favored preventive or punitive social control policies, particularly local policing. Racial heterogeneity certainly is not the only source of urban conflict, as various social and institutional factors potentially interrelate with social unrest in cities (Cutler et al. 1999; Van Kempen and Şule Özüekren 1998; Waldinger 1989). However, racial fear appears to be a critical motivation for social control and safety policies in recent decades (Stults and Baumer 2007). According to this hypothesis, white-majority groups favor increased policing efforts, as a strategy of social control over perceived minority threats (Nicholson-Crotty et al. 2017; Sharp 2006).

A growing literature turns attention to ethnic heterogeneity (Hong 2016; Lewis and Ramakrishnan 2007). In the public debate, ethnic inequalities are sharply contrasted with arguments over the alleged role of immigrants in crime—and heated debate over policy proposals such as deportation of undocumented immigrants and making “sanctuary cities” ineligible for federal funding. In the literature, social conflict theories relate ethnic heterogeneity with policing inequalities. Nonetheless, research suggests that ethnic inequalities may be less pronounced than racial inequalities in policing practices (Epp, Maynard-Moody, and Haider-Markel 2014). Apparently, minority-threat perceptions are somewhat less severe between non-Hispanic and Hispanic groups than between white and African American groups.
Residential segregation is another mechanism that could affect minority-threat perceptions (Cutler et al. 1999). African Americans are more highly segregated than Hispanics in metropolitan areas (Massey et al. 2009). Higher segregation of African Americans can therefore exacerbate minority-threat perceptions by white-majority residents. Due to lower segregation, Hispanic presence would play a somewhat lesser role in policing levels. In other words, Hispanic-ethnic heterogeneity would increase levels of municipal policing but to a lesser extent than racial heterogeneity. The first hypothesis of social heterogeneity therefore is that ethnoracial heterogeneity raises levels of policing:

Hypothesis 1a: As white–nonwhite heterogeneity increases, the level of municipal policing will increase.

Hypothesis 1b: As Hispanic–nonHispanic heterogeneity increases, the level of municipal policing will increase.

Income Inequality. While racial polarization is a central theme, the public debate and research are turning attention to the consequences of widening income inequality in the United States (Reardon and Bischoff 2011). Those consequences naturally motivate a growing interest in theoretical explanations for socioeconomic inequalities. Socioeconomic conditions theoretically underlie demand for services (Alesina et al. 1999). Income inequality specifically is a hypothesis for the influence of socioeconomic heterogeneity on the levels of municipal policing.

Two related mechanisms can explain why the allocation of resources to policing would increase in the context of socioeconomic inequality. On the one hand, unequal municipalities could have an increased need for public safety services due to higher rates of poverty; on the other, unequal municipalities can fund higher levels of policing via increased support for policing by affluent residents and greater resources from these residents. These two mechanisms
can operate together to raise policing levels in the context of socioeconomic inequality (Liska et al. 1985).

Unequal municipalities may have greater needs for public safety, increasing demand for policing (Boustan et al. 2013). Municipal governments would deploy policing resources, partly to deal with the unintended effects of inequality, as inequality theoretically reproduces social ills. Due to concentration of poverty, unequal municipalities are more likely to be affected by the social ills of poverty. In terms of public safety, social ills can include a higher risk of crime victimization disproportionately affecting low income residents (Truman and Morgan 2016). A higher risk of crime victimization would result in increased levels of policing in unequal municipalities.

Socioeconomic inequality reproduces an inherent conflict in preferences for allocation of resources. In the context of inequality ills, demand for policing may increase by middle and high-income residents (Jacobs and Helms 1999). To prevent crime, these residents would support a greater allocation of resources to policing. As affluent residents hold higher shares of income, unequal municipalities would also be able to collect higher revenue from this group of residents. Higher revenue could then allow municipalities to expand police expenditures.

Both needs and support for policing can operate together in raising policing levels of unequal municipalities. This hypothesis links to the median voter model, a model of public choice integrating explanations for income inequality (Boustan et al. 2013). The median voter model posits, indeed, that public expenditure programs are larger in the context of socioeconomic inequality (Boustan et al. 2013). Consequently, the alternative hypothesis of social heterogeneity is that income inequality raises levels of policing:
Hypothesis 2: As income inequality increases, the level of municipal policing will increase.

**Institutional Capacity of Government**

In light of social heterogeneity, a local public economies framework will suggest the relevance of government capacities (Parks and Oakerson 2000; see also Judge, Stoker, and Wolman 1995). The local public economies framework proposes the following concepts for exploration. First, local government constitutions (structures) underpin the organization of government in metropolitan areas (Ostrom et al. 1961). Those government structures can also provide citizens with political mechanisms for enhanced matching of citizen preferences and the provision of services (Oakerson and Parks 1999). Second, metropolitan disparities can be addressed by unbundling production of services from provision of services. Third, service inequalities can be redressed through programs of intergovernmental assistance (Parks and Oakerson 2000). This section turns to an exploration of these factors and their implications for municipal policing.¹

**Municipal Incorporation.** Incorporation is the most basic mechanism enabling self-governing capacity for unincorporated communities (Rice, Waldner, and Smith 2014; Miller 1981). Over the 20th century, several states relaxed incorporation restrictions by adopting general laws for incorporation (Krane et al. 2001). After those reforms, initiatives for incorporation were no longer a discretionary power of the state legislatures that previously used special legislation to control incorporation. Subsequently, municipal incorporation became a fundamental—though often controversial—mechanism enabling the organization of government.

Institutional life after incorporation can increase policing levels in several ways. First of all, control of policing powers often motivates initiatives for municipal incorporation (Rice, Waldner, and Smith 2014). Before incorporation, policing services for unincorporated areas are
provided by other city or county governments. Nevertheless, policing by other governments diminishes influence over policing decisions by unincorporated residents. Other city or county police units, e.g., can be located at far distances from unincorporated areas, affecting the accessibility of police services. And other city and county governments will be more responsive to their constituencies. Consequently, municipal incorporation could allow for direct control of policing powers by unincorporated communities.

After incorporation, municipalities are able to take charge of general-purpose functions. New municipalities first take charge of policing powers, as these powers correspond to the functions of general-purpose governments (Briffault and Reynolds 2016). After incorporation, municipalities typically expand their police expenditure and staffing levels (Rice, Waldner, and Smith 2014). Since service provision is costly due to start-up or fixed costs, new municipalities can provide police services by building economies of scale (Boyne 1992; Leon-Moreta 2016). Over time, therefore, incorporated municipalities could enlarge police services by building upon preexisting economies of scale.

The local public economies perspective links the organization of government to the provision of services (Ostrom et al. 1961; Parks and Oakerson 2000). Incorporation is the most basic mechanism enabling organization of government for unincorporated communities. And the longevity of governments can provide earlier-incorporated governments with greater capacity to develop and extend policing services. Consequently, time of municipal incorporation is hypothesized to allow for higher levels of policing:

Hypothesis 3: As years of incorporation increase, the level of municipal policing will increase.
Form of Government. Different forms of government create different incentives in the policy process of government (Mouritzen and Svara 2002; Nelson and Svara 2010). And a different policy process will shape the policy outputs of government. Those policy outputs can be influenced by the powers granted to local officials through the form of government (Carr 2015; Feiock et al. 2016). Accordingly, the form of government can influence decisions on expansion, continuation, or retrenchment of policing services.

Municipal forms of government include (broadly speaking) the mayor-council form and the council-manager form (ICMA 2011; Mouritzen and Svara 2002); other forms include a smaller proportion of commission, town meeting, or representative town meeting governments. Those forms differentiate municipal governments by the configuration of governing powers. The mayor-council form is structured per the traditional separation of powers, whereas the council-manager form is a reformed version of unified powers. This research focuses on the mayor-council form and its implications (Gerber and Hopkins 2011; Svara 2009). (Note, however, that a strand of literature debates adapted conceptualizations on form of government. See, on that debate, Feiock et al. 2016; Frederickson, Johnson, and Wood 2004; Karuppusamy and Carr 2012; Nelson and Svara 2010).

In the literature, the mayor-council form is generally compared with the council-manager form, relating the council-manager form to innovativeness, professional management, and performance of government (Carr 2015). An alternative literature, however, reconceives the comparative capacities of mayor-council government (Feioick et al. 2016; Svara 2009). This literature emphasizes the political capacities of the mayor-council form, in which mayors can exercise significant political leadership. These leadership capacities, in contrast, may not be equally possible under the council-manager form. Although a mayor position can be present
under the council-manager form, the mayor’s formal powers are typically stronger under the
mayor-council form (Frederickson, Johnson, and Wood 2004; Mouritzen and Svara 2002).

A related capacity is the direct accountability of mayors to voters (Gerber and Hopkins
2011; Svara 2009). Due to this electoral connection, mayors may be particularly responsive to
voter preferences. Mayor-council governments would be more likely to allocate resources to
programs particularly valued by voters. Public safety can be one of the most—sometimes the
most—popular program for voters (Weitzer and Tuch 2006). If the majority of voters express
preferences for increased policing, a mayor will be theoretically responsive to those preferences.
In contrast, the relative insulation of city managers from electoral politics implies that the
council-manager form might be less responsive to voter preferences for policing. Additionally,
the council-manager form may result in a more even distribution of resources across municipal
services (Leon-Moreta 2016).

A local public economies framework links political structures to citizen preferences for
services. Mayor-council government is a form of government traditionally conceived to make
government officials directly accountable to voters. The direct accountability of mayors to voters
may thus lead to increased deployment of police resources in mayor-council municipalities. And
greater political leadership would provide mayors with influence over resource allocation,
similarly leading to increased allocation of resources to policing. Consequently, the mayor-
council form is hypothesized to allow for higher levels of policing:

Hypothesis 4: The presence of a mayor-council government will increase the level of
municipal policing.

Metropolitan Disparities. Disparities in fiscal capacity is a hypothesis relating to issues in
metropolitan governance (see, for references to this literature, Altshuler et al. 1999; Gordon
Fiscal disparities can be conceptualized as disparities in fiscal capacity between municipalities in the metropolitan area. Not only a municipality’s fiscal capacity will matter for police services; a municipality’s fiscal capacity relative to other municipalities in the metropolitan area would also matter for explaining inequalities in the provision of policing services (Bahl et al. 1992; Ladd and Yinger 1989). Metropolitan disparities stem particularly from a differential ability of governments to rely on tax revenue (Hendrick and Shi 2015). Taxing capacity is of relevance because taxes are the primary source of revenue supporting local policing. Although the choice of specific source (property or another tax source) depends on policy and socioeconomic conditions, taxes are a large proportion of revenue supporting police services in municipalities (Anderson 2014).

Fiscal disparities theoretically diminish the ability of municipalities to support police services. Wide disparities imply that a few municipalities have higher fiscal capacity, while other municipalities have lower fiscal capacity to support services. In other words, a few municipalities will be able to collect disproportionate shares of revenues, compared to the rest of municipalities in the metropolitan area. Wide disparities then have a restrictive effect on municipalities whose fiscal capacity is lower relative to other municipalities (Jimenez 2014). Disparities, from lower fiscal capacity of affected municipalities, could thus diminish the levels of municipal policing.

The local public economies framework recognizes the prevalence of metropolitan disparities in fiscal capacity. Those disparities can disproportionately affect municipalities that have a limited ability to rely on tax revenue to support policing services. Consequently, disparities in fiscal capacity are hypothesized to have a negative impact on municipal policing:
Hypothesis 5: *As metropolitan disparities increase, the level of municipal policing will decrease.*

**Interlocal Cooperation.** An alternative hypothesis involves cooperative arrangements as mechanisms for metropolitan governance. To explore those mechanisms, the local public economies framework differentiates between the provision and the production of services (Parks and Oakerson 2000). Provision of services are decisions on whether, and to what extent, services will be provided. Production of services, however, are decisions on how, and by whom, those services will be produced. In policing, therefore, provision is related to the level of resources, whereas production can be related to alternative productive mechanisms, such as interlocal cooperation. This research will focus on interlocal transfers to operationalize the levels of interlocal cooperation among governments. (Note, however, that municipalities can collaborate through a variety of fiscal and nonfiscal mechanisms. See, for references, Andrew and Hawkins 2013; LeRoux, Brandenburger, and Pandey 2010; Feiock and Scholz 2010; Zeemering 2008).

A common type of interlocal transfers are reimbursements by a municipality to other governments for the production of policing services. These reimbursements represent contractual payments, where the municipality pays another government for extending police services to the municipality’s jurisdiction. In those cases, the municipality reimburses another city or county government for the production of policing services. Municipalities rely on interlocal contracting for several reasons (Andrew and Hawkins 2013; Zeemering 2008). Generally, a larger city or county government can take advantage of scale economies in the production of services (Carr, LeRoux, and Shrestha 2009; Krueger et al. 2011; Kwon and Feiock 2010). Therefore a municipality can choose a level of policing provision, while relying on a larger government for the actual production of policing services (Parks and Oakerson 2000).
While bilateral contracting explains a large amount of interlocal transfers, multilateral regional agreements may also explain interlocal transfers (Andrew and Hawkins 2013). Through regional agreements, municipalities will operate together to produce or support policing. In some metropolitan areas, interlocal transfers are intended as revenue sharing for policing services; in other areas, interlocal transfers may be part of comprehensive organizational arrangements such as consolidation of public safety programs into metropolitan agencies (Wilson and Grammich 2012).

Alternatively, interlocal transfers may be intended to address fiscal disparities. In those cases, a municipality would transfer resources to other municipalities as for fiscal equalization. These interlocal equalization approaches are sometimes of interest, due to their potential ability to redress metropolitan disparities. The impact of those disparities may motivate the use of interlocal transfers as supplemental mechanisms to fund services. This may be encouraged by state policy, where affluent municipalities are requested to transfer revenues to poor municipalities (Bahl et al. 1992; Gordon 2012).

The local public economies perspective incorporates cooperative arrangements as alternative arrangements for the production of services. The conceptual difference between production and provision thus has implications for policing, as the production of these services can be unbundled from provision levels. This research focuses on interlocal transfers to operationalize the levels of interlocal cooperation, including contractual reimbursements and revenue sharing between governments. Interlocal transfers, by substitution for municipal policing, therefore are hypothesized to lower the direct provision of policing services:

Hypothesis 6: As the level of interlocal cooperation increases, the direct provision of municipal policing will decrease.
**Intergovernmental Assistance.** The fiscal capacity of municipalities depends not only on their own ability to raise revenue for services. Theories of fiscal federalism emphasize the role of intergovernmental aid in fiscal capacity and allocation of resources across levels of government (see, for references, Musso 1998; Oates 2011; Pagano and Hoene 2010; Peterson 1995; Stein 1990; Stein and Hamm 1987). In American federalism, a variety of grants-in-aid are employed to support municipalities’ ability to provide services. By relying on external sources of revenue, on top of own sources, municipalities can extend police services. Intergovernmental revenue expands a municipality’s fiscal capacity, even more so than own-source revenue (Deller and Maher 2006; Oates 2011).

Theories of fiscal federalism suggest that grants-in-aid can be designed to redress fiscal disparities among municipalities (Oates 2011). When municipal capacity is limited, higher levels of intergovernmental aid can sustain the provision of services (Stein and Hamm 1987). By expanding fiscal capacity and potentially redressing fiscal disparities, grants-in-aid would allow municipalities to expand policing levels. Compared with own-source revenue, intergovernmental revenue is relatively low-cost revenue (Oates 2011). Even when matching funding is required, intergovernmental revenue can still relieve the fiscal burden of services, as compared with the provision of services supported by own-source revenue only. This hypothesis is referred to as the “flypaper effect,” which predicts that intergovernmental aid will expand local expenditures (Deller and Maher 2006, p. 213).

Generally, municipalities face a trade-off in revenue and spending decisions that can affect their police services. Higher levels of intergovernmental aid allow municipalities to resolve that trade-off in favor of higher levels of policing. Grant funding thus allows for increased policing efforts, yet grants-in-aid to municipalities vary across states. Municipalities
rely substantially, though unevenly so, on intergovernmental grants. The largest amount of intergovernmental aid to municipalities is state aid, though federal aid also supports municipal services (Census of Governments 2012). Consequently, this research will emphasize the role of state aid, though recognizing that federal aid may have a similar effect on policing levels.

Intergovernmental assistance is integrated in the local public economies framework for explaining policing services of municipalities, building on principles of fiscal federalism (Parks and Oakerson 2000). Since metropolitan disparities primarily stem from disparities in revenue capacity (Rhode and Strumpf 2003), intergovernmental grants can be relevant policy instruments for reallocation of resources between levels of government (Oates 2011). Intergovernmental assistance therefore is hypothesized to influence the levels of policing:

Hypothesis 7a: *As the level of state aid increases, the level of municipal policing will increase.*

Hypothesis 7b: *As the level of federal aid increases, the level of municipal policing will increase.*

**Empirical Framework**

**Unit of Analysis and Sampling Frame**

The unit of analysis is the municipality as defined by the 2012 Census of Governments. The present research focuses on municipalities in metropolitan areas. This focus is important because, as noted in previous sections, the social/institutional environment differs for municipalities in metropolitan areas and municipalities in other (non-metropolitan) areas (Ostrom, Parks, and Whitaker 1978). The sampling frame thus includes all municipalities in metropolitan areas as defined by the US Census Bureau. The original sampling frame adds up to 8,993 municipal units; nonetheless, the final sample for analysis adds up to 7,755 municipal units, due to missing
observations from some sources of data. This section summarizes those sources; see table 1 for complete definitions and sources.

<Table 1>

**Dependent Variable**

Data on police resources are collected from the 2012 Census of Governments. The level of policing is operationalized via police expenditure per capita. To evaluate the reliability of the results, police staffing per capita is also reported. That is, the consistency of the research findings will be assessed across those alternative measurements. The two measures provide a comparative snapshot of the level of police resources across American municipalities. To fix terms, the two proposed measures will be referred to as *police expenditure* and *police staffing*. These measures are useful as they account for two specific, though conceptually related, measurements of police resources.

**Independent and Control Variables**

Data for independent and control variables are assembled from multiple sources. Data for *white-nonwhite heterogeneity*, *Hispanic-nonHispanic heterogeneity*, and *income inequality* are compiled from the American Community Survey. Data for a municipality’s *years of incorporation* are collected from the Census of Governments and the Boundary and Annexation Survey. Data for *mayor-council form* are compiled from the ICMA Form of Government Surveys and the Census of Governments. And data for *metropolitan disparities, interlocal cooperation, state aid* and *federal aid* are collected from the Census of Governments.

Control variables account for demographic characteristics underlying demand for services. Basic control variables include median income, population, population squared, fraction of population aged below 18 years, and fraction of population aged 65 and above (Alesina et al.

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1999; Jimenez 2014). Data for these variables are collected from the American Community Survey. Additional control variables are the cost of living and crime rates, factors that affect quality of life in metropolitan areas (Glaeser et al. 2015). Data for cost of living are collected from the US Bureau of Economic Analysis. And data for crime rates are collected from the US Department of Justice’s Uniform Crime Report. Again, table 1 provides complete details.

**Quantile Analysis**

A quantile analysis evaluates whether the independent variables differentially affect police resources of municipalities. In terms of police expenditure, municipalities may be broadly classified as “low,” “median,” and “high” expenditure municipalities (Anderson 2014; Miller 1981). Low-expenditure municipalities are those municipalities that allocate a limited level of police expenditure. Median-expenditure municipalities are those municipalities that allocate a typical level of police expenditure, and most American municipalities would fall in this category. High-expenditure municipalities are those municipalities that allocate substantial levels of expenditure to policing. Following a similar logic, a quantile analysis will be also reported for variables differentially affecting police staffing.

Quantile analysis thus allows us to observe municipalities on different levels of policing resources. Specifically, I employ *quantile regression*, an analytic method of growing usage in the social sciences. Quantile regression provides some advantages. First, as compared with linear regression, quantile regression is more robust to extreme observations (Hao and Naiman 2007). Second, and centrally for present purposes, quantile regression will test differential effects on quantiles of the dependent variable’s distribution.

In the baseline model, the dependent variable is modeled at the median quantile. This baseline includes the independent variables, the control variables, and a common intercept. In the
alternative models, the dependent variable’s 25th and 75th quantiles will be modeled to test for differential effects of the independent variables. The 25th quantile allows us to estimate a differential effect on low-expenditure municipalities; the 75th quantile allows us to estimate a differential effect on high-expenditure municipalities. The baseline results will be presented first for the median 50th quantile and subsequently for the 25th and 75th quantiles.

Additionally, whereas the baseline model uses a common intercept, the alternative models will add state (and District of Columbia) intercepts, intended as a test for (unobserved) state factors. For similar reasons, municipalities will be clustered into their state to estimate the statistical significance of the results (Parente and Santos Silva 2016).³

Figures 1 to 3 illustrate selected findings. Due to space consideration, the figures show findings for some independent variables that significantly influence police expenditure. Each figures plots residuals from (a) a regression of an independent variable of interest on the other independent variables (horizontal axis) and residuals from (b) a regression of the dependent variable on independent variables (vertical axis). The coefficients reported in the figures are therefore equivalent to regression coefficients. The next section provides complete results.

<Figures 1 to 3>

Findings

Main Findings

This section presents the research findings, focusing on the median 50th quantile. Table 2 presents results for (1) police expenditure and (2) police staffing. Although both variables yield similar results, I will discuss the research findings primarily in terms of police expenditure. I focus on police expenditure (for interpretation purposes) as the expenditure data more confidently allow us to draw conclusions. Whereas police expenditure data are virtually
complete, police staffing data are missing for some municipalities. In general, most of the independent variables of interest are significant. For their substantive effects, change in the dependent variable will be estimated as an independent variable changes over the sample range (Hao and Naiman 2007).

<Table 2>

First, findings are reported for conceptualizations of social heterogeneity. Consistent with Hypothesis 1a, as white-nonwhite heterogeneity increases, police expenditure increases as well. White-nonwhite heterogeneity is statistically significant at \( p > .01 \). In substantive terms, as white-nonwhite heterogeneity increases over the sample range, police expenditure increases by approximately 4 percent. Consistent with Hypothesis 1b, as Hispanic-nonHispanic heterogeneity increases, police expenditure increases as well. Hispanic-nonHispanic heterogeneity is statistically significant at \( p > .05 \). In substantive terms, as Hispanic heterogeneity increases over the sample range, police expenditure increases by approximately 1 percent. Consistent with Hypothesis 2, as income inequality increases, police expenditure increases as well. Income inequality is statistically significant at \( p < .01 \). In substantive terms, as income inequality increases over the sample range, police expenditure increases by approximately 10 percent. Overall, income inequality has the strongest effect of the social polarization factors.

Second, findings are reported for conceptualizations of structure of government. Consistent with Hypothesis 3, as years of incorporation increase, police expenditure increases as well. Years of incorporation are statistically significant at \( p > .01 \). In substantive terms, as years of incorporation increase over the sample range, police expenditure increases by approximately 6 percent. Consistent with Hypothesis 4, the presence of a mayor-council government increases
police expenditure, significantly on the second model. Overall, years of incorporation has the strongest effect of these variables related to hypotheses of institutional structure.

Third, findings are reported for factors in metropolitan governance. Consistent with Hypothesis 5, as metropolitan disparities increase, police expenditure decreases. Metropolitan disparities are statistically significant at $p > .01$. In substantive terms, as metropolitan disparities increase over the sample range, police expenditure decreases by approximately 6 percent. Consistent with Hypothesis 6, as the level of interlocal cooperation increases, police expenditure decreases. The level of interlocal cooperation is statistically significant at $p > .01$. In substantive terms, as interlocal cooperation increases over the sample range, police expenditure decreases by approximately sixty percent. Overall, interlocal cooperation has the strongest effect of these factors.

Last, findings are reported for conceptualizations of intergovernmental assistance. Consistent with Hypothesis 7a, as the amount of state aid increases, police expenditure increases as well. State aid is statistically significant at $p > .01$. In substantive terms, as the amount of state aid increases over the sample range, police expenditure increases by approximately 5 percent. Consistent with Hypothesis 7b, as the amount of federal aid increases, police expenditures increase as well. This effect, however, does not seem to be significant. Overall, state aid has the strongest effect of the intergovernmental assistance factors.

**Robustness to Alternative Models**

This section extends the analysis by reporting results of alternative models intended as a check on the baseline models. First, the alternative models add state intercepts to check for (unobserved) state-level factors. The baseline model (table 2) simply included a common intercept, and the state aid variable was assumed to account for state presence. The alternative
models no longer depend on that assumption, as these models add state-specific intercepts (table 3). Note nevertheless that adding 50 state intercepts can be a rigorous test, as those intercepts remove state-level variation and isolate cross-municipal variation.

The alternative models also extend the analysis by estimating differential effects on the dependent variable’s quantiles. Table 3 reports results of that analysis for the 25th, 50th, and 75th quantiles, estimating whether the independent variables have a differential influence on low, median, and high-expenditure municipalities. Models (3), (4) and (5) provide results for police expenditure; models (6), (7) and (8) provide results for police staffing. After these model extensions are implemented, some variables appear to have generalized effects, while other variables appear to have differential effects.

<Table 3>

The independent variables on social heterogeneity are generally significant across the alternative models. As white-nonwhite heterogeneity increases, police expenditure consistently increases across models. White-nonwhite heterogeneity thus appears to have a general effect on police expenditure, on every level and both measures of police resources. Hispanic-nonHispanic heterogeneity seems to have a differential influence on the dependent variable’s 75th quantile. In contrast, income inequality is significant across models and substantively influential on higher quantiles of police expenditure and staffing. Taken together, the alternative models lend additional support to hypotheses of social polarization.

The independent variables on institutional capacity have different effects on different models. Years of incorporation is consistently significant, except for the last model. Years of incorporation thus allows for increased police levels, particularly from low to median levels of policing. A mayor-council government is significant on both police variables’ median quantile
and staffing’s 75th quantile. Metropolitan disparities have significantly negative effects on police expenditure. Interlocal cooperation is consistently significant on both police expenditure and staffing. State aid is consistently a significant factor as well, except on the sixth model. Federal aid, however, does not seem to be significant.

Table 4 reports state intercepts for the median-quantile models (4) and (7). The District of Columbia (DC) is the reference case (for comparison purposes). On average, DC has the highest level of municipal expenditure (and staffing) in the nation (Census of Governments 2012). The negative intercepts thus show that, compared to DC, municipal expenditure per capita is (on average) lower in the states. Table 4 reports state intercepts from highest to lowest: following DC, Alaska municipalities have the highest police expenditure, whereas Indiana municipalities have the lowest police expenditure. Note finally that the state intercepts are jointly significant, as indicated by the $F$-tests from models (3) to (8).

<Table 4>

**Discussion and Conclusions**

This paper reports findings from an analysis of police resources of municipalities, focusing on metropolitan areas. The primary contribution of the research is an assessment of police resources, operationalized by two measures of police resources. Whereas prior research shows that police resources are crucial in impacts of policing, the present research documents that deep inequalities are prevalent in the levels of police resources. Those levels of inequality are themselves outcomes of substantive importance that need to be explained. Municipalities continually adjust their levels of police resources. The central finding of this research is that wide differentials are prevalent in municipal policing.
A second purpose of the research is an exploratory analysis of factors influencing levels of police resources across municipalities. I employ a local public economies perspective to investigate social and institutional explanations. At a deeper level, social explanations are unbundled into sources of social heterogeneity, and institutional explanations are unbundled into sources of government capacity. The research suggests that capacity of government shapes municipal governments’ ability to respond and potentially resolve demands for policing. I conclude therefore that institutional capacity—inclusive of longevity, form of government, intergovernmental cooperation and assistance—is a central framework for the allocation of police resources by municipalities.

Some practical implications are suggested from the research. The research finds that the policing programs of municipal governments are shaped by social heterogeneity and the institutional capacity of government. One implication therefore is that those social and institutional mechanisms should be part of policy analysis, if the intent of policy or administrative practice is to reshape policing programs of municipalities. If an equitable exercise of policing powers is intended, an effective approach would possibly involve the development of institutional capacity. If equality in policing services is to be pursued, then building institutional capacity of governments should be one area of focus for decision makers. Institutional capacity of government may partly resolve conflicting preferences for policing. For instance, coordination of policing efforts of municipalities may help attain greater equality in policing in metropolitan America.

While emphasizing local factors of influence, the present research also notes the role of intergovernmental factors, such as the role of the state government. This implication relates to the capacity of government in the context of state policies. State governments make a difference
by means of fiscal assistance to municipalities, yet state governments could also make a
difference through mechanisms such as oversight of municipal policing (Anderson 2013;
Briffault and Reynolds 2016). As state policies regulate the policing powers of municipalities,
reforming policing may imply a reassessment of state policies delegating those powers to
municipalities. If this implication is correct, the role of the states should take center stage in the
public debate on policing inequalities.

Several areas are still open for research. First, the role of the states is an important area to
investigate. Ideally, specific state frameworks should be theoretically specified and empirically
evaluated. Admittedly, data for relevant frameworks, e.g., states’ systems of criminal justice, are
presently a limitation. Second, social heterogeneity may be examined in more depth due to their
persistent relationship with policing inequalities. Finally, trust in municipal government may be
investigated, relating to the public support for allocation of resources to policing (Sharp 2012).
Work on these areas will broaden knowledge around levels of inequality in municipal policing.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition and Sources</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Police expenditure</td>
<td>Direct police expenditure, such as payments for police personnel and supplies. The municipal expenditure (in US dollars) is weighted to per-capita levels and transformed into its natural log. <em>Source:</em> Census of Governments 2012.</td>
<td>3.992 (2.255)</td>
</tr>
<tr>
<td>Police staffing</td>
<td>Number of full-time and (full-time equivalent) part-time officers. Full-time equivalence is calculated as the number of full-time officers that could be employed if full-time officers worked the hours worked by part-time officers. The municipal staffing is weighted to per-capita levels and transformed into its natural log. <em>Source:</em> Census of Governments 2012.</td>
<td>4.672 (1.972)</td>
</tr>
<tr>
<td><strong>Social heterogeneity:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-nonwhite heterogeneity</td>
<td>Probability that two residents, when randomly sampled from the municipality population, will belong to different racial groups. More formally, <em>probability</em> = 1 − ∑, R². In the formula, R is the fraction of the municipality population that belongs to racial group r. <em>Source:</em> American Community Survey 2011.</td>
<td>0.209 (0.172)</td>
</tr>
<tr>
<td>Hispanic-nonHispanic heterogeneity</td>
<td>Probability that two residents, when randomly sampled from the municipality population, will belong to different ethnic origins. More formally, <em>probability</em> = 1 − ∑, E². In the formula, E is the fraction of the municipality population that belongs to ethnic group e. <em>Source:</em> American Community Survey 2011.</td>
<td>0.116 (0.134)</td>
</tr>
<tr>
<td>Income inequality</td>
<td>Gini index of inequality in household income distribution in a municipality, as estimated and reported by the US Census Bureau. <em>Source:</em> American Community Survey 2011.</td>
<td>0.402 (0.066)</td>
</tr>
<tr>
<td><strong>Institutional capacity of government:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of incorporation</td>
<td>Years from municipal incorporation to the present. It equals 2012 minus the year of incorporation; the result is transformed into its natural log. <em>Sources:</em> Census of Governments 1987; and US Census Bureau’s Boundary and Annexation Surveys 1988 to 2011.</td>
<td>4.518 (0.551)</td>
</tr>
<tr>
<td>Mayor-council form</td>
<td>Dummy variable for mayor-council municipalities, classified by the score of 1 for these municipalities and zero otherwise. To extend the sample of valid observations, data are pooled as follows. First, data are compiled from the 2011 ICMA Form of Government Survey. Subsequently, if any data are missing from the most recent source, the next preceding ICMA Form of Government Survey is used. Finally, data not collected by the ICMA (such as municipalities with a population under 2,500) are compiled from the 1992 Census of Governments—the last Census that reported data on forms of government. <em>Sources:</em> Census of Governments 1992; and ICMA Form of Government Surveys 1996 to 2011 (City Longitudinal Government Structure database constructed by the FSU Local Governance Research Laboratory).</td>
<td>0.690 (0.462)</td>
</tr>
<tr>
<td>Metropolitan disparities</td>
<td>Fiscal disparities between municipalities, calculated as the coefficient of variation in per-capita municipal revenue. More formally, ( \text{coefficient} = \left( \frac{\sqrt{\sum_m P_m (T_m - \overline{T})^2}}{\overline{T}} \right) ). In the formula, ( T_m ) is the natural log of per-capita tax revenue for a municipality ( m ). ( \overline{T} ) is the average per-capita tax revenue of municipalities for the metropolitan area. ( P_m ) is a municipality population as a fraction of the metropolitan area population. Every municipality is weighted by its ( P_m ) fraction so that a municipality adds to the coefficient of variation based on its relative population. This weighting allows for comparability of coefficients of variation across metropolitan areas. A low coefficient indicates low disparities; a high coefficient indicates high disparities between municipalities in the metropolitan area. See Rhode and Strumpf (2003) for additional discussion regarding this coefficient. Source: Census of Governments 2012.</td>
<td>3.848 (0.707)</td>
</tr>
<tr>
<td>Interlocal cooperation</td>
<td>Transfers from the municipality to other local governments as contractual reimbursements for the production of police services or as for revenue sharing. The municipal transfers (in US dollars) are weighted to per-capita levels and transformed into their natural log. Source: Census of Governments 2012.</td>
<td>8.447 (2.131)</td>
</tr>
<tr>
<td>State aid</td>
<td>General transfers from the state government as a percentage of the municipality’s total revenues. Source: Census of Governments 2012.</td>
<td>11.533 (2.342)</td>
</tr>
<tr>
<td>Federal aid</td>
<td>General transfers from the federal government as a percentage of the municipality’s total revenues. Source: Census of Governments 2012.</td>
<td>8.312 (1.926)</td>
</tr>
<tr>
<td><strong>Controls:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>Municipality population, transformed into its natural log. Source: American Community Survey 2011.</td>
<td>7.973 (1.855)</td>
</tr>
<tr>
<td>Population squared</td>
<td>Square of the preceding variable.</td>
<td>67.025 (30.531)</td>
</tr>
<tr>
<td>Aged below 18</td>
<td>Fraction of the municipality population aged below 18 years. Source: American Community Survey 2011.</td>
<td>0.242 (0.066)</td>
</tr>
<tr>
<td>Aged 65 and above</td>
<td>Fraction of the municipality population aged 65 years and above. Source: American Community Survey 2011.</td>
<td>0.148 (0.072)</td>
</tr>
<tr>
<td>Median income</td>
<td>Median household income in a municipality, transformed into its natural log. Source: American Community Survey 2011.</td>
<td>10.832 (0.413)</td>
</tr>
<tr>
<td>Cost of living</td>
<td>Index of price parity for the metropolitan area, ranked to the average price of goods and services of US metropolitan areas. Source: Bureau of Economic Analysis 2011.</td>
<td>96.730 (9.168)</td>
</tr>
<tr>
<td>Property crime</td>
<td>Number of property crimes in the metropolitan area, weighted to a 1,000 population. Property crimes include burglary, larceny, and motor vehicle theft. Source: Uniform Crime Report 2010.</td>
<td>30.587 (8.681)</td>
</tr>
<tr>
<td>Violent crime</td>
<td>Number of violent crimes in the metropolitan area, weighted to a 1,000 population. Violent crimes include murder, rape, robbery, and aggravated assault. Source: Uniform Crime Report 2010.</td>
<td>39.771 (16.955)</td>
</tr>
</tbody>
</table>
State intercepts: Fifty dummy variables classifying observations into every state: thus Alabama municipalities take the score of 1 and zero otherwise, Alaska municipalities take the score of 1 and zero otherwise, and so forth.

Note: The table presents definitions, sources, and summary statistics. For police resources, the data source is the Census of Governments 2012. For institutional variables, data sources include the Census of Governments 1987 to 2012, the US Census Bureau's Boundary and Annexation Surveys 1988 to 2011, and the ICMA Form of Government Surveys 1996 to 2011. For social variables, data sources include the American Community Survey five-year estimates 2011, the US Department of Justice's Uniform Crime Report 2010, and the US Bureau of Economic Analysis 2011. Unless noted otherwise, the unit of observation is the municipality.
Figure 1. Population and Police Expenditure

Note: The figure plots the relationship between population and police expenditure, controlling for other independent and control variables. Dashed horizontal and vertical lines demarcate quadrants for below-mean and above-mean scores. The municipality name appears in light blue.
Figure 2. Income Inequality and Police Expenditure

Note: The figure plots the relationship between income inequality and police expenditure, controlling for other independent and control variables. Dashed horizontal and vertical lines demarcate quadrants for below-mean and above-mean scores. The municipality name appears in light blue.
**Figure 3.** Years of Incorporation and Police Expenditure

*Note:* The figure plots the relationship between years of incorporation and police expenditure, controlling for other independent and control variables. Dashed horizontal and vertical lines demarcate quadrants for below-mean and above-mean scores. The municipality name appears in light blue.
Table 2. What Factors Influence the Level of Policing?

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Police expenditure</th>
<th>Police staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantile: 50th</td>
<td>Model (1)</td>
<td>Model (2)</td>
</tr>
<tr>
<td>Level of expenditure/staffing: Median</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-nonwhite heterogeneity</td>
<td>0.768*** (0.149)</td>
<td>0.807*** (0.100)</td>
</tr>
<tr>
<td>Hispanic-nonhispanic heterogeneity</td>
<td>0.300* (0.177)</td>
<td>0.084 (0.117)</td>
</tr>
<tr>
<td>Income inequality</td>
<td>1.856*** (0.552)</td>
<td>2.291*** (0.217)</td>
</tr>
<tr>
<td>Years of incorporation</td>
<td>0.221*** (0.036)</td>
<td>0.072*** (0.027)</td>
</tr>
<tr>
<td>Mayor-council form</td>
<td>0.054 (0.039)</td>
<td>0.095*** (0.035)</td>
</tr>
<tr>
<td>Metropolitan disparities</td>
<td>-0.971*** (0.254)</td>
<td>0.086 (0.250)</td>
</tr>
<tr>
<td>Interlocal cooperation</td>
<td>-0.455*** (0.045)</td>
<td>-0.047*** (0.008)</td>
</tr>
<tr>
<td>State aid</td>
<td>0.038*** (0.008)</td>
<td>0.020** (0.010)</td>
</tr>
<tr>
<td>Federal aid</td>
<td>0.010 (0.008)</td>
<td>0.018 (0.011)</td>
</tr>
<tr>
<td>Population</td>
<td>2.824*** (0.189)</td>
<td>1.028*** (0.371)</td>
</tr>
<tr>
<td>Population squared</td>
<td>-0.165*** (0.010)</td>
<td>-0.061*** (0.020)</td>
</tr>
<tr>
<td>Aged under 18</td>
<td>-1.168** (0.527)</td>
<td>-0.703** (0.309)</td>
</tr>
<tr>
<td>Aged 65 and over</td>
<td>1.898*** (0.554)</td>
<td>0.889*** (0.327)</td>
</tr>
<tr>
<td>Median income</td>
<td>0.192** (0.087)</td>
<td>0.020 (0.055)</td>
</tr>
<tr>
<td>Cost of living</td>
<td>0.005* (0.003)</td>
<td>-0.001 (0.004)</td>
</tr>
<tr>
<td>Property crime</td>
<td>0.008*** (0.003)</td>
<td>0.007** (0.003)</td>
</tr>
<tr>
<td>Violent crime</td>
<td>0.003** (0.001)</td>
<td>0.001 (0.001)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-8.726*** (0.001)</td>
<td>-0.798 (0.001)</td>
</tr>
<tr>
<td>N</td>
<td>7,755</td>
<td>6,132</td>
</tr>
</tbody>
</table>

Note: The table reports results from quantile regressions on the dependent variable's median quantile. Standard errors clustered by state are reported in parenthesis.

***p < .01; **p < .05; and *p < .10
### Table 3. Robustness to Alternative Models

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Police expenditure</th>
<th>Police staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantile:</td>
<td>25th</td>
<td>50th</td>
</tr>
<tr>
<td>Level of expenditure/staffing:</td>
<td>Low</td>
<td>Median</td>
</tr>
<tr>
<td>Model:</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td><strong>Social heterogeneity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-nonwhite heterogeneity</td>
<td>0.517***</td>
<td>0.495***</td>
</tr>
<tr>
<td></td>
<td>(0.174)</td>
<td>(0.170)</td>
</tr>
<tr>
<td>Hispanic-nonhispanic heterogeneity</td>
<td>0.333</td>
<td>0.486**</td>
</tr>
<tr>
<td></td>
<td>(0.252)</td>
<td>(0.233)</td>
</tr>
<tr>
<td>Income inequality</td>
<td>0.939*</td>
<td>2.041***</td>
</tr>
<tr>
<td></td>
<td>(0.499)</td>
<td>(0.638)</td>
</tr>
<tr>
<td><strong>Institutional capacity of government</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of incorporation</td>
<td><strong>0.380</strong>*</td>
<td>0.245***</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>Mayor-council form</td>
<td>-0.070</td>
<td>0.089**</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.041)</td>
</tr>
<tr>
<td>Metropolitan disparities</td>
<td>-1.332***</td>
<td>-0.808***</td>
</tr>
<tr>
<td></td>
<td>(0.484)</td>
<td>(0.297)</td>
</tr>
<tr>
<td>Interlocal cooperation</td>
<td>-0.610***</td>
<td>-0.464***</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.054)</td>
</tr>
<tr>
<td>State aid</td>
<td>0.047***</td>
<td>0.041***</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Federal aid</td>
<td>0.004</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Controls: F-test</td>
<td>48.8***</td>
<td>71.4***</td>
</tr>
<tr>
<td>State intercepts: F-test</td>
<td>2e+4***</td>
<td>2e+5***</td>
</tr>
<tr>
<td>N</td>
<td>7,755</td>
<td>7,755</td>
</tr>
</tbody>
</table>

Note: The table reports partial effects from quantile regressions on the 25th, 50th and 75th quantiles. Standard errors clustered by state are reported in parenthesis. Fifty state (and District of Columbia) intercepts are included in the models. F statistics are reported for the joint significance of control variables and state intercepts. Bolded results illustrate differential effects.

***p < .01; **p < .05; and *p < .10
<table>
<thead>
<tr>
<th>State</th>
<th>Police Expenditure</th>
<th>Police Staffing</th>
<th>State</th>
<th>Police Expenditure</th>
<th>Police Staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td>District of Columbia</td>
<td>-1.881</td>
<td>-1.554</td>
<td>Michigan</td>
<td>-1.881</td>
<td>-1.554</td>
</tr>
<tr>
<td>Alaska</td>
<td>-0.767</td>
<td>-1.389</td>
<td>Washington</td>
<td>-1.884</td>
<td>-1.696</td>
</tr>
<tr>
<td>Louisiana</td>
<td>-1.411</td>
<td>-1.177</td>
<td>Texas</td>
<td>-1.888</td>
<td>-1.378</td>
</tr>
<tr>
<td>South Dakota</td>
<td>-1.495</td>
<td>-1.503</td>
<td>Illinois</td>
<td>-1.929</td>
<td>-1.548</td>
</tr>
<tr>
<td>Missouri</td>
<td>-1.511</td>
<td>-1.227</td>
<td>Tennessee</td>
<td>-1.937</td>
<td>-1.305</td>
</tr>
<tr>
<td>Colorado</td>
<td>-1.520</td>
<td>-1.233</td>
<td>Pennsylvania</td>
<td>-1.941</td>
<td>-1.631</td>
</tr>
<tr>
<td>Alabama</td>
<td>-1.598</td>
<td>-1.265</td>
<td>California</td>
<td>-1.958</td>
<td>-1.928</td>
</tr>
<tr>
<td>Georgia</td>
<td>-1.609</td>
<td>-1.148</td>
<td>Florida</td>
<td>-1.964</td>
<td>-1.387</td>
</tr>
<tr>
<td>West Virginia</td>
<td>-1.625</td>
<td>-1.268</td>
<td>Oregon</td>
<td>-1.968</td>
<td>-1.714</td>
</tr>
<tr>
<td>Virginia</td>
<td>-1.708</td>
<td>-1.269</td>
<td>Minnesota</td>
<td>-1.974</td>
<td>-1.709</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>-1.712</td>
<td>-1.495</td>
<td>Utah</td>
<td>-2.039</td>
<td>-1.747</td>
</tr>
<tr>
<td>Delaware</td>
<td>-1.720</td>
<td>-1.628</td>
<td>Wyoming</td>
<td>-2.083</td>
<td>-0.934</td>
</tr>
<tr>
<td>Ohio</td>
<td>-1.721</td>
<td>-1.433</td>
<td>Nebraska</td>
<td>-2.099</td>
<td>-1.629</td>
</tr>
<tr>
<td>New Mexico</td>
<td>-1.735</td>
<td>-1.509</td>
<td>New Jersey</td>
<td>-2.124</td>
<td>-1.443</td>
</tr>
<tr>
<td>North Carolina</td>
<td>-1.740</td>
<td>-1.175</td>
<td>Idaho</td>
<td>-2.125</td>
<td>-1.599</td>
</tr>
<tr>
<td>Montana</td>
<td>-1.743</td>
<td>-1.557</td>
<td>Kentucky</td>
<td>-2.132</td>
<td>-1.500</td>
</tr>
<tr>
<td>Arizona</td>
<td>-1.748</td>
<td>-1.494</td>
<td>Iowa</td>
<td>-2.133</td>
<td>-1.791</td>
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<tr>
<td>Mississippi</td>
<td>-1.759</td>
<td>-1.180</td>
<td>New Hampshire</td>
<td>-2.228</td>
<td>-1.442</td>
</tr>
<tr>
<td>Kansas</td>
<td>-1.762</td>
<td>-1.334</td>
<td>North Dakota</td>
<td>-2.261</td>
<td>-5.501</td>
</tr>
<tr>
<td>Arkansas</td>
<td>-1.774</td>
<td>-1.403</td>
<td>Maryland</td>
<td>-2.309</td>
<td>-1.456</td>
</tr>
<tr>
<td>Nevada</td>
<td>-1.795</td>
<td>-1.691</td>
<td>Connecticut</td>
<td>-2.328</td>
<td>-1.406</td>
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<tr>
<td>Oklahoma</td>
<td>-1.804</td>
<td>-1.475</td>
<td>Maine</td>
<td>-2.355</td>
<td>-1.415</td>
</tr>
<tr>
<td>Vermont</td>
<td>-1.819</td>
<td>-1.291</td>
<td>New York</td>
<td>-2.445</td>
<td>-1.511</td>
</tr>
<tr>
<td>South Carolina</td>
<td>-1.859</td>
<td>-1.272</td>
<td>Massachusetts</td>
<td>-2.713</td>
<td>-1.464</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>-1.869</td>
<td>-1.329</td>
<td>Indiana</td>
<td>-2.829</td>
<td>-1.431</td>
</tr>
</tbody>
</table>

Note: The table reports coefficients of state intercepts. The intercepts are ranked from highest (Alaska) to lowest (Indiana) average municipal expenditure per capita. Jointly tested, the state intercepts are significant at p < .01.
References


Judge, David, Gerry Stoker, and Harold Wolman. 1995. *Theories of Urban Politics*. Thousand...


Notes

1 The local public economies framework is related to the institutional analysis and development framework (Ostrom 2005). The local public economies framework, however, is specifically proposed for the study of urban services (Oakerson and Parks 2011).

2 Some observations are missing for data on mayor-council government. To extend the sample of valid observations, data for that variable are pooled from the ICMA Form of Government Surveys and the Census of Governments. See table 1 for details.

3 Allowing for state intercepts is useful for several reasons. Although state aid account for state presence, to a certain extent, other state factors could plausibly affect the levels of municipal policing. More formally, consider a general quantile model:

$$\text{Quantile}(F_m = 0.50) = (\text{intercept})_s + \sum_i \beta_i (\text{independent})_m + \sum_c \beta_c (\text{control})_m + \epsilon_m$$

Quantile($F_m = 0.50$) represents the dependent variable, modeled at the median quantile. It suggests that different quantiles of the dependent variable’s distribution can also be modeled. As noted, the median 50th is the baseline quantile in the analysis, and the 25th and 75th quantiles are quantiles that approximate low and high-expenditure municipalities. The terms (independent)$_m$ and (control)$_m$ encapsulate independent and control variables. The $\beta$ coefficients correspond to effects of the independent and control variables. Note that, whereas the baseline model has a common intercept, alternative models add state. The term (intercept)$_s$ represents those intercepts, intended as a test for (unobserved) state factors.

4 The 2012 Census of Governments reports that the response rate for local government employment was 82.2 percent.