# THE SUCCESS OF THE EMBEDDED STATE IN ENGLAND*

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**Abstract**

Many states exhibit high degrees of capacity without having the fiscal resources necessary to fund a modern bureaucracy. In this paper, we argue that they achieve this by exploiting the social structure of the societies they govern. We develop the concept of the "Embedded State" and illustrate how it functions using a unique survey of British urban government from 1835. Since local authorities had few resources, only a quarter of their functionaries were paid. Instead, people were motivated by prestige and career concerns. We show that jobs where these incentives dominated attracted elites and people with higher ability. We also show that, as a consequence, unpaid officials were significantly more productive than paid ones. While the Embedded State was successful in providing public goods at low monetary costs, it also featured corruption and nepotism and could not motivate unpaid bureaucrats to implement onerous tasks.

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# 1 Introduction

Across the social sciences, successful governments are thought to be 'Weberian,' stemming from Max Weber's characterization of the emergence of the modern state (Weber, 1922). This state featured 'rational-legal' administration, central features being meritocratic recruitment and the promotion of salaried and well-trained civil servants who implement policy impartially. A rich body of empirical work suggests that this model is more successful than its alternatives at providing public goods, ranging from cross-country comparisons such as Evans and Rauch (1999), to natural experiments (Acemoglu et al., 2015; Dell et al., 2018), and randomized controlled trials implementing Weberian incentives (e.g. Khan et al. (2016, 2019)), surveyed in Besley et al. (2022)).

But since Weberian governments rely on a paid professional work force, they are expensive. Partially as a consequence, most governments historically were *not* Weberian. Except in the Netherlands, tax revenues as a percentage of national income in European countries were less than 15% until the second half of the nineteenth century. As the Industrial Revolution began, tax revenues in England were around 10% of national income (O'Brien, 2011). In Prussia, the number was 5% (Spoerer, 2010). These numbers are comparable to many failed, and non-Weberian, states today, such as Haiti, Yemen, and the Central African Republic. Yet for example England was able to govern its many cities and villages extensively, providing order, protecting property rights, building infrastructure, and supplying a variety of public services. How?

In this paper, we study the hypothesis that such states employ a large corps of *unpaid* bureaucrats. These individuals are not simply community members volunteering, but hold recognized positions, and execute tasks that we would ordinarily expect to be executed by formally employed, and remunerated, bureaucrats. Such unpaid bureaucrats are incentivized and motivated to work for the state in non-monetary ways (Goldie, 2001). This is because the state is *embedded* in society, and people will exert effort if by doing so they acquire status, the activity is prestigious, or offers opportunities for subsequent career advancement. Alternatively, people may feel a duty to undertake certain activities or exert uncompensated effort because of reciprocity within a community. We claim that a state that extends into society this way and harnesses such instruments, which we call an "Embedded State," can be a successful substitute for Weberian government, and may therefore be well-positioned to explain the large variation in public good provision between places that are all equally non-Weberian.

Studying the functioning and incentives of unpaid bureaucrats is challenging for three main reasons. It requires variation in state organization across comparable units, detailed records on administrative structure, and systematic measures of institutional performance — data that are seldom available.

This paper studies local governments in historical England. Our setting is well-suited to explore hypotheses on the Embedded State. English government was divided into the (paid) bureaucracy operating from London, and a large number of local jurisdictions in its counties (provinces), boroughs (towns), and parishes (villages). These local units operated largely independently, as heterogeneous and semi-autonomous "republics" (Collinson, 1994; Goldie, 2001), providing variation across comparable units. As a first contribution, we measure the size of the local bureaucracy — England's parishes, boroughs, and counties — and compare it to the central state, largely concentrated in London. We find that the central state employed about 5,000 individuals in 1700, whereas the local state comprised over 80,000 recognized officers. This disparity was comparably substantial in 1835.[1] In addition, a sharp contrast appears in the 'Weberianness' of the local and central state, measured by the prevalence of paid positions. In London, virtually all officers received a salary.[2] At the local level, by contrast, only about 5% of officials were salaried, while the vast majority engaged in public service alongside ordinary occupations or estate management. While similar characterizations of local government have been proposed for other European countries (Ashley, 1906), the key advantage of the English setting is that for one level of local government, the boroughs, a unique survey of *all* bureaucrats is available: The Municipal Corporations report (Municipal Corporations Commissioners, 1835).[3] For 258 boroughs, this report provides data on administrative structure and institutional performance. We measure the paid status, incentive structure, job title, and job responsibilities for all officers, of whom 75% served without pay. In addition, the report records the provision of seven key public goods: policing, prisons, courts and judicial services, infrastructure construction and maintenance, clerical administration, and the general management of borough affairs.

We start by studying the performance difference between unpaid and paid officers, by comparing the quality of the provision of public goods provided by unpaid officers to that of paid officers. Since performance varies between public goods, and not between officers, our empirical setting is a standard team production setting with unobserved officer-level inputs (Bonhomme, 2025). Through the assignment of officers to the provision of individual public goods, we relate officer-level paid status to performance on a particular task (e.g. the provision of order).

We first compare performance between unpaid and paid officers, conditional on borough fixed effects, task fixed effects, and officer title (e.g. mayor) fixed effects , and several covariates that account for task complexity, and differences in task assignment for similar *jobs* (e.g. the mayor of Newcastle may be involved with a different task set than the mayor of Leeds). We find that, on average, unpaid officers are associated with a 13 percentage point increase in performance in public good provision. This is an

[1] This exercise follows Goldie (2001) and can be found in Appendix Section A.
[2] This reflects the "Tudor revolution in government" (Elton, 1953) and subsequent reforms (Brewer, 1989).
[3] See Finlayson (1963, 1966); Moret (2015).

increase of 21 percent over the sample mean. We then develop a simple structural model of team production, following Abowd et al. (1999) and Bonhomme (2025). This model clarifies which specifications and covariates can account for within-team and across-team spillovers, as well as for diminishing returns to team size. When we re-estimate the model either accounting for team-size returns, or aggregated to the team or borough level, we find a similar qualitative result: Unpaid officers perform better, teams with a higher share of unpaid officers perform better, and boroughs with a higher share of unpaid officers perform better as well. We implement a standard AKM decomposition exercise and find that this increase in performance is in part driven by the fact that unpaid officers are higher ability (Abowd et al., 1999).

This result substantiates the first part of the notion of the Embedded State, that the state extends into society through individuals who are not paid but act in an unpaid bureaucratic capacity. However, besides team production-specific concerns, unpaid status is not randomly assigned, and given a job title (e.g. mayor) and remuneration status, subsequent task assignment is not random. Finally, anticipating performance, a job may not be instituted to begin with, and tasks may not be assigned (anticipating performance). We tackle these concerns as follows.

The most important concern is the endogeneity of payment. Our strategy is to replace the endogenous payment indicator with an indicator capturing whether a bureaucrat *could* get paid. Our motivation for doing this is the historical observation that most boroughs were impoverished, in line with the earlier observation that historically the Weberian state was unaffordable. Borough income derived mostly from assets, such as land, that were bequeathed to the borough in the past. We measure the impact of this historical process by showing that asset income is balanced with respect to a large set of borough observables. We then compute whether an individual officer is affordable as follows: We compute the market wage for an officer by averaging observed wages across officers with the same task assignment. We compare these wages to asset income to compute whether an officer *could* be paid. To decide the order in which we compare officers to income we calculate a 'salary priority' based on the fraction of comparable officers that are paid. Going through officers in order of priority, we compare predetermined borough income to the market wage. We show that while being unpaid is not balanced with respect to job title, task assignment, and a large set of other officer observables, being unaffordable is. Balance is even stronger when we restrict to compliers, those officers that, in our data, display variation in payment status, removing those that always/never get paid. We then replace unpaid status with unaffordable status and find that being 'out of budget' is associated with a performance increase of twelve percent, very similar to the baseline estimates. While this procedure isolates variation in unpaid status, the institution of a particular office, or the assignment of a particular task may be determined by anticipated payment status. We subset to predetermined jobs and predetermined tasks to show that the effect of being unaffordable does not depend

on the endogenous choice of establishing a certain job, and assigning certain tasks.

The Embedded State relies on a large number of unpaid bureaucrats. Our first results provide a rationale: in our setting, unpaid bureaucrats perform better. The performance difference is driven, in part, by these officers being higher ability. In the second part of this paper, we explore why. The historical literature, which we review in the next section, suggests two classes of potential explanations for differences in performance: Differences in the *selection* of individuals who become bureaucrats and differences in the *incentives* faced by unpaid bureaucrats.

The historical literature on individual boroughs and bureaucrats suggests that prominent individuals in society, such as members of the richer middle class, the gentry, or the clergy, sought out public positions for the social prominence they conferred (Webb and Webb, 1963). In addition, a career in public life often started with unpaid local government work because such jobs acted as stepping stone opportunities to higher positions in the counties or in London. The often-unpaid elite that ran the borough government, called the 'municipal corporation', would appoint further paid and unpaid officers, deciding task assignment and oversight. Typically, they would not elect to constrain themselves, leading to frequent accusations of corruption and nepotism.

We use the report to capture the key aspects of this process. First, to capture the attractiveness of a job, we measure the prestige a particular job affords, as well as whether a job is a stepping-stone job. Second, to capture the on-the-job incentives we measure how flexible a job is, and whether there is oversight (i.e. the presence of a principal). Third, to capture the selection of individuals we first measure, using a second survey that covers a subset of individuals holding office, the titles and social status of individual office holders. Fourth, we capture corruption and nepotism, using the detailed descriptions of malpractice contained in the Municipal Corporations Report. In terms of incentives, we find that unpaid jobs are more likely to be more prestigious, and to be stepping stone jobs. They provide more flexibility and are less likely to feature oversight. In terms of selection, they are more likely to be taken up by the local social elite, and are more likely to be associated with acts of corruption and nepotism.

We then move beyond separate correlations to characterize the organizational system of English local government. We construct a composite index of the selection and incentive measures, and find that selection and incentives co-move: Boroughs that rely on incentives to compensate for being unpaid, are the ones with self-selected officers. In fact, two models emerge: A 'Weberian' model, in which most officers are paid, they are not drawn from the social elite, and offices feature 'rational-legal' incentives; and an 'embedded' model, in which an unpaid elite, drawn from a particular segment of society, governs the boroughs. These individuals, we find, are the higher ability individuals we identified above. When we decompose performance differences into incentives and selection we find that selected, higher ability, in-

dividuals explain the *positive* effect of being unpaid, whereas incentives equalize performance. Incentives and selection also co-occur at the task level. Some tasks, such as governance and judicial functions tend to be unpaid, prestigious, and attract the educated gentry and clergy, whereas others, such as prison management and policing, are more likely to be paid. These latter tasks are less flexible, and typically feature less autonomy. This implies, too, that some tasks are less likely to be able to be executed by the Embedded State, as it is hard to design incentives such that individuals want to execute a task without pay.

Taken together, these econometric results help explain how tax revenues could be so low in early Modern Europe, but governance could still be sufficient to permit economic growth and improve welfare. However, many features of the Embedded State described here are specific to the English sociological context. We therefore hypothesize that the Embedded State in other (historical) settings featured unpaid bureaucrats as well, but that the particular incentives sustaining participation are context specific. For example, Adams (2005) argues that in the Dutch republic the desire to be an unpaid 'regent' was primarily motivated by downstream financial benefits office-holding may bring (see Ashley (1906) and Shaw (1906) for comparative studies, and Appendix Section E for a more detailed comparative discussion). Contemporary Rwanda does not pay most of the people who provide public goods, which may be part of the explanation for quality of governance being on par with Greece or Portugal while its tax-to-GDP ratio is about 15%. Participation in public projects in this context is thought to be mostly community driven (Heldring and Robinson, 2023).[4]

Our paper relates to the recent literature on state capacity referred to above. Much of this, exemplified by the work of Besley and Persson (2009), identifies state capacity with tax revenues, and indeed this is a standard way of measuring capacity in the literature (e.g. Dincecco (2017)). This approach is also common outside of economics (Tilly (1992), Herbst (2000)). Research in sociology has paid more attention to the organization of the state and the bureaucracy. Much of the focus has been on explaining the role of the state in East Asian economic growth, with the state being characterized as "hard" (Jones and SaKong, 1980) and generally highly effective at implementing policy (Johnson (1982), Wade (1990)). These characteristics are tied to the Weberian organization of the state, most explicitly by Evans (1995). The reverse side of this characterization is the work which relates the lack of capacity of many states to their lack of Weberian rational-legal features, in particular their "patrimonial nature" (Bratton and van de Walle, 1997). No scholar to our knowledge has emphasized before the extent to which many state functionaries are unpaid though this sometimes comes up in passing, see Ingelaere (2011) on the local state in Rwanda. It is worth observing that this entire literature has focused on the central government and paid little attention

[4]More speculatively, it is not clear how South Korea implemented its successful state-led development program (Lane, 2025) with tax revenues of only 10% of GDP.

to local government, even though basic services such as public order, judicial services, and infrastructure were historically provided by the local government.

Our paper also relates to the historical literature on the organization of the English state. Following Elton (1953) scholars have examined the emergence of modern state institutions (see Corrigan and Sayer (1985), Braddick (2000) and Hindle (2000) for overviews). While local issues arise, most of this work focuses on central state institutions. Scholars such as Kent (1995) and particularly Eastwood (1994) and Eastwood (1997) have proposed an alternative account of state formation which focuses far more on the local state.

The paper is organized as follows. In Section 2, we discuss the historical organization of the English state. Section 3 describes in detail the data we collect on municipal boroughs and their officeholders. Section 5 outlines four mechanisms for the selection of and incentives for municipal officers, respectively. Section 6 studies the relationship between incentives and selection, showing that they co-move and concentrate in certain public sector tasks, and uses these findings to characterize the 'Embedded State.' Section 4 evaluates the performance of this organizational model in providing public goods in the municipal boroughs. Section 7 concludes.

# 2 Background: The Local State in England and Wales

The Embedded State, we hypothesize, crucially relied on an unpaid workforce. In this section, we bring together the available evidence on the size of the English bureaucracy in the nineteenth century and what we know about its paid status. We find that the number of unpaid officers is about 7 times the size of the paid bureaucracy. We then discuss historical evidence on the organization of the boroughs. Three themes emerge. First, the boroughs were impoverished. Second, they were governed by an elite that saw officeholding as a means of acquiring social status and prestige. Finally, officeholding conferred opportunities to stand for Parliamentary elections, yet some offices were onerous and harder to fill with unpaid officers

## 2.1 Comparing the Central and the Local State

Local government in England consisted of three main layers, which we map in Figure 1. Below the central government, there were 52 counties, and about 10,000 parishes. In between the counties and the parishes were cities and towns, which had various degrees of self-governance. Since we analyze a sample of boroughs, the relevant local term for a town, in more detail, in the next subsection we discuss self-

governance in more detail. In this section we briefly describe the exercise of estimating the size of the local government, and extent to which it was paid. We report the full exercise in Appendix Section A. We count up all individuals employed at all three levels of government using primary archival sources and the (small) secondary literature on this topic. We then follow Goldie (2001), and try to estimate the fraction of bureaucrats that were paid. We find, in line with Brewer (1989), that over the course of the eighteenth and nineteenth century the central state grew from about 5,000 people in 1700 to about 21,000 in 1835. In contrast, local government amounted to *at least* 148,000 individuals in 1835. While all officers working in, or out of, London got paid. The image is very different outside London. Of local government officers, nearly 95% did not receive a salary. This observation is the basis for studying English boroughs to understand the Embedded State.

Because the central state did not pay local officers, it also did not keep any records. While scattered records exist in local archives, there is no systematic data on local employment, with one exception, the Municipal Corporations Commissioners (1835)'s report. This report records a vast amount of detail on municipal boroughs, which were chartered cities. We use this source to construct our dataset. We map total employment and information on salaries for our sample boroughs to Table 1 for comparison, and we map our sample boroughs in panel B of Figure 1. Before we discuss this report, we briefly discuss the history of these municipal boroughs.

## 2.2 The Municipal Boroughs

Municipal boroughs were urban areas that were mostly constituted by a royal charter, but could also be established "by practice and custom" (Chandler, 2007, p. 12). While such charters created a self-government, the governing body, known as the corporation, arose likely by custom (Maitland, 1898). For example, the Webbs in their multi-tome history of local government identified the ability to independently appoint justices as being the key identifying feature of such a borough (Webb and Webb, 1908, pp. 261-6). The relevant fact for us is that there were cities that self-governed. What was the advantage of such a status? "For a town to be incorporated was a mark of status; it denoted the possession of special privileges, with respect to trade and government, which distinguished the town for its surrounding hinterland and its unincorporated neighbors. The rights ... generally included the right to hold courts ... Incorporation also gave the town an identity at law, meaning that it could sue or be sued in the courts" (Sweet, 2014, p. 34). There was a lot of heterogeneity in the rights that charters created or that custom established. Sweet points out that "The rights conferred by a charter varied in detail from town to town" (Sweet, 2014, p. 34), leading to an "anarchy of local autonomy" (Webb and Webb, 1963, p.5). The origins of these charters

are complex, with some arguing that they simply formalized ancient Anglo-Saxon privileges (Chandler, 2007) and others claiming they emerged later as urban areas negotiated with the monarchy for privileges and autonomy in exchange for taxation (Reynolds, 1977).

The municipal corporation appointed both its members and other officers that ran the borough (but were not part of the corporation). There is consensus that the boroughs had few resources and thus needed to use non-financial instruments to motivate the members of the corporation to engage in administration. While parish government could raise rates on property and other things with some flexibility, "In urban areas raising funds was more problematical as the charters of incorporation of many towns did not allow for the imposition of rates" (Chandler, 2007, p. 22). Some boroughs did have endowments of land which could generate incomes, but there were often restrictions on this. Sweet notes about corporations that "their finances were generally extremely restricted. In many cases their governing charter actually stipulated a limit to the value of the property, which they might hold a limit that was not adjusted to keep pace with inflation" (Sweet, 2014, p. 106). This was significant because outside of ports such as Bristol, Liverpool, or London, which had property rights over the harbor and could levy tolls "corporate wealth tended to be derived chiefly from land" (Sweet, 2014, p. 106). The Webbs document different idiosyncratic sources of revenues in different boroughs (Webb and Webb, 1906, pp. 228, 482) but stress the general "paucity of resources" (Webb and Webb, 1906, p. 535). Eastwood summarizes a gamut of restrictions by stating that "towns enjoyed relatively weak fiscal powers" (Eastwood, 1997, p. 79).[5]

Bereft of resources, boroughs could not afford to pay people to undertake all of the functions necessary for the town to function. To understand the structure of incentives it is important to note that the "corporation" was usually composed of local elites. As Innes and Rogers put it "Contemporaries often suggested and historians have largely agreed that the early modern period saw a trend towards the concentration of corporate power in the hands of a relatively narrow elite of townsmen" (Innes and Rogers, 2008, p.538). These elites would be very different depending on the location. In Bristol, merchants—"a powerful body of wealthy magnates"—were "largely made up of members of the Corporation" (Webb and Webb, 1908, p.450). This was typically the case in coastal boroughs, like Great Yarmouth (Gauci, 1996), Ipswich (Clemis, 1999) or Liverpool. In other places more historical elites kept their grip. In Morpeth or Droitwich it was the Lords of the Manor, the Earl of Carlisle (Webb and Webb, 1908, p.493), and the Third Baron Foley (Salmon, 2005, p.94) respectively; in Berwick-upon-Tweed or Coventry it was local Guilds and in Leeds the Corporation consisted of "the leading Church of England families in the town" (Webb and Webb, 1908, p.415); in Gloucester the rulers "were wealthy figures with standing among the

[5]There is absolute consensus amongst scholars on this topic, for example "A remarkable feature of these bodies was the narrow financial foundation on which most of them were reared" (Hennock, 1963, p.214) and see also (Keith-Lucas, 1980, p.32).

county's upper classes, as well as in the city. The gentry contingent included the major landowners Sir John Guise and Sir Duncombe Colchester" (Clark, 1984, pp.325-326).

The Webbs document that the most common borough constitution "was the distinctively oligarchical structure of a close body recruiting itself by co-option" (Webb and Webb, 1963, p.31). By "co-option" they mean "the common obligation to hold public office and vocational organization as the basis of government" (Webb and Webb, 1963, p.37). Those controlling the borough were obliged to govern it on a "vocational" basis, namely without remuneration.

Elites sought office because it generated status and prestige. Sweet notes "Office ... became a mark of status and prestige within the community and was, ideally, desirable in itself" (Sweet, 2014, p. 110). The idea that holding office generated prestige is commonly articulated: "members of the elite gladly became servants of the state ...not simply for the direct material rewards, but also for the prestige and influence those offices conveyed" (Patterson, 1999, p. 3) (see also (Aylmer, 1959, p. 238)). Innes and Rogers also refer to membership of the corporation offering "status or power" (Innes and Rogers, 2008, p.539). In Bolton, Rochdale and Salford "it was possible even for small proprietors to augment considerably their social visibility and position during, and as a result of, successful municipal careers"(Garrard, 1983, p.33) and "recruitment to every office – including the mayoralty – was not just a recognition of social standing but in itself and act of social elevation ... the various positions in, or connected with, the council (aldermanic bench, mayoralty, borough magistracy) were often used to mark the successive stages of social elevation" (Garrard, 1983, pp.33-34). Fraser argues that "The mayoralty ... attached a very special kudos ... [and] offered status" and "enshrined economic leadership with a very special confirmatory imprimatur" (Fraser, 1976, p.149). He quotes Mrs. Gaskell as stating that people were willing to make economic sacrifices "for the power and privilege of being mayor, and the power which it gives them of getting into society."

The elites who constituted the corporation naturally tended to be relatively wealthier as has been documented empirically in many studies using a variety of sources, such as land tax returns (Garrard, 1983; Gauci, 1996; Clemis, 1999). They also often contained the Gentry as we saw in Gloucester and "Throughout the early modern period the rulers of the major cities probably enjoyed the title and reputation of gentlemen within their own communities" (Borsay, 1989, p.229).

Case study evidence also establishes the potential link between members of the corporation and the House of Commons. As the *Times* newspaper put it in 1833, "scarcely an instance of any town sending representatives to parliament where the mayor, aldermen etc. have not regularly seized upon, or clutched at the nomination of the members" (Salmon, 2005, p.97). In Gloucester "the bench enjoyed a near monopoly of parliamentary representation with six of our aldermen elected by the freemen to Westminster" (Clark,

1984, p.319). Of course, it could be onerous to undertake the governing tasks of a borough. In Bristol "In 1810, no fewer than fourteen gentlemen in succession refused to accept nominations as Common Councilmen" (Webb and Webb, 1908, p.469) which led to the imposition of fines. Such fines and penalties were common.

Pulling these themes together, Sweet observes that the corporation of Leeds "had prestige and authority, but a very restricted income, being poorly endowed with lands" (Sweet, 2014, p. 32).

# 3 Data: State Organization in Municipal Boroughs

In this section, we discuss our primary data source, the Municipal Corporations Commissioners (1835) report. We discuss its structure, and then discuss how it records the officers that work in each borough and the characteristics of each office, such as whether it attracts a salary. Boroughs implement several public goods, and we observe the assignment of individual offices to the tasks of providing such public goods. Finally, we observe whether the borough was successful at providing those public goods. Importantly, the report allows us to measure several aspects of the incentives bureaucrats face as well as the selection of individuals into the bureaucracy. We find that boroughs varied considerably in their workforce, whether it is compensated, and their performance in providing public goods. This variation is the basis for the remainder of our paper.

## 3.1 Our Data: The Municipal Corporations Report

Our description of the English local state relies primarily on the 1835 *Report of the Commissioners Appointed to Inquire into the Municipal Corporations in England and Wales*. We discuss its origin before discussing its contents. The report, in a systematic manner, discusses each of 258 municipal boroughs in England. The fact that it systematically discusses each borough, the officers it employs, and its performance on public good provision allows us to use it as a basis for our analysis.

### 3.1.1 Origins and Administration

In 1833, Parliament authorized a royal commission to investigate the English municipal boroughs, whose methods of government were largely unknown. Twenty commissioners[6] were appointed. Most were lawyers or legal scholars, such as Sir Fortunatus Dwarris, author of a renowned 1830 treatise on

[6]Their names were John Blackburne, Sir Francis Palgrave, George Long, Fortunatus Dwarris, Sampson Augustus Rumball, George Hutton Wilkinson, Thomas Jefferson Hogg, Peregrine Bingham, David Jardine, Richard Whitcombe, John Elliot Drinkwater, Edward John Gambier, Thomas Flower Ellis, James Booth, Henry Roscoe, Charles Austin, Edward Rushton, Alexander Edward Cockburn, John Buckle, and Daniel Maude.

statute law, and Peregrine Bingham, a contributor to *The Westminster Review* and friend of Jeremy Bentham and John Stuart Mill. The country was divided into eleven districts; two commissioners were selected to compile reports on each of the first nine, and those who finished first were allocated to the final two stations, comprising London and its surrounding towns. The commissioners were asked to investigate all aspects of the municipal corporations—especially their constitutions, officers, finances, justice systems, and privileges—and given significant powers to do so. They could compel testimony under oath with full authority to summon witnesses and demand all of a town's records (e.g. charters, deeds, and accounts). The commissioners also visited boroughs to assess their infrastructure. The survey that was used to compile the report is described in detail in Appendix Section B.1.

The commissioners were unable to find any official list of municipal corporations. They investigated 285 places, 246 of which they found to possess municipal functions. Five towns refused to offer up any information, while four participated in an incomplete way.[7] Across the main report and a 1837 follow-up, we have data for 258 boroughs. We omit London.

### 3.1.2 Contents

What does the report tell us about the administration of the local state? The commissioners sent the mayor or town clerk of each borough a form letter describing sixteen topics of interest, listed in full in Appendix Section B.1. This standardized survey, in combination with borough records and witness reports, resulted in towns' reports having a relatively uniform structure. To illustrate the contents of the report, we focus on the borough of East Looe. We provide photographs of the relevant excerpts of the report in Figures 2-5.

After discussing the boundaries of the borough, and details on its governing charter, each borough description goes through a list of offices that are occupied in a borough. We from now on use the terminology *officer* to describe an individual who holds an office that exists in a borough, such as a mayor. See Figure 2 for the several officers from the officer list of East Looe.

**Officer List** Critically, the commissioners requested information on "[t]he several Officers of the Corporation, how, and by whom elected, or removed; the time for which they hold their respective offices; their respective Functions and Privileges, and their Salaries and incidental Emoluments." This resulted in a comprehensive list of officers for each borough. A typical town's chapter enumerates *all* offices occupied by officers in the corporation, and first records the means of appointment for an officer. An officer can be

[7] This is because the attempt by parliament to collect information was seen in some boroughs as an illegitimate exercise of authority - see the discussion in Chapter 5 of Sweet (2014).

elected or appointed. If the officer was *appointed*, the principal is named. From this information, we record an indicator equal to one if an officer has a principal. Next, the report describes the officer's functions, i.e. the *tasks* performed in the borough. Some officers performed only a single task; others were assigned to a range of roles across several domains. The report then lists the salaries of all paid officers. Fees or in-kind payments are mentioned, and oftentimes an estimate is given of their total monetary value. It is explicitly mentioned if an officer does not receive any salary *or* other forms of compensation. We record an indicator equal to one if an officer does not receive anything.[8]

The officer list is also clearly ordered by *prestige*. It always begins with the mayor and governing body. It then lists all municipal offices, starting with judges and clerks, before discussing the 'inferior officers', such as the crier or mace-bearer. For example, Figure 4 shows that in East Looe the Recorder, who is an important legal officer (in East Looe, in other boroughs recorders have other tasks), is more prestigious than a Serjeant at Mace. The *names* of officeholders are not systematically recorded. We therefore complement our data with additional data sources on individuals, which we describe below.[9] The report subsequently records, in free-form comments, corruption and nepotism. We record an example of this in Appendix Figure B.2. There are two remaining parts of the borough data. First, the report records financial data. Often, there are detailed borough accounts, showing a line-by-line account of sources of income and items of expenditure. As an example, we report East Looe's accounts in Figure 5. Second, there is information on public good provision. We will outline these in more detail in the next section.

### 3.2 Officers and Tasks

We digitize all offices from the municipal report. We record their titles, paid status, and salary where applicable. We also map offices to their respective tasks. In this section we discuss these tasks, which are simply the provision of the principal borough public goods. Appendix Section B.2 provides summary statistics.[10] In Table 3 we present statistics of officers for several boroughs. For example, the first line of this table shows that Liverpool employed 203 officers, and that the most common officer title is a 'watchman' which is employed in law enforcement. The smallest borough, Newtown, employs three officers, none of whom get paid, and the most common officer is a clerk. In Table 3, in contrast, we present data at the level of the officer. The most common officer across all boroughs is the constable. We observe constables in 226 out of 258 boroughs, and in total we observe 1228 constables. 70 percent of constables are unpaid and

[8]There are other margins that we can measure. In the Appendix, we measure whether someone is unpaid or whether someone gets a market wage, rather than any compensation.

[9]As a preview: We compile evidence on officers' identities and characteristics from two sources: first, from a 1790 gazetteer of notable inhabitants of English towns, and second, from the biographies of members of Parliament—for whom municipal office was often a stepping stone to national honors.

[10]Some offices consist of a large number of officers. We truncate office size at the 90th percentile (10 officers) to reduce the scope for outliers. We demonstrate robustness of our main results to this choice in Appendix Section C.

they are, on average, assigned to 1.13 tasks. The most commonly assigned task is law enforcement. The least common officer we observe is the catcher, which is employed in two boroughs, and each borough has one catcher. One out of two catchers gets paid, and they are, on average, assigned to two tasks. Their most common task is clerical work.

The first public good that boroughs provide is the general management of their affairs. This includes personnel management, as well as the general oversight of public good provision. For example, if the police doesn't function well because not enough policemen have been hired, this is a managerial problem. We label this task 'governance' and record officers who are listed as "conducting the affairs of the borough" as governing. Typical officers engaged in governing are the mayor and the aldermen. The second public good that was provided was a judicial system. Through several different courts, borough provided opportunities to redress grievances ranging from small claims to criminal charges.[11] Figure 3 reports the courts present in East Looe. Several officers are typically either listed as local judges or a justices of the peace, a judicial title that connected them to the county judicial system. We record as being involved with judicial services any officer who is listed as an active judge. These are often the mayor and (capital) burgesses,[12] and sometimes dedicated justices. The third public good that boroughs provide is the management of their finances. Although boroughs were often impoverished, they did manage the collection and disbursement of their funds. Some kept accounting records. The typical officer in charge of funds is called the 'chamberlain'. Fourth, in addition to financial management, borough had various clerical tasks to perform. These range from managing judicial process, to transacting the legal business of the borough, to coroner's inquests. The most common officer in charge of this task was the Town Clerk. Fifth, boroughs built and maintained several types of infrastructure. These ranged from roads, to street lighting, to borough-specific public property, like harbors. Finally, boroughs were in charge of various aspects of law and order. We record as the 'prison' task the management of the borough 'gaol'. The typical officer in charge of prison management is a 'gaoler' (jailer). Finally, we observe policing. The most common office title in charge of public order was the constable. Figure 4 shows the report's evaluation of policing, prisons, and infrastructure in East Looe.

Officers can execute several different tasks. While some offices, such as the gaoler, are tightly connected to some particular task, others are not. Mayors, for example, often engage in governing, judicial tasks, and yet other tasks, like financial management or infrastructure management.

[11] In more detail, there are courts akin to small claims courts, typically related to markets. There are various criminal courts and finally, there are courts that historically had a role in the appointment of officers that were part of the manorial affiliation of a borough, called courts leet and courts baron.

[12] Capital burgesses, just like regular burgesses, are wealthier individuals that have the right to be part of the municipal corporation. The rules that determined who became a burgess varied by city.

### 3.3 Boroughs

Next, we introduce borough covariates. We observe a wide array of borough characteristics. Appendix Section B.3 details each source and provides summary statistics. To capture location we record distance to the nearest river, distance to the nearest market town, London, the nearest coal field, distance to country border. To capture historical economic development, we code an indicator equal to one of a borough was a sea port or a market town in 1680, and we collect the amount of tax revenue raised in the fourteenth century as a measure of initial differences in wealth. To capture local geography we measure the soil suitability for growing wheat, maximum attainable wheat yields, maximum attainable yields on pasture, slope, longitude, latitude, and town size by area. To capture baseline political characteristics we code an indicator variable equal to one if the manorial lord was involved in borough government, the year of the borough's latest charter, and the number of noblemen living in the town, and similarly the numbers of members of Parliament, knights, gentlemen, bishops and baronets who reside in the borough, all measured in 1680. We also include the number of gentry present in 1370.

## 4 Performance of the Embedded State

We now evaluate how well the Embedded State performed at providing public goods. Specifically, we compare the performance of unpaid to paid officers in each borough across the seven core borough tasks. Our analysis proceeds in four steps. First, we describe the construction of the borough-task performance data. Second, we present descriptive comparisons of performance outcomes for paid versus unpaid officers. Third, we outline how our empirical strategy addresses issues of estimation and identification. Fourth, we report results and associated robustness checks.

### 4.1 Measuring Performance

We discussed in the previous section that boroughs provided a range of public goods. We consider the provision of each public good a *task* within the borough, and the bureaucrats assigned to a task the *team* performing that task. Because we want to compare individuals *within* borough by remuneration status, we need to measure task-level performance consistently across public goods. For comparability across tasks and boroughs, we binarize each performance variable at the median, to generate seven binary performance indicators per borough, one for each task. Appendix Section B.4 provides details and summary statistics. We report robustness to alternative binarization thresholds in Appendix Section C.4. In this section, we also repeat our analysis with performance measures that are recorded outside the report.

We start with the overall governance of the borough. The management of the borough was in the hands of the municipal corporation. An ideal measure of performance therefore assesses how well a borough is governed, from appointments of individual offices, to the application of public goods and services, such as the police, to their desired ends, like public order. To assess overall governance quality, we use the *Analytical Index* of the Municipal Corporations Report. This index systematically records mismanagement from the open-ended discussion of the general management of the borough which appears in the report. In total, it records *mis*management in eight categories ranging from 'neglect' and 'misconduct,' to incompetency.' We count the number of times a borough is mentioned in these categories and code a variable that is equal to $8 - \zeta$ where $\zeta$ is the number of times a borough is mentioned from zero to eight. This way, a higher score captures better governance. For judicial performance we simply count the number of courts held in a borough. These range from zero to nine, as recorded in the Municipal Corporations Report. To measure how well a borough had its finances in order, we record from the report an indicator for whether the borough kept official accounts, as recorded in the report. Separately from financial administration we record the quality of clerical administration. The report records how many documents about its history and organization a borough supplied to the commissioners of the report. We record the total, which ranges from zero to 137.[13] For infrastructure we directly measure, from the report whether a borough was paved or lit at night. We thus construct a count variable that ranges from zero (neither paved nor lit) to two (both paved and lit), to capture basic public infrastructure provision. Finally, the report contains two performance measures on law and order. First, the report classified the quality of the town's prison facilities as either 'absent,' 'inadequate,' 'adequate,' or 'superior.' We thus construct an ordinal variable ranging from zero ('absent') to four ('superior'). To capture the quality of policing, we follow the same structure as for prisons. Boroughs are categorized as having no police force, or one deemed 'inadequate,' 'adequate,' or 'superior,' which we convert into a four-level ordinal variable.

We then binarize all count or ordinal performance measures at their median. This results in a comparable performance indicator at the borough-task level $bt$.[14] We provide a tabular overview of the information in this section in Table B.3.

## 4.2 Descriptive Evidence

Our objective is to compare the performance of unpaid versus paid officers across tasks. Using the officer-task linkage described in Section 3.2, we match each officer-to-task performance of the tasks they

[13] These include current and past charters, financial documents, and other documents such as maps, bye-laws, and lists of members of the corporation.

[14] We assess robustness to alternative performance measures and binarization thresholds in Section 4.4.

are assigned to. In a first step, we examine unconditional differences in performance: for each officer, we calculate the mean performance across all tasks to which they are assigned. We then average across officers.

Figure 8, Panel A reports officer-level performance averages separately for paid and unpaid officers. Unpaid officers exhibit significantly higher average task performance than their paid counterparts. The difference is statistically significant.

Panel B controls for borough-level confounders. Specifically, we estimate the relationship between unpaid status and performance after partialing out borough fixed effects. The horizontal axis reports the officer-level predicted probability of being unpaid, while the vertical axis shows residualized performance. We find a positive and statistically significant linear association: moving from a predicted unpaid probability of zero to one is associated with an increase in residualized mean performance from approximately 0.43 to 0.6.

## 4.3 Empirical Strategy

Our empirical strategy addresses two central challenges in identifying the effect of unpaid officer status on public goods provision performance.

First, we observe officer-level unpaid status, whereas performance is measured at the borough-task level. To link the two, we consider each borough-task pair as a *team* composed of the officers assigned to it (e.g., a town clerk and a mayor engaged in legal work). Following the econometrics of team production (Bonhomme, 2025), we attribute team-level outcomes to differences in individual-level unpaid status in Section 4.3.2.

Second, getting paid is not randomly assigned, nor is officer to task assignments. If there is selection that correlates with performance outside of its relationship to unpaid status, simple estimates of the difference between unpaid and paid officers will be biased. To address this, we control for a broad range of potential confounders across boroughs, tasks, and officers. We then isolate a plausibly exogenous variation in the likelihood of being unpaid. We discuss our approach in Section 4.3.3. Finally, we discuss the possibility of not instituting a particular office anticipating (non)payment, or not assigning tasks to a given office anticipating nonpayment. To mitigate these issues we focus on offices that are instituted by charter and are therefore predetermined, and on tasks that are the modal task for a given office *title* (e.g. if the gaoler would do another task, he would not be called the gaoler).

#### 4.3.1 Main Estimating Equation

In our dataset we observe 258 boroughs ($b$). For each borough, we record performance on the seven distinct tasks ($t$), resulting in 1,330 unique borough-task teams, indexed by $bt$. We observe a total of 6,558 officers ($bo$) working on at least one team. Officers may work on multiple teams, but always within the same borough. Our empirical strategy rests on three key variables:

First, a performance indicator for each team:

$$Y_{bt} = 1 \text{ if team } bt \text{ records above median performance, } 0 \text{ otherwise.}$$

We then record an assignment indicator for each officer-team pair:

$$w_{bot} = 1 \text{ if officer } bo \text{ works on team } bt, 0 \text{ otherwise.}$$

Finally, we record unpaid status:

$$u_{bo} = 1 \text{ if officer } bo \text{ is unpaid, } 0 \text{ otherwise.}$$

Our baseline approach rests on a simple triple difference estimating equation at the officer-task level:

$$Y_{bt} = a\, w_{bot} + b\, w_{bot} u_{bo} + X_b\, \mathbb{1}(\tau = t)'\theta + \delta_b + \delta_t + \delta_o + e_{bot}, \tag{1}$$

where $b$ captures difference in performance of unpaid officers, conditional on the assignment of officers ($w_{bot}$) to teams assignment and controls: $X_b\, \mathbb{1}(\tau = t)'\theta$ denotes borough latitude and longitude polynomials, $X_b$, interacted with task indicators $\mathbb{1}(\tau = t)$. $\delta_b$, $\delta_t$, and $\delta_o$ are borough, task, and office fixed effects, respectively.[15] Standard errors are clustered at the team ($bt$) level.

We relate the results from the baseline estimating equation (1) to the structural model of team production developed by Bonhomme (2025), as described in Appendix Section C.1. Accordingly, our robustness analysis proceeds along two dimensions. First, we examine whether our results are robust to alternative model specifications, controls, and assumptions on team production specific issues. Second, we assess robustness to the assumption that paid status is exogenous.

[15] Office fixed effects distinguish, for example, mayors from chamberlains.

#### 4.3.2 Empirical approach: Team Production

Our setting is a team production setting. In Appendix Section C.1 we develop a simple team production model following Bonhomme (2025). This model allows us to do three things. First, it allows a robustness check in which we estimate the structural equivalent of equation 1. Second, this model shows that to correctly estimate the effect of being unpaid we need an assumption on spillovers. In particular, we have to assume that there are (1) no within-team spillovers and (2), no cross-team spillovers. Third, the model shows that we only estimate the effect of being unpaid correctly if we correctly estimate the estimated returns to team size (assumption (3)).

Appendix Section C.2 addresses potential violations of assumptions (1) and (2) in four ways. First, we assess the robustness of our estimates to alternative clustering levels of our standard errors, such as borough or county, and allow for spatial dependence in the error structure. Such dependence may occur if the performance of a team spills over onto a team in another borough. Second, we account for the performance of *other* teams within the same borough, directly capturing potential local spillovers. Third, we restrict the sample to contexts where within-team spillovers are likely limited by focusing on single-member teams. Fourth, we aggregate the data to higher levels: to internalize within-team spillovers, we estimate results at the borough-task (team) level; to address cross-team spillovers, we aggregate to the borough level.

To address potential violations of assumption (3), Appendix Section C.3 shows the robustness of our results to a wide range of assumed returns-to-size parameters, suggesting that our findings do not hinge on a particular assumption about scale effects.

#### 4.3.3 Empirical approach: Officer-Task Assignment

While Section 4.3.2 outlines conditions under which average differences in individual contributions to team performance can be estimated, being paid is not randomly assigned, nor is task assignment. In this section we review three strategies we follow to address these concerns.

**Fixed Effects** Equation (1) includes a rich set of fixed effects to absorb several sources of variation in performance, paid status, and task assignment. Borough fixed effects $\delta_b$ capture differences across boroughs, including variation in resource endowments and the identities of Municipal Report surveyors. Task fixed effects $\delta_t$ absorb average differences in task complexity, staffing norms, and compensation structures (e.g., governing may be more complex and differently staffed than lighting or paving). Office fixed effects $\delta_o$ account for performance differences associated with specific offices — e.g., mayors might perform better

on average. In addition, we can introduce task scope fixed effects $\delta_s$ and county-by-task fixed effects $\delta_{ct}$ to absorb unobserved, task combination- or county-specific influences on task performance in Appendix Section C.4.[16]

**Controls** Remaining sources of confounding arise at the borough-task ($bt$) and officer-task ($bot$) levels. We address these in four ways. First, equation (1) includes borough latitude and longitude polynomials interacted with task indicators: the term $X_b \, \mathbb{1}(\tau = t)'\theta$ flexibly captures location-specific heterogeneity in task feasibility — for example, revenue collection may be easier in coastal towns, or policing more difficult near London. Second, we can control directly for officer characteristics that may be correlated with performance, such as whether the officer is a Justice of the Peace (Besley et al., 2025). Third, we implement a matching exercise, matching each officer to a nearest neighbor using a full set of borough and officer characteristics. Finally, we can account for potential outliers by leaving out one task at a time from estimating equation (1), or by varying the threshold rules in constructing our binarized performance data. These robustness checks are reported in Appendix Section C.4. In this context, we also show robustness to alternative measures of task performance.

**Quasi-Exogenous Variation: Affordability** Our final strategy is to isolate variation in unpaid status $u_{bo}$ that is plausibly exogenous. As discussed in Section 2, most borough revenues were low and predetermined. This means that the predetermined component of borough income constrained the *affordability* of paying an officer, given a market wage for that officer. We construct a measure of affordability combining wages of officers across all boroughs with a borough's predetermined income. This measure, which we describe in detail in Section 4.5, is a strong predictor of whether officers were paid, yet is balanced across a wide range of borough characteristics and officer characteristics. We show that our results remain robust when we instead relate performance to whether an officer was affordable, rather than to whether an officer was actually paid. We also show that these results are not driven by functional form choices of calculating affordability.

## 4.4 Results: Unpaid officers

Table 4, column (1), presents estimates of equation (1) including borough and task fixed effects. Conditional on an officer being assigned to a specific task $t$, unpaid status is associated with a performance increase of 0.10 (clustered standard error: 0.02), relative to a mean of 0.63. This effect is statistically significant at the 1% level. In column 2, we add geographic-task interaction controls, and in column 3, we

[16] Task scope fixed effects are fixed effects for each task-assignment combination. For example, all officers that are involved with both policing and prison are in one group, as are officers that are just involved with policing, or just involved with prisons.

include office fixed effects. The estimated coefficients are 0.12 (s.e. 0.02) and 0.13 (s.e. 0.02), respectively. In Appendix Section C.1, we develop our model to show that the effect of turning the median-size team from paid to unpaid increases performance by 32 percentage points relative to the mean team performance.[17] These results mirror the descriptive patterns shown in Figure 8: unpaid officers, on average, outperform their paid counterparts.

Interpreting $\hat{b}$ as the causal effect of unpaid status on performance requires the identifying assumptions discussed in Sections 4.3.2 and 4.3.3 to be met. Specifically, this requires that spillovers (within and across teams), returns to team size, and borough-task or officer-level characteristics do not jointly influence both performance outcomes and compensation status. We implement robustness checks discussed in Sections 4.3.2 in Appendix Sections C.2 (spillovers) and C.3 (team size). Robustness checks associated with Section 4.3.3 are reported in Appendix Section C.4. Together, this evidence suggests that the observed performance premium among unpaid officers is unlikely to be driven by measurable confounders or spillovers.

The key finding of this paper is that unpaid officers outperform paid officers. This suggests that embedded incentives and selection increase — rather than merely equalize — performance. In the Appendix, we apply the standard AKM fixed effects technique to recover individual contributions to team production (Abowd et al., 1999). We find that unpaid officers are on average higher ability than their paid counterparts. This may explain why, when unpaid status and its concomitant incentives attracts higher status individuals, they subsequently outperform their counterfactual paid counterparts.

## 4.5 Results: Unaffordable officers

If the team production assumptions are met, the results in the preceding section can be interpreted as causal if being paid is assigned exogenously. In addition to the robustness checks implemented above, we isolate a predetermined component $v_{bo}$, of paid status $u_{bo}$, and relate this to performance outcomes. Our strategy builds on the observation, detailed in Section 2, that boroughs operated under tight fiscal constraints. Borough income mainly derived from rents on inherited assets, primarily land. These were allocated to boroughs in a manner that was predetermined and plausibly unrelated to borough performance centuries later. Therefore, the ability to pay officers was shaped by predetermined and exogenous features of borough finances.

We operationalize this idea by computing whether an officer was *affordable* to the borough, given its rental income and the prevailing market wage. We then replace whether an officer was actually paid by

[17] The median team size is two. We then estimate the returns to scale to team size, multiply the estimated unpaid coefficient and the estimated returns, and divide by mean team performance in our sample.

whether that officer was affordable given rental income. In Appendix Section C.5, we show that choices of functional form when computing affordability do not drive results.

The construction of an affordability indicator for each officer proceeds in three steps. First, we digitize historical borough balance sheets around the time of the reform to record predetermined rental income.[18] Second, we proxy the prevailing market wage of a given officer by calculating the average salary of paid officers with the same task profile across all boroughs. For example, the average wage among paid governing officers defines the market wage for considering whether paying a governing officer would be affordable.

Third, we construct a salary prioritization scheme. We construct this priority order by calculating, for each officer title, the share of officers in *other* boroughs with that task profile who were paid. Titles that are paid more frequently receive higher priority. We then use these data components to proxy whether an individual officer was affordable for a borough. We consider officers sequentially. For each officer, we check whether the officer's market wage can be covered by the remaining disposable predetermined rental income income after accounting for prior salary commitments. This procedure yields an officer-specific affordability prediction $v_{bo}$.[19] In Appendix Section C.5, we consider robustness to the calculation of market wages and prioritization.

Affordability $v_o$ is thus jointly determined by borough rental income, market wages, and prioritization. One implication of this is that high-priority officers with low market wages will almost always be affordable, while officers with high market wages and low priority will almost never be affordable. To focus on those officers where borough rental income actually makes a difference for affordability, we can restrict our sample to 'compliers:' officers on the margin of being affordable or not. We operationalize this notion as follows. In 1,000 iterations, we randomly shuffle borough rental incomes within counties and re-compute affordability. For each officer, we thus calculate the fraction of times the officer would be affordable under counterfactual rental income. We then identify as *complier* officers those that are (1) unaffordable to the specific borough but in the upper quartile of counterfactual affordability, or (2) affordable to the specific borough but in the lower quartile of counterfactual affordability. We identify 3,911 such complier officers out of 6,558 total officers.

[18] The Municipal Corporations Report provides the first comprehensive survey of borough income, typically averaging accounts from the years preceding the report. We also digitize budget surveys from 1837 and 1838 and average across years. Our results are not sensitive to the choice of reference year.

[19] For example, consider a borough with ten pounds of rental income and two officers: a constable responsible for law enforcement (market wage seven pounds) and a governing mayor (market wage ten pounds). In other boroughs, law enforcement officials are paid more often than those governing, so the constable is prioritized. Paying the constable costs seven pounds, leaving three pounds. The mayor's wage cannot be covered, so $v_{bo} = 0$ for the mayor, and $v_{bo} = 1$ for the constable.

**Balance.** Two key testable implications derive from the historical evidence in Section 2. First, rental income should exhibit balance with respect to predetermined borough characteristics. Second, predetermined aspects of an office should be unrelated to unaffordability $v_{bo}$ (but not necessarily to unpaid status $u_{bo}$), especially in the complier sample.

To evaluate this, we estimate the following linear models using OLS:

$$I_b = \beta_0 + C_b\Gamma + \varepsilon_b, \tag{2}$$

where $I_b$ is borough-level rental income, and $C_b$ is a vector of borough-level covariates. The borough characteristics introduced in Section 3 comprise of several measures of location, historical economic development, features of the soil, and historical political and social structure. All covariates are standardized for comparability.

Figure 9, Panel A summarizes the results. We plot coefficients $\hat{\Gamma}$ along with 95 percent confidence intervals. We find that, for all covariates, estimated coefficients are equal to or below .2 of a standard deviation and all covariates are not statistically different from zero. Rental income is thus plausibly unrelated to borough characteristics, underlining its use as a source for $v_{bo}$.

Next, we turn to officer-level characteristics:

$$x_{bo} = \beta_0 + C_{bo}\Gamma + \delta_b\varepsilon_{bo}, \tag{3}$$

where $x_{bo} \in \{u_{bo}, v_{bo}\}$ is either an indicator for whether officer $bo$ was unpaid or unaffordable, with $C_{bo}$ a vector of officer-level covariates. We include all officer characteristics from Appendix Table C.14, indicators for the top ten offices in our data, and indicators for the modal task profile of each office. $\delta_b$ denotes borough fixed effects. Standard errors are clustered at the borough level.

Figure 9, Panel B summarizes the results, again plotting coefficients $\hat{\Gamma}$ along with 95 percent confidence intervals. Unpaid status is significantly related with officer characteristics (Panel B.1). Panel B.2, by contrast, shows that unaffordability is much more balanced across characteristics. All estimated coefficients are small. In Panel B.3, where we restrict attention to compliers, coefficients are statistically insignificant throughout. This balance supports the interpretation of $v_{bo}$ as a plausibly exogenous source of variation in officer payment status. Note that these characteristics include whether an office holds a particular office (e.g. mayor) or does a particular task (e.g. governing). Unaffordability is therefore unrelated to a particular office or task, it is driven by predetermined borough income and (exogenous) market wages.

**Results.** We now estimate the main regression equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$. Table 5 presents these results in the same structure as Table 4 for the restrictive complier sample.[20] In the most stringent specification (column 3), unaffordability is associated with an increase in officer performance of approximately 0.17 (clustered s.e. 0.04), relative to a sample mean of 0.62. The comparable effect size in the previous section is 0.13. The estimated coefficient is somewhat larger, is significant at the 1% level and supports a similar conclusion: Unpaid officers, in this case isolated through predetermined borough budgets, outperform paid officers.

We address three potential concerns with this finding in Appendix Section C.5. First, we vary the definitions of market wages and priority rankings (by, for example, using only data from the county in which a borough is located). Second, we consider that larger rental income might directly affects financial performance, dropping this task from the analysis. Finally, we study the extensive margin of task assignment: boroughs may just not appoints certain officers, anticipating that they may have to pay them. We address this issue by subsetting to officers explicitly mentioned in the borough charter, and to their modal tasks (given their job title). These officers were always appointed, and their modal tasks are arguably predetermined: a mayor expected to only work the jail would not be called "mayor." We then repeat our analysis using just charter officers and modal tasks. Throughout, our results are qualitatively similar. This last robustness check is very important, because it removes any selection coming from *which* offices are instituted in a borough (anticipating paying the officer or not) and which tasks are assigned to a given officer (anticipating paying them or not): Among predetermined officers and their modal tasks, isolating predtermined (un)affordability we find a similar result to the basic comparison in section 4.4.

In sum, even when looking at predetermined officers, task assignments, and payments, we find a similar result to Table 4. We interpreted this result above through the lens of incentives and selection. The Embedded State provides incentives that compensate for being unpaid, and this package, plus its concomitant task assignment, attracts a particular group of people that happen to be higher ability than the average paid officer.

# 5 Officers: Incentives and Selection

In this section, we study how an unpaid local state organization in England was sustained. We first distill four aspects of the incentives and the selection of the officers, respectively, from our borough report. For each aspect, we then derive a measure at the officer level and assess the comovement with unpaid status. In Appendix Section B.5, we discuss these measures in detail and show descriptive statistics.

[20] In Appendix Section C.5, we show the (very similar) results from using the unrestricted sample.

## 5.1 Incentives

The borough report discussed in Section 3 suggests several dimensions along which offices differed, and which may have acted as substitute incentives for payment. Here we discuss the ones we measure and use in our analysis. We operationalize each incentive as a variable based on our data. In Appendix Section B.5, we derive an alternative measure for each incentive and demonstrate robustness to the specific choice of measure.

*Prestige.* One way to motivate officers was through prestige. In the report, prestige becomes very clear. Each borough has a separate chapter, and each officer is discussed in order. This order first features the most important officer of the borough. Common titles for this officer are mayor and headborough. The report then lists officers that are less important.[21] We thus measure prestige by examining the *ordering* of individual offices within each borough record in our data source. Since boroughs vary in their number of officers, we normalize the ranking to lie between zero and and one within each borough.

*Career Concerns.* Another way to motivate officers was through career concerns. Serving in a borough office was often a stepping stone to become a Member of Parliament. At least 11% of MPs held a borough office at some point in their careers. To measure career concerns, we consider the careers of Members of Parliament. We use the database of biographies of MPs collected by the History of Parliament project (Namier and Brooke, 1964; Thorne, 1986; Fisher, 2009). We process the career paths of all MPs between 1754 and 1832. We record whether a MP held a municipal position and if so, which one. This gives us a list of offices, such as Mayor or Town Clerk, that were stepping stone positions to a career in Parliament. We then record an indicator equal to one if an office is a stepping stone office to measure the potential of career advancement through office holding. On average, about half of distinct offices have ever been held by an individual that subsequently went on to be an MP.

*Flexibility.* Offices varied in their flexibility of tasks. While each office was usually tied to a clear task, in some boroughs, officers were tasked with a broader range of activities, providing flexibility: a gaoler might have inspected infrastructure in addition to keeping the gaol; a mayor, tasked with governing, could also be involved with justice and infrastructure management. We derive an office-specific measure of flexibility. First, we measure the modal task assignment of each office. Second, we compute the share of actual tasks that an officer in a borough executes that are outside the modal assignment. The more non-standard tasks an officer executes, the higher this measure is. On average, one third of tasks assigned to an officer are non-standard.

*Autonomy.* A key margin of officer autonomy was whether open positions were filled by appointment

[21] Figures 2-5 and Appendix Section B.5 show example pages of our data source.

or election. Some officers were directly appointed by the governing body of the borough. Elected officers, on the other hand, had no direct principal. We construct an indicator of whether an officer was appointed by a direct principal (usually a member of the governing council) or not.

## 5.2 Selection

Setting up incentives in the above way suggests that a select body of the population might disproportionately seek these offices. We study advantageous and adverse selection.

*Gentry and clergy.* Historical evidence suggests that members of the gentry were often found in local offices (see e.g. Eastwood (1994)). Similarly, the clergy were thought to be disproportionately involved in local government. We collect data on individuals from Barfoot and Wilkes (1790). This data source records lists of prominent inhabitants of hundreds of towns in England, with their names, titles, and their borough office, if they held one. This allows us to measure whether, at this point in time, an office in a borough was held by someone with a title.[22] From this data source, we measure an indicator variable equal to one if an office was held by a gentleman, a zero otherwise.

*Corruption and nepotism.* While individual officers can be positively selected on social status and, perhaps, civic dutifulness, they can also be negatively selected. They may try to use offices for private gain or use the powers of an office to appoint friends and family. In fact, the borough report features many instances of corruption and nepotism. To measure the selection of more corrupt individuals, we focus on a particularly interesting part of our data source. Each borough record includes a discussion of the general management of the borough. This includes discussions of corruption and nepotism, the appointment of favorites and family members. We record an indicator variable equal to one if an office in a borough was associated with cases of corruption, and zero otherwise.[23] We similarly record an indicator for nepotism.

## 5.3 Incentives and Selection: Descriptive Evidence

We study whether the incentive and selection measures introduced above are correlated with unpaid status. This is informative about which aspects of a job compensate for not getting paid, and about who selects into an unpaid job given these incentives. We use our dataset of individual officers. Within this dataset, we estimate the following linear model, using OLS:

[22] Unfortunately, no comparable data sources are available closer in time to 1835 when the Municipal Corporation report was compiled.

[23] Appendix Section B.5 shows examples.

$$Y_{bo} = \beta u_{bo} + \delta_b + \epsilon_{bo}, \tag{4}$$

where $Y_{bo}$ are the dependent variables introduced above, measured for officer $bo$ in borough $b$. $u_{bo}$ is an indicator variable equal to one if officer $bo$ is not paid. $\delta_b$ is a vector of borough fixed effects. $\epsilon_{bo}$ are clustered at the borough level. Tables 6 and 7 report estimated coefficients, which estimate the linear relationship between being unpaid and $Y_{bo}$.

#### 5.3.1 Incentives

Table 6 shows results. Across columns we vary outcome variables and the first row of this table provides estimates of $\beta$ across our four outcomes. In Columns (1) and (2) we study prestige and career concerns. In both regressions, we include borough fixed effects, and we therefore compare unpaid to paid officers, partialling out borough level differences in outcomes and unpaid status. We find that being unpaid is positively correlated with prestige and career concerns. Unpaid officers are, on average, in jobs that are about 41% more prestigious than unpaid officers relative to the baseline mean, and that are about 56% more likely to be stepping stone jobs to a Parliamentary career relative to the baseline mean.

In Columns (3) and (4) we study the flexibility and autonomy of the jobs held by unpaid and paid individuals. In Column (3) we document a positive correlation between being unpaid and the flexibility of assigned tasks. On average, unpaid officers' task assignments are about a third more flexible than paid officers' assignments. In Column (4) we document that unpaid officers are about 45% more likely to be elected than appointed. We interpret this difference as being consistent with greater autonomy since those appointed have a recorded direct principal.

#### 5.3.2 Selection

Next, we study whether individuals taking up an unpaid job are different from those taking up a paid job. Table 7 reports results of estimating equation (4) using selection outcomes.

In Column (1), we use as the dependent variable an indicator variable equal to one if an officer had a gentry title. We find that unpaid officers are about one third more likely to have a gentlemanly title than paid officers are. In column (2), we study clergy status. We find that unpaid officers are, on average, much more likely to be clergy. One percent of officers are members of the clergy on average, but being unpaid increases the probability of being a member of the clergy by two percentage points. In columns (3) and (4) we study corruption and nepotism. We find a positive and significant association between

being unpaid and being corrupt or engaging in nepotism. Corruption is six percentage points higher for unpaid officers relative to unpaid officers, compared to a mean of seven percent. For nepotism, we find that unpaid officers are six percentage point more likely to engage in nepotism (mean: 0.06).

In this section we analyzed several margins of selection and characteristics of individual officers that are correlated with being unpaid. The analysis in this section, looking at separate correlations, leaves two questions about the co-movement of incentives and selection unanswered: First, while both incentives and selection are correlated with being unpaid, they may be complements or substitutes at the officer level. Similarly, these incentives and selection criteria might be complements of specific tasks. We now investigate these dimensions.

### 5.4 Incentives and Selection as Determinants of Performance

In Appendix Section D we decompose our performance results into the contributions of incentives and selection and we find that incentives *equalize* performance between paid and unpaid officers, and that selection is responsible for unpaid officers outperforming paid officers. This result supplements our results in section which showed that unpaid officers were higher ability. The two results combined suggest that the unpaid officers outperformed paid ones because they were higher ability, which may be in part driven because they were (positively) selected.

## 6 A Characterization of the Embedded State

Section 5 analyzes separate correlations between unpaid status, non-monetary incentives, and individual-level selection margins. In this section, we ask whether these elements co-move — whether they together constituted a *system* of borough governance.

The analysis proceeds along two dimensions. First, we assess whether the incentive and selection margins functioned as complements or substitutes. We find that unpaid status, incentives, and selection are strongly co-move. Second, we examine whether incentives and selection co-occur across tasks in Section 6.2. We show that indeed unpaid status, incentives, and selection margins concentrate in certain tasks.

### 6.1 Incentives and Selection Across Officers

We analyze the relationship between incentives, selection, and unpaid status in our officer-level data. Our goal is to assess whether these dimensions co-move systematically — whether they form a broader

organizational logic.

To do so, we proceed in two steps. First, we estimate the relationship between incentives and selection. Second, we highlight unpaid status in the resulting incentive–selection space to assess whether unpaid positions occur in particular regions of incentive and selection intensity.

We construct standardized indices for selection and incentives at the officer-by-borough level. Specifically, for officer $bo$, we normalize each underlying incentive variable to have mean zero and unit variance, then average across the four variables to form a composite index $Incentive_{bo}$, and analogously for the selection index $Selection_{bo}$ (recoding corruption and nepotism so that higher values indicate 'positive' selection).

We construct a binned scatterplot using the following OLS specification:

$$Selection_{bo} = \beta Incentive_{bo} + \delta_b + \epsilon_{bo}. \tag{5}$$

As in equation (4), we include borough fixed effects and cluster standard errors at the borough level.[24] We classify each bin as 'unpaid' or 'paid' based on whether the share of unpaid officers exceeds the population share of unpaid officers.

Figure 6 shows results. The x-axis plots the incentive index, and the y-axis the selection index. Vertical and horizontal lines indicate the respective conditional means. Majority-unpaid bins are represented by blue circles, while red diamonds denote majority-paid bins. We adjust the size of each bin to reflect the number of underlying observations.

The figure shows a strong positive relationship between incentives and selection: nearly all bins fall in either the top-right or bottom-left quadrants. Furthermore, the unpaid–paid classification aligns with this structure: majority-unpaid bins are concentrated in the top-right quadrant, and majority-paid bins in the bottom-left. Thus, unpaid status, above-average incentives and selection systematically co-occur. This suggests strong complementarities between incentives and selection in the keeping of unpaid officers.

## 6.2 Incentives and Selection Across Tasks

Figure 6 documents strong co-movement of incentives and selection at the officer level. A natural next question is whether similar patterns exist across tasks — i.e., whether certain tasks are systematically associated with strong incentives and selection, while others are not.

To investigate this, we disaggregate unpaid status, incentives, and selection margins by task. For

[24] Our baseline specification uses 30 bins. Appendix Figure D.1 shows robustness to varying the number of bins $10, 20, 30, 40$. Appendix Table D.1 reports the results of the unbinned regression in equation (5).

each officer $bo$ and fixed task $\dot{t}$, we define an indicator $w_{bo\dot{t}}$ equal to one if the officer is assigned to task $\dot{t}$. We then estimate the association between this task assignment and various officer characteristics $c_{bo}$ (including unpaid status, incentives, and selection indices) using the following linear model, estimated separately for each task and characteristic:

$$w_{bo\dot{t}} = \beta_0 + \beta_1 c_{bo} + \epsilon_{bo}. \tag{6}$$

The coefficient $\beta_1$ captures the extent to which officers with characteristic $c_{bo}$ are disproportionately involved in task $t$.

We begin by examining heterogeneity in unpaid status across tasks. Panel A of Figure 7 presents estimates of equation (6) with $c_{bo} = Unpaid_{bo}$. Tasks are ordered by the magnitude of the estimated coefficients. The results document substantial variation: tasks such as governing and administering justice are disproportionately staffed by unpaid officers, while clerical work, gaol-keeping, and policing are more likely to be performed by paid officials.

Next, we assess whether the co-movement of incentives and selection documented in Figure 6 also appears across tasks. Specifically, we test whether tasks with a higher prevalence of unpaid officers are systematically associated with stronger non-monetary incentives and selection margins. To this end, we re-estimate equation (6) for each incentive and selection variable $c_{bo}$, maintaining the task ordering from Panel A to facilitate comparison.

Panel B considers variation in incentive structures. The first figure reports results for prestige. Tasks such as governing and justice score high on prestige, while gaol-keeping and policing score low. The downward slope in the coefficients — mirroring Panel A — indicates that prestige and unpaid status co-move across tasks. This pattern is consistent with the notion of substitutability between monetary and non-monetary rewards: tasks with greater intrinsic or reputational rewards can attract officers even in the absence of pay.

Similar patterns hold for other incentive measures. We observe analogous downward-sloping gradients for career concerns, flexibility, and autonomy. In each case, tasks with higher levels of these non-monetary incentives also exhibit higher shares of unpaid officers.

# 7 Conclusion

What explains the large variation in the performance of government around the world? Most contributions focus on the organization and staffing of the salaried public administration (Besley et al., 2022; Finan et al., 2017). In this paper we identify another dimension of government: the unsalaried individuals who perform tasks that today would be executed by salaried bureaucrats. The state extends, as it were, into society and is embedded in society.

We characterize the incentives that sustain the Embedded State in the context of early modern government in England. England's central, salaried government was small relative to all the mayors, justices of the peace, town clerks, and overseers of the poor that ran the judicial system, built roads, repaired churches, resolved disputes, and presided over town and village meetings. We also study who takes up unpaid jobs and find that a particular layer of society, made up of those with a cultural affinity for public service, self-selects into unpaid public service. They take advantage of the opportunities that an office affords, which range from career opportunities to opportunities for self-enrichment and nepotism, while dedicating their time to public service.

When we compare paid to unpaid officers, we find that unpaid officers outperform paid officers in terms of public good provision. This result is in part driven by the fact that the individuals who self-select into unpaid public office are from the higher layers of society.

The fact that unpaid officers are positively selected may explain why the Embedded State, which originally took shape during the late middle ages, survived until the end of the nineteenth century.

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Figure 1: Local Organizational Units




Panel A: Parish Panel B: Borough Panel C: County

**Note:** Panels map the three tiers of local government in England. Panel A plots all parishes in England and Wales, using GIS data from Kain and Oliver (2001). Panel B plots all towns in the same region, with the sample surveyed in the Municipal Corporations report in dark gray. Panel C shows county boundaries.

Figure 2: East Looe Officer List

**Recorder.** The Recorder is appointed by the mayor and capital burgesses, being the common council of the borough, or the major part of them. He holds his office so long as he shall well behave himself. He is required by the charter to be an able, honest and fit person. He is a justice of the peace for the borough, and may appoint a deputy who is also a justice of the peace. It has not been usual to appoint a barrister to the office, which has, in fact, been generally bestowed upon the patron of the borough, or some one nominated by him. The following is a list of the recorders, since the year 1754:

1754: The Rev. J. Buller.
1786: The Rev. W. Buller.
1797: Dr. W. Buller, bishop of Exeter.
1797: William Graves, esq.
1802: Edward Buller, esq.
1802: John Buller, esq.
1807: Edward Buller, esq.

The present recorder is John Drummond Buller Elphinstone, esq. He resides in Hertfordshire, and was formerly an officer in the guards. His age is between 40 and 50. He formerly resided near the borough, and was then in the habit of sitting as a magistrate.

The deputy recorder is Thomas Hope, esq. He resides at Trenant Park, near Looe, and in Duchess-street, London. He was appointed on the 29th September 1830. He has not since his appointment performed the usual duties of his office.

**Town Clerk.** The Town Clerk or Common Clerk of the courts within the borough is nominated by the recorder; he is clerk of the peace, clerk to the magistrates, and solicitor to the corporation; he receives a salary of 15*l.* per annum, and the other emoluments of his office do not exceed 20*l.* The present town clerk is Mr. William Tickell, solicitor, aged 44; he has filled the office for seven or eight years.

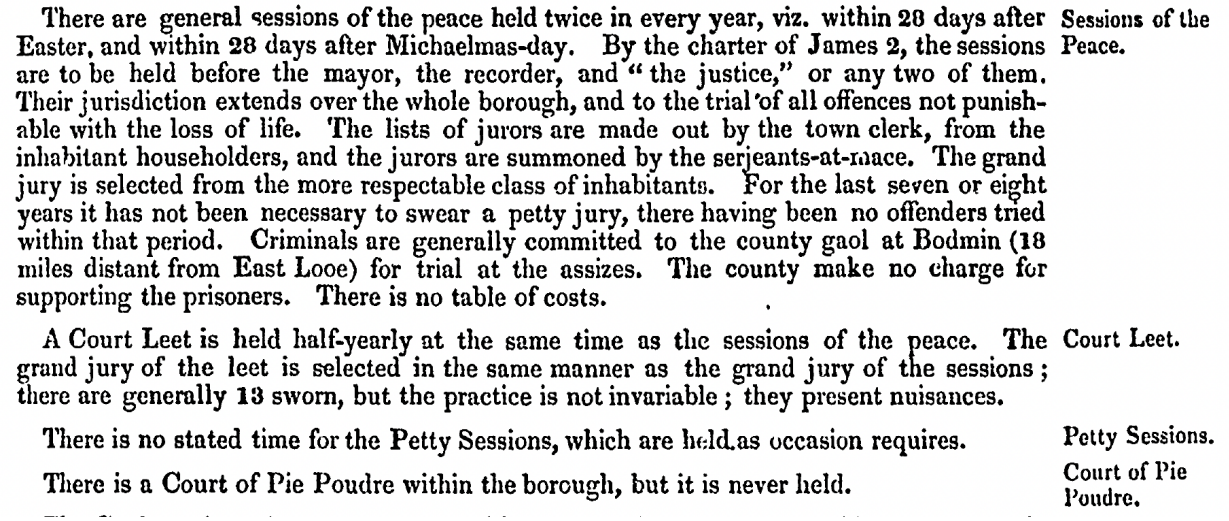
**Serjeants at Mace.** There are two Serjeants-at-Mace for the execution of precepts, mandates, attachments, and other process within the borough; they also attend upon the mayor; they receive a stipend of 2*l.* 6*s.* 6*d.* each in lieu of cloaks and hats.

**Constables.** There are nine Constables; they are appointed by the court leet.

**Quay Master.** The Quay Master is appointed by the corporation; he collects the quay dues and ballast dues, and has the general superintendence of the quays; he also collects the market dues; he receives a salary of 10*l.* per annum.

**Note:** Figure presents an example officer list from the municipal report chapter on East Looe. Officers' method of appointment is highlighted in gray; task assignments in yellow; and remuneration in turquoise.

Figure 3: East Looe Courts



There are general sessions of the peace held twice in every year, viz. within 28 days after Easter, and within 28 days after Michaelmas-day. By the charter of James 2, the sessions are to be held before the mayor, the recorder, and "the justice," or any two of them. Their jurisdiction extends over the whole borough, and to the trial of all offences not punishable with the loss of life. The lists of jurors are made out by the town clerk, from the inhabitant householders, and the jurors are summoned by the serjeants-at-mace. The grand jury is selected from the more respectable class of inhabitants. For the last seven or eight years it has not been necessary to swear a petty jury, there having been no offenders tried within that period. Criminals are generally committed to the county gaol at Bodmin (18 miles distant from East Looe) for trial at the assizes. The county make no charge for supporting the prisoners. There is no table of costs.

Sessions of the Peace.

A Court Leet is held half-yearly at the same time as the sessions of the peace. The grand jury of the leet is selected in the same manner as the grand jury of the sessions; there are generally 13 sworn, but the practice is not invariable; they present nuisances.

Court Leet.

There is no stated time for the Petty Sessions, which are held as occasion requires.

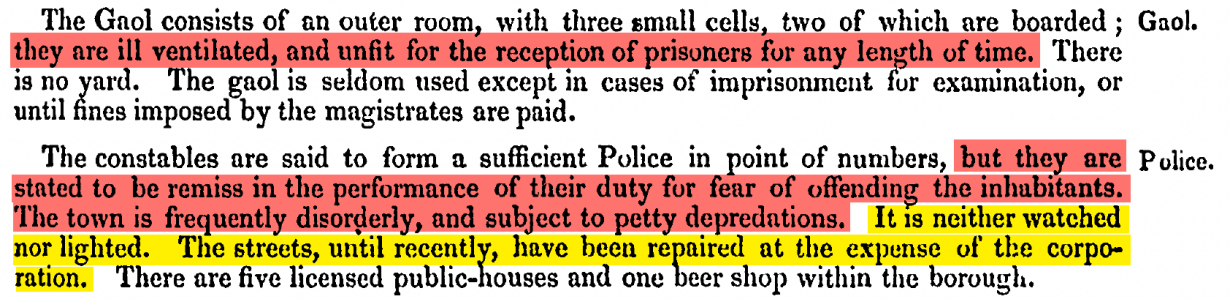
Petty Sessions.

There is a Court of Pie Poudre within the borough, but it is never held.

Court of Pie Poudre.

**Note:** Figure presents the list of courts in East Looe. Here, the Sessions of the Peace (quarter sessions), Court Leet, and Petty Sessions are active, while the Court of Pie Poudre is defunct.

Figure 4: East Looe Performance



The Gaol consists of an outer room, with three small cells, two of which are boarded; they are ill ventilated, and unfit for the reception of prisoners for any length of time. There is no yard. The gaol is seldom used except in cases of imprisonment for examination, or until fines imposed by the magistrates are paid.

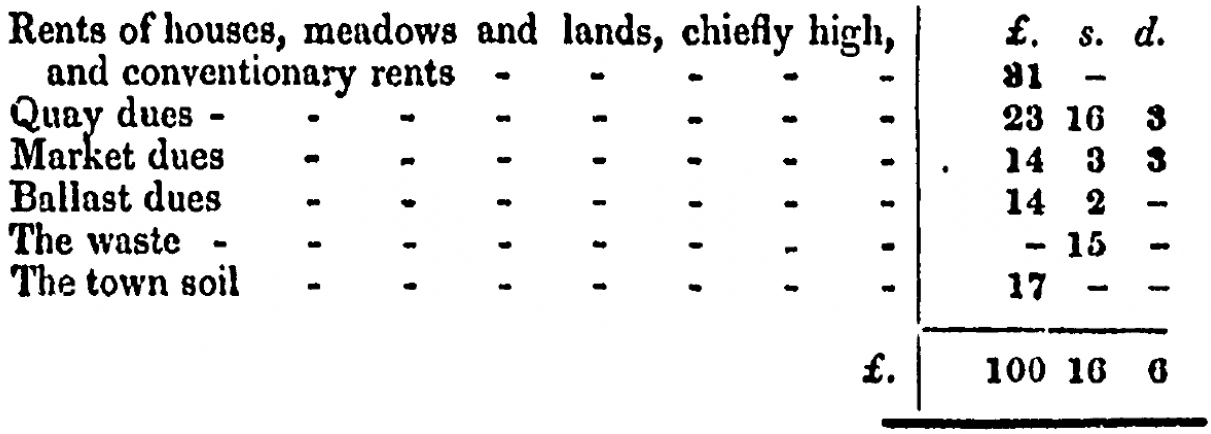
Gaol.

The constables are said to form a sufficient Police in point of numbers, but they are stated to be remiss in the performance of their duty for fear of offending the inhabitants. The town is frequently disorderly, and subject to petty depredations. It is neither watched nor lighted. The streets, until recently, have been repaired at the expense of the corporation. There are five licensed public-houses and one beer shop within the borough.

Police.

**Note:** This figure discusses the performance of three local public goods in East Looe: the prison, the police, and infrastructure. The former two are highlighted in red, the latter in yellow. The gaol is inadequate for holding prisoners. The police are also unable to keep public order. For infrastructure, the streets are paved but not lit.

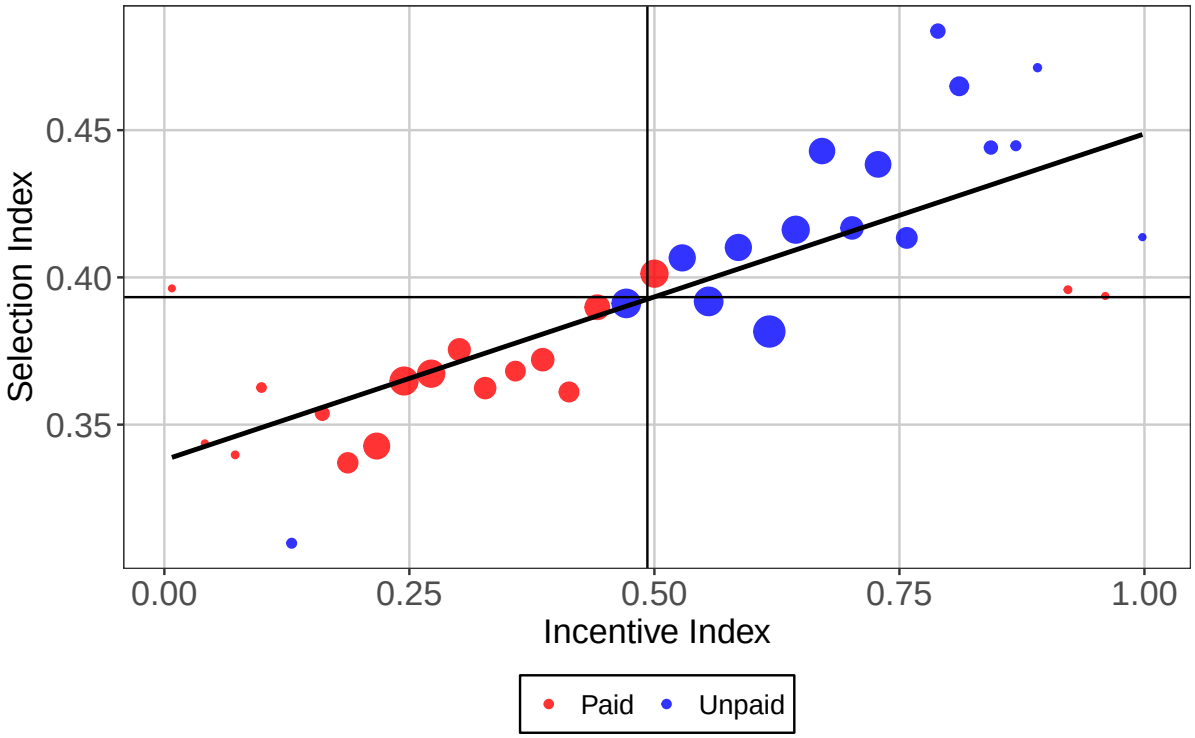
Figure 5: East Looe Accounts



| | £. | s. | d. |
|---|---|---|---|
| Rents of houses, meadows and lands, chiefly high, and conventionary rents | 31 | – | |
| Quay dues | 23 | 16 | 3 |
| Market dues | 14 | 3 | 3 |
| Ballast dues | 14 | 2 | – |
| The waste | – | 15 | – |
| The town soil | 17 | – | – |
| £. | 100 | 16 | 6 |

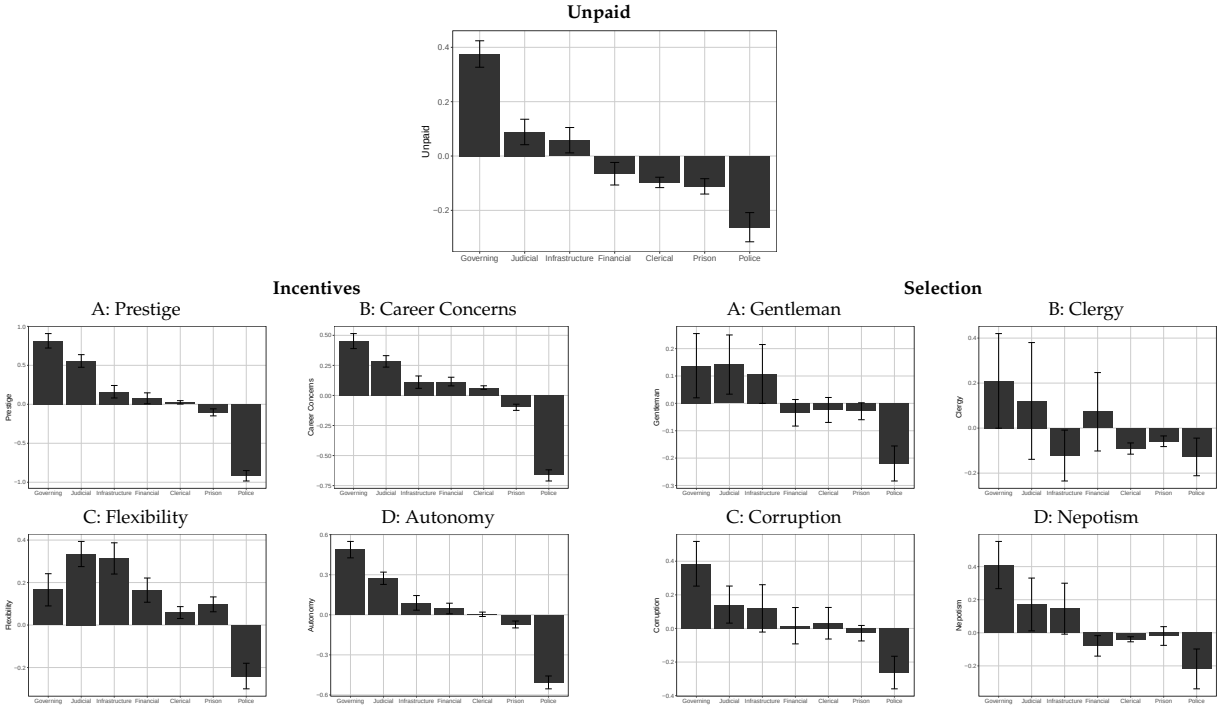
**Note:** Figure presents line-by-line *revenue* accounts for East Looe (expenditures not pictured). As was common, rents on property were the largest source of corporate income, but the town was also able to tax maritime trade.

Figure 6: The Embedded State Within Boroughs



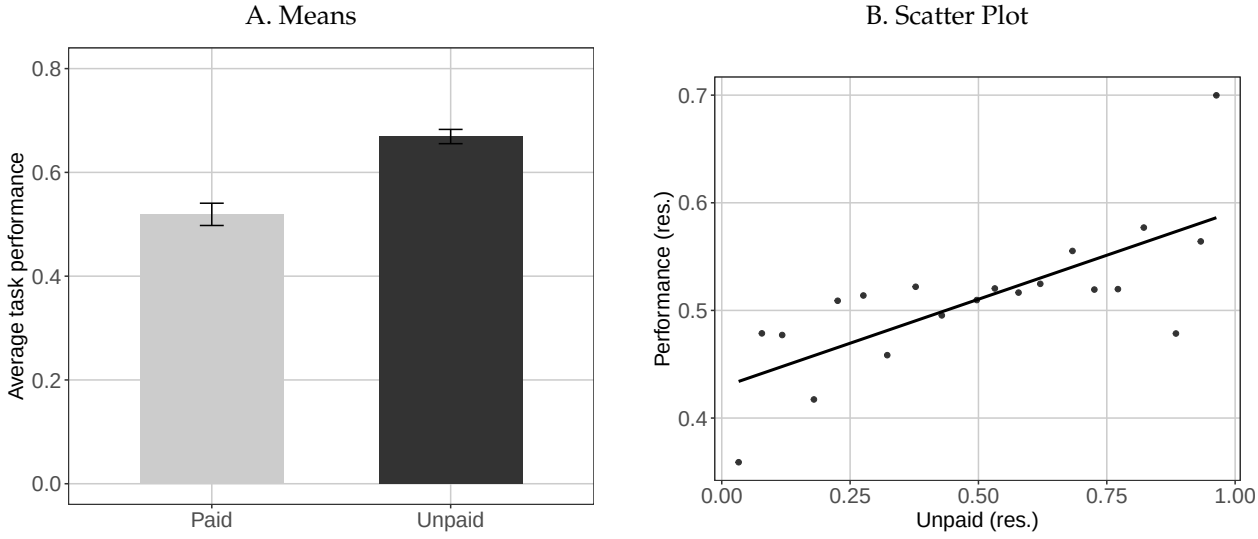

**Note:** The figure presents results of estimating equation (5) in a binned scatterplot. The x-axis plots the incentive index, and the y-axis the selection index introduced in Section 5. Vertical and horizontal lines indicate the respective conditional means. Majority-unpaid bins are represented by blue circles, while red diamonds denote majority-paid bins. We adjust the size of each bin to reflect the number of underlying observations. Observations are at the level of an officer. The sample comprises of 6,558 officers.

Figure 7: The Embedded State Across Tasks



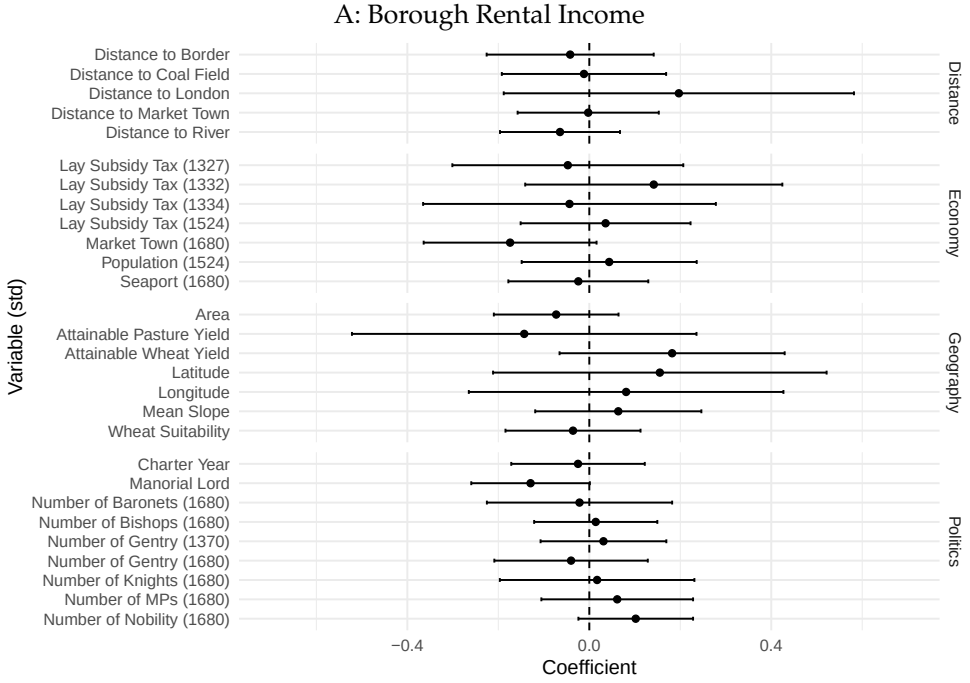

**Note:** The figure presents results of estimating equation (6), with 95 percent confidence intervals. Observations are at the level of an officer. The sample comprises of 6,558 officers. Standard errors are clustered at the borough level. The dependent variables are the incentive and selection measures introduced in Section 5.

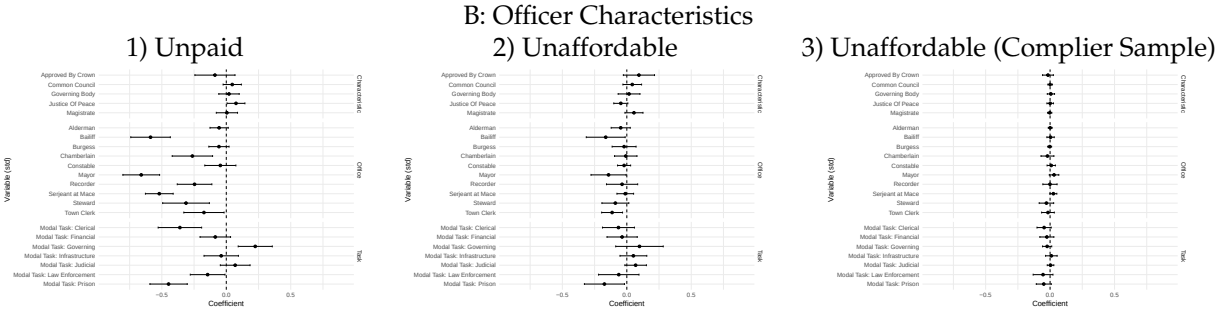
Figure 8: Officer Performance and Paid Status




**Note:** This plot shows (Panel A) officer-level performance averages separately for paid and unpaid officers, with 95 percent confidence intervals, and (Panel B) results of estimating the relationship between unpaid status and performance after residualizing performance with respect to borough fixed effects. The horizontal axis reports the officer-level predicted probability of being unpaid (i.e., unpaid propensity), while the vertical axis shows residualized performance, in a binned scatterplot. Observations are at the level of an officer. The sample comprises of 6,558 officers. The dependent variable is the mean performance across all tasks to which an officer is assigned, as introduced in Section 4.

Figure 9: Borough Characteristics and Rental Income




**Note:** The figure presents results of estimating equation (2) (Panel A) and (3) (Panel B) with 95 percent confidence intervals. Observations are at the level of a borough (Panel A) or an officer (Panel B.) The sample comprises of 258 boroughs and 6,558 officers (3,911 in the complier sample). The dependent variable is standardized borough rental income (Panel A) or unpaid/unaffordable status (Panel B). Standard errors are clustered at the borough level.

Table 1: Comparing the Central and Local State: Size and Paid Status

| | Total size | | % Male pop. | | % Unpaid |
|---|---|---|---|---|---|
| | **1700** | **1835** | **1700** | **1835** | **1835** |
| Central | 4,920 | 21,305 | 0.33 | 0.63 | 0.00 |
| Parish | 50,000 | 95,520 | 3.33 | 2.81 | 100.00 |
| County | 25,084 | 40,994 | 1.65 | 1.20 | 90.30 |
| Borough | 7,660 | 12,268 | 0.51 | 0.36 | 70.69 |
| Borough (our sample) | — | 5,095 | — | 0.15 | 85.42 |
| **Total (Local)** | 82,744 | 148,782 | 5.52 | 4.38 | 94.91 |

**Note:** Columns show totals and shares of adult male population for central and local government officers in 1700 and 1835, and the share of local officials who were unpaid in 1835. Central government figures are from Brewer (1989) (1700) and Cook and Keith (1975) (1835). Local government data draw on Goldie (2001), Landau (1984), and original data collected for this project. Percent male population = total divided by adult male population. Total (Local) sums rows 2–4.

Table 2: Common Offices and Tasks by Borough

| Borough | Population | # Officers | Share Unpaid | Most Common Office | Most Common Task |
|---|---|---|---|---|---|
| Liverpool | 165,175 | 203 | 0.07 | watchman | law enforcement |
| Leeds | 123,393 | 121 | 0.31 | watchman | law enforcement |
| Norwich | 61,096 | 176 | 0.49 | common councilman | infrastructure |
| Bristol | 59,034 | 338 | 0.38 | constable | law enforcement |
| Nottingham | 50,220 | 119 | 0.03 | constable | law enforcement |
| … | … | … | … | … | … |
| Caerwys | 500 | 1 | 1.00 | recorder | judicial |
| Fordwich | 487 | 8 | 1.00 | borsholder | law enforcement |
| Kenfig | 487 | 2 | 0.00 | portreeve | clerical |
| Dunwich | 232 | 31 | 0.97 | common councilman | judicial |
| Newtown | 68 | 3 | 1.00 | clerk | financial corporation |

**Note:** Table offers summary statistics for the five largest and smallest boroughs in our sample. The most common office is the one with the largest employment in the borough; the most common task is the one performed by the most individual officers (rather than offices/job titles).

Table 3: Office Descriptives

| Office | # Boroughs | # Officers | Share Unpaid | Avg Tasks | Most Common Task |
|---|---|---|---|---|---|
| Constable | 226 | 1228 | 0.70 | 1.13 | Law Enforcement |
| Town clerk | 195 | 204 | 0.40 | 3.27 | Clerical |
| Serjeant at mace | 187 | 397 | 0.23 | 2.70 | Law Enforcement |
| Recorder | 186 | 224 | 0.64 | 1.53 | Judicial |
| Mayor | 182 | 202 | 0.53 | 3.20 | Judicial |
| … | … | … | … | … | … |
| Assessor | 2 | 6 | 0.17 | 0.83 | Infrastructure |
| Bridgeman | 2 | 4 | 1.00 | 0.50 | Financial Corp. |
| Brother | 2 | 20 | 1.00 | 0.30 | Governing |
| Catcher | 2 | 2 | 0.50 | 2.00 | Clerical |
| Claviger | 2 | 4 | 1.00 | 1.00 | Clerical |

**Note:** Table describes the five most and least common (defined by the number of boroughs where present) offices that perform any *relevant* tasks in our dataset. 'Most common task' is weighted by the number of officers — effectively the task done by the most individuals with that job title.

Table 4: Unpaid and Performance

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.10*** | 0.12*** | 0.13*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.28 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table 5: Unaffordable and Performance

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Officer on Team | 0.18*** | 0.17*** | 0.17*** |
| | (0.04) | (0.04) | (0.04) |
| Observations | 23,996 | 23,996 | 23,996 |
| $R^2$ | 0.28 | 0.35 | 0.35 |
| Boroughs | 207 | 207 | 207 |
| Officers | 3,428 | 3,428 | 3,428 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.62 | 0.62 | 0.62 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$ and subsetting to 3,911 complier officers. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table 6: Officer Incentives

| | External | | Internal | |
|---|---|---|---|---|
| | Prestige | Career Concerns | Flexibility | Autonomy |
| | (1) | (2) | (3) | (4) |
| Unpaid | 0.18*** | 0.30*** | 0.10*** | 0.23*** |
| | (0.02) | (0.03) | (0.03) | (0.03) |
| Observations | 5,693 | 5,693 | 5,693 | 5,693 |
| $R^2$ | 0.20 | 0.23 | 0.24 | 0.28 |
| Boroughs | 258 | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 | 5,693 |
| Outcome Mean | 0.46 | 0.54 | 0.31 | 0.52 |
| Cluster | Borough | Borough | Borough | Borough |
| Borough fixed effects | ✓ | ✓ | ✓ | ✓ |

**Note:** The table presents results of estimating equation (4). Observations are at the level of an officer. The number of officers in each sample is indicated in the table. Standard errors are clustered at the borough level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variables are the incentive measures introduced in Section 5.

Table 7: Officer Selection

| | Advantageous | | Adverse | |
|---|---|---|---|---|
| | Gentleman | Clergy | Corruption | Nepotism |
| | (1) | (2) | (3) | (4) |
| Unpaid | 0.14** | 0.02*** | 0.06*** | 0.06*** |
| | (0.06) | (0.007) | (0.02) | (0.02) |
| Observations | 1,604 | 1,604 | 5,693 | 5,693 |
| $R^2$ | 0.45 | 0.21 | 0.32 | 0.55 |
| Boroughs | 162 | 162 | 258 | 258 |
| Officers | 1,604 | 1,604 | 5,693 | 5,693 |
| Outcome Mean | 0.42 | 0.02 | 0.07 | 0.06 |
| Cluster | Borough | Borough | Borough | Borough |
| Borough fixed effects | ✓ | ✓ | ✓ | ✓ |

**Note:** The table presents results of estimating equation (4). Observations are at the level of an officer. The number of officers in each sample is indicated in the table. Standard errors are clustered at the borough level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variables are the selection measures introduced in Section 5.

# Supplementary Appendix: For Online Publication

# A The Local State: Details

## A.1 Estimating the Size and Remuneration of the State

The central state was mostly confined to London, and managed the military, foreign policy, and raised several direct taxes, most centrally dues in ports, and the excise tax on consumption. To raise taxes, it employed a rotating corps of excise officials in the countryside. The central state expanded over the course of the eighteenth and nineteenth century from about 5,000 people in 1700 to about 21,000 in 1835. This development has been described in detail by Brewer (1989). The comparatively small number of bureaucrats has led some to comment that the English government was laissez-faire, and did not touch the lives of ordinary people (Hanlon, 2024). It is true that the central state essentially did not interfere in individuals' lives at all (on this see also Collinson (1994), especially p. 17). Yet the state did reach everyone, it is just that the legal system, property rights protection, and public good provision, were all organized by the local government.

The local government in England consisted of three main layers. Below the central government, there were 52 counties, and about 10,000 parishes. In between the counties and the parishes were cities and towns, which had various degrees of self-governance. Since we analyze a sample of towns in more detail, in the next subsection we discuss self-governance in more detail. We now attempt to characterize the size of the local state.

It is hard to measure the number of individuals who were part of the local state. This is fundamentally because most individuals who held an official position in a parish, borough, or county did not get paid. They were not registered with any central government institution, nor were they supervised by the central state. The fact that most were unpaid means that they were 'off the books' from the perspective of London, and their appointment was recorded in vestry proceedings and borough council meeting notes, which were often not kept or didn't survive.

Below, we bring together the available data and reconstructions by historians to arrive at an estimate of the size of the local state, following a similar exercise by Goldie (2001). The result is in Table 1 in the paper. The first two columns provide the number of public employees in levels, and the second two columns normalize by the adult male population. The last column contains an estimate of the fraction of employees who were paid. The first row provides, as a comparison, the size of the central state, which we discussed before. In 1700, the central state employed 4,920 individuals (0.33% of the adult male population), all of whom got paid. By 1835, this number increases to 21,305 (0.66% of the adult male population), which is

close to the standard estimate in Brewer (1989).

In the next three rows we estimate the size of the local state. We start with the lowest level, the parish, which we map in panel A of Figure 1. At the parish level, there were several offices that were yearly rotated between the inhabitants of the parish. For example, parishes had usually two overseers of the poor who were responsible for social security under the Elizabethan Poor Laws. In addition they had officers like the Churchwarden and the constable, who were responsible for law enforcement. For a brilliant treatment of parish governance, see Tate (1969). We estimate that the total number of individuals who had such recognized jobs at the parish level was equal to about three percent of the population. This means that in 1700 there were about 50,000 individuals who executed government tasks at the parish level, and by 1835 this number had grown to about 95 thousand. Interestingly, none of these officers got paid. Some were allowed to collect some fees, the constable for example was sometimes allowed to collect a fee for law enforcement (Kent, 1981). Yet the vast majority of officers had a day job and performed their government functions in addition to their regular source of income.

The next level of government is the borough or town. We map towns in panel B of Figure 1. It is not clear what defines a town relative to a large village. We discuss this issue in the next section. What is clear, however, is that there were cities that were chartered as cities, and large cities, such as Birmingham, that were never chartered but that were obviously cities. We use a definition based on an urban indication available in the 1841 census to define what a city is; details are in the Appendix. At the city level, there were a myriad government positions because cities were at liberty to structure their own governance. Table 2 describes the employment of the five largest and smallest towns in our dataset. Populous cities like Liverpool and Leeds might employ hundreds of officers, mostly unpaid, though with wide variation in both categories. Liverpool, more than twice the population of Norwich, employed a similar number of officers. Liverpool paid nearly all of officers, while Norwich paid only half of its own. Gomme (1879) provides a detailed overview and discussion of city officers. Table 3 lists the most and least common offices in our sample. While there is a lot of diversity, most boroughs have a person in charge of the borough, often called a Mayor or Headborough. Typically, they employed someone to keep records, and sometimes officers to keep order. Most boroughs had at least one constable or watchman, and the largest might employ over a hundred. Since our main dataset consists of borough officers, we return to borough government in the next section. According to our calculations, borough government grew from about 7,660 individuals in 1700 to about 12 thousand individuals in 1835. Most borough officers were also unpaid: we estimate that about 71% did not get a salary.

The final level of local government is the county.[1] We map counties in panel C of Figure 1. At the

[1]Other levels of government did historically, and contemporaneously, exist in the nineteenth century. These include the hun-

county level, governance was less dense than at the lower levels of government. The key government task that was executed at the county level was law enforcement. The most common officers at this tier of government were the Sheriffs and the Justices of the Peace. The last common officer was the militia officer, responsible for military recruitment. Formally, the county was headed by a Lord Lieutenant of the county. Importantly, at the county level, too, most officers were unpaid. We estimate that there were 25,000 officers at the county level in 1700 and that this grew to about 41,000 by 1835. 90% of them did not get a wage.

In total, local government amounted to *at least* 148,000 individuals in 1835. Of these, nearly 95% did not receive a salary. This is the main reason why this fact is not widely discussed in the literature on the development of the English state (e.g., in Brewer (1989)). These officers were appointed at the local level and neither supervised nor paid by London. The number of unpaid officers is about 7 times the size of the paid bureaucracy.[2]

## A.2 Estimation Details

In section, we explain our rough estimates of the size of the English local state in 1700 and 1835, building on work by Goldie (2001, pp. 161-62) with original data from this project. We then make comparisons with the size of the central 'Weberian' administration using data on government bureaucrats in 1708 and 1832 from Brewer (1989) and Cook and Keith (1975). No exact tabulations of local officeholders were made in 1835, let alone 1700, so producing even imprecise figures for each year requires investigation of each of the three major tiers of local government:

1. County officials
2. Parish officials
3. Borough officials

dreds, which were a level in between counties and parishes. Other units includes sokes and wapentakes in different counties, hamlets and townships below parishes, and some units within cities, such as the city of London within London itself. Since these mostly did not tend systematically employ individuals, we do not include them here. Similarly, there were medieval manorial courts, called 'courts leet, which appointed individuals. These were especially prominent in parish government, where officers such as the pinder, the hayward, or the hogringer were appointed by manorial courts. Some officers in boroughs were also appointed by manorial courts, if a manorial court was still relevant for that borough. We do not code such manorial officers, because no systematic data exist. For the history of these units see Webb and Webb (1963), and for a case study of an individual parish that discusses manorial officers see Trotter (1919).

[2]Our estimate of the size of local government is an underestimate. This is so for two reasons. First, there was a diffuse array of officers that were appointed by the surviving manor courts, or courts leet, at the parish and town level. For example, these courts would appoint individuals to check the quality of agricultural output (*aleconners*, for example) or round up stray animals (the pinder). We omit these from our calculations because they didn't exist everywhere and their number is uncertain. Second, Goldie (2001) points out that most unpaid officers rotated yearly, whereas most salaried officers had longer tenure times. In Appendix Section A.3, we account for this turnover and find that over 27.6% of the male population may have held some local office in any given decade during the early nineteenth century.

We discuss each category in turn.

**County Government**

Goldie (2001, p. 162) offers rough figures for three main categories of county-level officials, offering Rudolf van Gneist's estimates for these totals in 1800: "In addition, he reckoned 10,000 assize and quarter sessions jurors at each sitting, 8,000 militia officers and 3,800 active JPs."

From Landau (1984, pp. 367-73), we can improve on the number of JPs for 1670-1761; these totals are listed in Table A.1. Note that these constitute the number of members of the Commission of the Peace, not necessarily active JPs. The number for 1829 comes from House of Commons (1829).

| Year | 1670 | 1702 | 1761 | 1829 |
|---|---|---|---|---|
| JPs | 2570 | 3700 | 8478 | 19610 |

Table A.1: JP counts across England and Wales (Landau, 1984, pp. 367-72).

van Gneist conjectured that there were 8,000 militia officers in 1800; an 1828 Parliamentary report gives a total of 5,781 officers and 50,888 privates (House of Commons, 1828). This figure seems difficult to improve upon for 1700.

As for assize and quarter sessions jurors, there were 212,335 men *eligible* to serve on juries in 1835, but we do not know the actual number serving (House of Commons, 1836). For the present, then, we assume that van Gneist's total of 10,000 was static across both years.

On top of JPs, militia officers, and jurors, there were a litany of smaller offices.

- **High Constables (unpaid):** There was nominally one high constable per hundred or equivalent, and there were roughly 1,438 hundreds in England and Wales in both 1700 and 1835. We consequently take 1,438 to be the total across all counties.
- **Sheriff (unpaid):** There was one sheriff for each of the 52 counties in England and Wales.
- **Coroner (unpaid):** A Parliamentary report for 1839 found that there were 148 county coroners for England and Wales (House of Commons, 1840).
- **Custos Rotulorum (paid):** 52 — one per county

- **Lord Lieutenant (paid):** 52 — one per county. The offices of Lord Lieutenant and Custos Rotulorum were unified in 1836, but at the time of the Municipal Corporations report, they were at least nominally distinct.
- **Militia Staff officers (paid):** According to a 1828 Parliamentary report, there were 2,841 militia staff in that year. This category encompasses the quartermaster, paymaster, surgeon, adjutant, and others (House of Commons, 1828).
- **Clerk of the Peace (paid):** There appears to have been one clerk of the peace per county quarter sessions.
- **Gaol Keeper (paid):** There were 968 prison staff, essentially all paid, working in county gaols and houses of correction in 1833. Common offices include the gaoler, turnkey, matron, and chaplain (House of Commons, 1833).

We make the unrealistic assumption (for lack of an alternative) that the local state did not grow between 1700 and 1835 in all categories for which we do not have prior data. Summing up, therefore, we have 25,084 county officers in 1700 and 40,994 in 1835, of which 84.2 and 90.3 percent, respectively, were paid. The former figure is almost certainly too low, because it seems probable that the paid prison establishment was significantly smaller in 1700.

**Parish Government**

Goldie (2001, pp. 161-62) offers the following estimate for the number of parish officers in 1700 and 1800: "In the seventeenth century, there were approximately 9,700 parishes in England and Wales. If each had one constable, two churchwardens, and two overseers, then we have a total of around 50,000 parish officers at any one time. Thus, around the year 1700, about one-twentieth of adult males were governing in any year; in principle, that might mean one-half were governing in any decade.

Rudolf van Gneist estimated that around the year 1800, there were 14,000 parishes and townships annually choosing at least one constable, one surveyor, two churchwardens, and two overseers, so that perhaps 100,000 people held office."

For 1700, we take Goldie's suggested five officers and roughly 10,000 ancient parishes to be our baseline. For 1835, assuming each parish had approximately six officers, we need only calculate the number of

parishes in that year and multiply the two figures. In the 1831 census, there were around 15,920 parishes in England and Wales. These figures give us the total number of officers for that year as follows:

**Estimate for 1835:**

$$\text{15,920 parishes} \times 6 \,\text{officers} = 95,520 \,\text{parish officers in any year}$$

This estimate is almost certainly a lower bound because many parishes also had such offices as the clerk, beadle, sexton, scavenger, reeve, hayward, and pinder. Additionally, there may have been more of the statutory four offices described above—e.g. two surveyors of highways or up to four overseers of the poor. We assume, for lack of data, that parish officers were uniformly unpaid, though it seems plausible that some would have been remunerated through fees or in-kind payments, even if salaries were uncommon.

**Borough Government**

We have the number of officers for 277 municipal boroughs. These boroughs, however, represent only a subset of the 1,050 towns in recorded in the 1841 census. Urban governance was patchy at best outside of the chartered corporations, historically a mix of parish and manorial officers, though some expanding industrial towns passed Local Acts establishing commissions for policing and sanitation. Manchester (more populous than any municipal borough in 1841), for example, was governed by a manorial court leet, which appointed a boroughreeve and constables to enforce its bylaws. These officers were supplemented in 1792 under a Local Act that enabled the raising of a police rate to fund lighting, paving, cleansing, drainage, street widening, and the night watch.

To estimate the aggregate size of urban government in England and Wales, we match our boroughs to population data for all towns in the late seventeenth century from Bennett (2012). For 1835, we use town populations from the 1841 census. We then crudely predict the number of officers in each town outside our sample based solely on population. To account for the lower intensity of governance outside our sample, we assume that towns smaller than the median municipal borough in 1841 had no officers (outside of parish officials), and that non-municipal boroughs smaller than the median 1841 municipal population had 50% of the predicted number of officers. For 1835, we combine the actual numbers of officers from the 277 boroughs in our sample with the predictions for the remaining above our median sample size. The numbers for 1700 are all predicted from the late seventeenth-century population figures.

From this exercise, we get:

- **1700**: ∼7,659 municipal officers
- **1835**: ∼12,267 municipal officers

These estimates are probably conservative, but as a lower bound, one could consider just the officers employed in municipal boroughs whose tasks we directly observe. This comes out to 5,095 officers, which we get directly from the municipal report.

## Summing Up:

Adding together the county, parish, and borough government tiers, we get the following totals for 1700 and 1835:

- **1700**: 7,659 borough + 50,000 parish + 25,084 county = 82,743
- **1835**: 12,267 borough + 95,520 parish + 40,994 county = 148,781

#### Central Bureaucratic State

We know from Brewer (1989) that about 4,920 paid central officials were employed in 1708 across the military and fiscal bureaucracies (especially excise and customs). For the early nineteenth century, we have Table A.2 from Cook and Keith (1975, p. 150), which gives us 21,305 paid civil servants in 1832.

Table A.2: British Civil Service employment, 1797–1914

| Year | Civil Service employment | Per thousand population | Notes |
|---|---|---|---|
| 1797 | 16,267 | 1.83 | |
| 1815 | 24,598 | 2.42 | |
| 1821 | 27,000 | 2.25 | |
| 1832 | 21,305 | 1.53 | |
| 1841 | 16,750 | 1.05 | (excludes clerks, messengers, etc.) |
| 1851 | 39,147 | 2.18 | |
| 1861 | 31,943 | 1.59 | |
| 1871 | 53,874 | 2.37 | (includes some workmen) |
| 1881 | 50,859 | 1.96 | (excludes telegraph, telephone services) |
| 1891 | 79,241 | 2.73 | |
| 1901 | 116,413 | 3.58 | (includes General Post Office) |
| 1914 | 280,000 | 6.86 | (includes Scotland) |

*Sources:* Table 3.1 from Hanlon (2024). Original civil service employment data from Cook and Keith (1975, p. 150); population data from Mitchell & Deane (1962), corresponding to England and Wales except in 1914, which includes Scotland.

**Summary Table**

Table A.3 below combines our estimates of the numbers of central and local officials employed in any single year. We are excluding for both years A) the rank-and-file of the militia and B) the entirety of the regular army and navy, though we do retain clerks in the military establishment.

In both years, local government dwarfs Whitehall—by nearly 17 times in 1700, and by seven times even after the eighteenth-century expansion of the English fiscal state documented by Brewer (1989) and others.

To get a sense of the relative scale of the relational state, we divide our totals by the size of the male population of England and Wales in each benchmark year. There is no exact data for 1700, a century before the first census, but If we go off Wrigley et al. (1997) and Keibek (2017) suggest that the actual total was likely around 1.5 million (not the 1 million used by Goldie). There were 3,394,638 adult males reported in the 1831 census. We then represent each category of local (as well as central) government as a share of the adult male population in 1700 and 1835 in columns three and four.

| **Category** | **Total** | | **% male pop.** | |
|---|---|---|---|---|
| | **1700** | **1835** | **1700** | **1835** |
| Central | 4,920 | 21,305 | 0.33 | 0.63 |
| Parish | 50,000 | 95,520 | 3.33 | 2.81 |
| County | 25,084 | 40,994 | 1.67 | 1.21 |
| Borough | 7,660 | 12,268 | 0.51 | 0.36 |
| **Total (Local)** | 82,744 | 148,782 | 5.52 | 4.38 |

Table A.3: Total numbers and population shares of central and local officers in 1700 and 1835 (% male population = total/adult male population in year $t$). Total Local sums rows 2-4.

Building upon the previous discussion, we can also estimate the fraction of employees who were unpaid in 1835, and thus informally organized. As noted above, we assume that all parish employees were unsalaried, and we found that 91 percent of county officers received no salary. In our sample of boroughs, we found that 73.8 percent of borough officers were unsalaried. Extrapolating the number of unsalaried officers based on population and dividing based on the total number of officers for the rest of the English and Welsh boroughs, we find that around 70.7 percent of borough officeholders were unpaid. These estimates are reflected in Table A.4.

| | Total size | | % Male pop. | | % Unpaid |
|---|---|---|---|---|---|
| | **1700** | **1835** | **1700** | **1835** | **1835** |
| Central | 4,920 | 21,305 | 0.33 | 0.63 | 0.00 |
| Parish | 50,000 | 95,520 | 3.33 | 2.81 | 100.00 |
| County | 25,084 | 40,994 | 1.65 | 1.20 | 90.30 |
| Borough | 7,660 | 12,268 | 0.51 | 0.36 | 70.69 |
| **Total (Local)** | 82,744 | 148,782 | 5.52 | 4.38 | 94.91 |

Table A.4: Totals, (male) population shares, and 1835 unpaid shares by category.

## A.3 Tenure and Rotation

Goldie (2001, p. 161) offers another, slightly different perspective on the scale of local government: "[A]n astonishingly high proportion of early modern people held office. This can readily be deduced schematically. In the seventeenth century there were approximately 9700 parishes in England and Wales. If each had one constable, two churchwardens and two overseers, then we have a total of around 50,000 parish officers at any one time. Thus, around the year 1700, about one-twentieth of adult males were governing in any year; in principle, that might mean one half were governing in any decade."

Goldie's estimates about the proportion of the male population employed on an annual/decadal basis imply that A) there were a million adult males in 1700 and B) that the rotation of parish officers was more or less annual. We improve on those figures in two respects: first, we use the more accurate adult male population figure of 1.5 million from Wrigley et al. (1997) and Keibek (2017), and second, we collected data on the rotation of important borough officers and magistrates showing that annually-rotated offices like the mayoralty were usually held by 6-8 distinct individuals within any given decade (House of Commons, 1834).

We start with the assumption that offices that are *not* life-tenured have seven unique holders per decade. From our digitization of the Municipal Corporations report, we know that 30.78 percent of officers are life-tenured. We assume that these have one holder per decade, although in practice, there was almost always some rotation induced by death or retirement. Finally, we have the three categories of county officials: JPs, militia officers, and jurors. We conservatively assume that JPs, militia officers, and the other miscellaneous county offices were rotated once per decade. Given the vast discrepancy between the number of eligible jurors and the number required, rotation was probably frequent in that category.

So, as a first pass, we assume for local government that:

1. **borough officers**: 31% 1 holder per decade, 69% 7 holders per decade
2. **JPs, militia officers, other county offices**: 2 holders per decade
3. **jurors**: 10 holders per decade
4. **parish officers**: 7 holders per decade

For 1700, then, we see a grand total of 546,350 officeholders, and for 1835, we get 938,297.

Taking the population figure of 1,500,000 for 1700, our calculations suggest that 36.4% of adult males held some local office in any given decade. The 1831 census reported 3,394,638 adult males in England and Wales; this gives us 27.6% of adult males in local government.

**Central Government**

How often did central government employees rotate? Brewer (1989, p. 66) wrote that "Employment in administration not only offered prospects but also came, in some departments, to offer security of tenure and promotion on the basis of seniority. Once the political purges of the late seventeenth and early eighteenth century had ended, an assiduous officer in such departments as the Treasury could look forward to an undisturbed career culminating in promotion to the post of senior clerk. (Between 1714 and 1800 only one senior clerk and four under-clerks in the Treasury were dismissed from office.) Not every department was so kind to its employees—dismissal rates in the Excise ranged between 2 and 9 per cent per annum—but in many central offices the acquisition of a post meant security for life."

However, this seems to have been less frequently the case early on in the eighteenth century; Brewer writes that "Security of tenure, longevity of service and departmentalism emerged only gradually ... This fluidity was facilitated by the frequent turnover in government personnel occasioned by the political purges of the 1690s. Twenty-two of the thirty-eight customs commissioners appointed between 1688 and 1715 served for five years or less. The comparable Excise figure was twenty of thirty-seven Board members. Excise commissioners appointed before 1715 held their appointments for less than half the time of those who took office after the Hanoverian Succession" (Brewer, 1989, pp. 67-68).

We conservatively assume that central offices turned over once per decade (or every five years, either because of firings/political patronage or promotion. Then two individuals would hold each central gov-

ernment position in a given decade, giving us 9,840 officeholders in 1700 and 42,610 in 1835, or 0.66 and 1.3% of the adult male population of England and Wales, respectively.

Putting our estimates together, we arrive at the following table:

| **Category** | **Total** | | **% decadal male pop.** | |
|---|---|---|---|---|
| | **1700** | **1835** | **1700** | **1835** |
| Central | 4,920 | 21,305 | 0.33 | 0.63 |
| Parish | 50,000 | 95,520 | 23.33 | 19.70 |
| County | 25,084 | 40,994 | 8.36 | 4.80 |
| Borough | 7,660 | 12,268 | 2.62 | 1.86 |
| **Total (Local)** | 82,744 | 148,782 | 36.42 | 27.64 |

Table A.5: Central and local officers as shares of *decadal* adult-male population.

# B Data: Details

## B.1 Municipal Report Form

Each chapter of the municipal report follows a largely uniform structure. One major reason for this is that the commissioners sent the mayor or town clerk of the borough a form letter requesting information on sixteen heads. We list these categories below.

I. The local limits of the Corporation.

II. The Charters by which it is constituted.

III. The Title of the Corporation, a copy of the governing Charter, and the date of all other Charters.

IV. The several Officers of the Corporation, how, and by whom elected, or removed; the time for which they hold their respective offices; their respective Functions and Privileges, and their Salaries and incidental Emoluments.

V. The mode by which persons become Free; their Duties, Privileges and Emoluments; the Number of Resident and Non-resident Freemen.

VI. By whom and from whom the Ruling Body of the Corporation is elected.

VII. Fees paid on admission to the Freedom or any office in the Corporation, and to whom paid.

VIII. Courts, Criminal and Civil; the Officers or Magistrates presiding or otherwise acting in them; the extent of their jurisdiction, whether exclusive or otherwise; the nature of their process; what Fees are paid in them, and to whom; and Tables of Costs.

IX. The Juries, Grand and Petty, Criminal and Civil; by whom, and from whom selected.

X. The management of the Local Police, and general regulation of the town.

XI. The superintendence of the Gaols; by whom exercised, and under what control.

XII. Fines imposed by the Corporation on their own members or others.

XIII. The nature of the Property; the amount of Receipts of the Corporation, from whom derived, by whom received, to what purposes, and by whom applied; how, and to whom accounted for.

XIV. The Patronage, ecclesiastical and other, exercised by the Corporation, through whom dispensed.

XV. A Schedule of the dates and titles of the Local Acts of Parliament relating to Municipal Government, or Local Taxation.

XVI. The general state and prospects of the Town.

## B.2 Officer-Task Data

Appendix Table B.1 shows descriptive statistics.

Table B.1: Officer-Task Data

| Office | # Boroughs | # Officers | Share Unpaid | Avg Tasks | Most Common Task |
|---|---|---|---|---|---|
| Constable | 226 | 1228 | 0.70 | 1.13 | Law Enforcement |
| Town clerk | 195 | 204 | 0.40 | 3.27 | Clerical |
| Serjeant at mace | 187 | 397 | 0.23 | 2.70 | Law Enforcement |
| Recorder | 186 | 224 | 0.64 | 1.53 | Judicial |
| Mayor | 182 | 202 | 0.53 | 3.20 | Judicial |
| ... | ... | ... | ... | ... | ... |
| Assessor | 2 | 6 | 0.17 | 0.83 | Infrastructure |
| Bridgeman | 2 | 4 | 1.00 | 0.50 | Financial Corp. |
| Brother | 2 | 20 | 1.00 | 0.30 | Governing |
| Catcher | 2 | 2 | 0.50 | 2.00 | Clerical |
| Claviger | 2 | 4 | 1.00 | 1.00 | Clerical |

**Note:** Table shows descriptive statistics associated with the officer-task data introduced in Section 3. Each row presents one officer. We record the number of boroughs that have the respective officer, the number of officers in our data, the share unpaid, and the average number of tasks as well as the most common task taken on by the officer.

## B.3 Borough Data

Appendix Table B.2 shows descriptive statistics.

Table B.2: Borough Data

| Variable | Mean | SD | Min | Max |
|---|---|---|---|---|
| Manorial Lord | 0.34 | 0.47 | 0.00 | 1.00 |
| Charter Year | 1630.83 | 94.00 | 1278.00 | 1827.00 |
| Area | 16293866.23 | 19593104.78 | 134817.61 | 144776160.92 |
| Lay Subsidy Tax (1327) | 4.88 | 7.96 | 0.00 | 51.36 |
| Lay Subsidy Tax (1332) | 7.50 | 12.84 | 0.00 | 91.76 |
| Lay Subsidy Tax (1334) | 10.30 | 15.04 | 0.00 | 100.00 |
| Number of Gentry (1370) | 1.17 | 16.64 | 0.00 | 240.00 |
| Market Town (1680) | 0.71 | 0.48 | 0.00 | 2.00 |
| Seaport (1680) | 0.19 | 0.42 | 0.00 | 2.00 |
| Number of Gentry (1680) | 2.44 | 2.30 | 0.00 | 24.00 |
| Number of Baronets (1680) | 0.24 | 0.43 | 0.00 | 1.00 |
| Number of Knights (1680) | 0.20 | 0.43 | 0.00 | 2.00 |
| Number of MPs (1680) | 0.88 | 1.02 | 0.00 | 4.00 |
| Number of Nobility (1680) | 0.04 | 0.22 | 0.00 | 2.00 |
| Number of Bishops (1680) | 0.02 | 0.14 | 0.00 | 1.00 |
| Longitude | -2.07 | 1.76 | -5.54 | 1.67 |
| Latitude | 52.03 | 1.14 | 50.10 | 55.78 |
| Distance to Coal Field | 45589.20 | 45981.69 | 0.00 | 184097.20 |
| Distance to Border | 20132.16 | 22637.59 | 78.27 | 86650.92 |
| Distance to London | 207212.22 | 102222.10 | 16078.60 | 495034.66 |
| Distance to Market Town | 2954.22 | 4168.72 | 17.43 | 25350.39 |
| Distance to River | 2099.99 | 2444.34 | 1.63 | 16454.80 |
| Mean Slope | 3.06 | 2.17 | 0.26 | 17.77 |
| Wheat Suitability | 34.49 | 14.26 | 1.86 | 88.31 |
| Attainable Pasture Yield | 0.79 | 0.06 | 0.64 | 0.93 |
| Attainable Wheat Yield | 3.25 | 0.72 | 0.10 | 4.12 |
| Lay Subsidy Tax (1524) | 8545.54 | 20596.32 | 0.00 | 191120.50 |
| Population (1524) | 55.52 | 152.42 | 0.00 | 1449.00 |

**Note:** Table shows descriptive statistics associated with the borough data introduced in Section 3. Each row presents one variable. We record the mean, standard deviation, min, and max of each variable.

## B.4 Task Performance Data

Appendix Table B.3 shows descriptive statistics.

Table B.3: Performance Data

| Task | Binary Outcome | Mean | Range | Cutoff |
|---|---|---|---|---|
| Governance | Overall performance assessment | 0.69 | [0, 8] | 6 |
| Justice | More than two courts held | 0.49 | [0, 9] | 3 |
| Infrastructure | Borough lit or paved | 0.49 | [0, 2] | 1 |
| Clerical Work | Borough keeps accounts | 0.57 | [0, 1] | 1 |
| Financial Management | Borough collects direct 'borough rate' | 0.41 | [0, 1] | 1 |
| Prison | Gaol reported adequate | 0.42 | [0, 3] | 1 |
| Law Enforcement | Police reported adequate | 0.31 | [0, 3] | 2 |

**Note:** Table shows descriptive statistics associated with the borough-task performance data introduced in Section 4. Each row presents one task. We record the outcome description, the binarized mean, the raw range, and the cutoff for binarization for each task performance measure.

### Governance

The Analytical Index to the municipal report indicates whether boroughs fall under any of 11 categories of governmental malfeasance, enumerated below, along with a short description.

The 11 categories are as follows:

*Abuse* Boroughs are mentioned under 'abuse' if there is corrupt management of their finances. Common examples include the use of corporation funds for privates purposes or the leasing of town land at low rents to members.

*Bribery* This category largely concerns bribery surrounding municipal or Parliamentary elections.

*Cooping* Cooping was the practice of kidnapping eligible voters and (through violence, alcohol, or drugging) inducing them to vote for a certain candidate. This was rare by the time of the municipal report, at least according to the enumerators.

*Deficiency* Boroughs deemed 'deficient' suffered from some kind of institutional failure, often lacking a sufficiently large police force or qualified candidates for offices.

*Family Influence* This category concerns families appointing relatives to offices or using their official powers to their advantage.

*Incompetency* The index describes incompetency as the selection of officers unqualified to serve and the consequences resulting from such appointments.

*Misconduct* This category is invoked for officers misusing their powers, for instance judges issuing verdicts on personal or political grounds.

*Mismanagement* Mismanagement generally describes the poor use of corporate property or revenues.

*Neglect* This category is heterogeneous, but broadly reflects the insufficient performance of town duties, such as clearing the harbor and roads, keeping accounts, or maintaining the prison.

*Party* Boroughs coded under 'party' were subject to partisanship by officers or the corporation, which often interfered in elections.

*Political Patronage* This category covers instances in which powerful individuals—often a local lord or gentleman—exercise political influence over the activities of the corporation.

We code a borough as being subject to a governance category if it is mentioned in the corresponding index section

## B.5 Incentive and Selection Data

Appendix Tables B.4 and B.5 show descriptive statistics of the incentive and selection measures.

Figure B.1: Prestige and Office Order

**Mayor.** The Mayor is elected annually on the 8th of September, by the freemen, including the common councilmen, from among the jurats.

He is chief magistrate; presides at the sessions and in the court of record, and is also coroner, by virtue of his office.

On his election he appoints a deputy, who must be one of the jurats.

He has a salary of 2 *l.* 13 *s.* 4 *d.*; a fee of 6 *d.* on sealing writs in the court of record, and, as coroner, a fee of 13 *s.* 4 *d.* on every inquest.

**Recorder.** The Recorder, or High Steward, is, on a vacancy, chosen for life, by a majority of the whole corporation.

It has always been the custom to elect a barrister.

His duty is to assist the mayor and jurats at the sessions, or other courts in which the mayor and jurats sit in their judicial capacity, and he has always attended the sessions when there have been prisoners to try. He has a salary of 2 *l.* 2 *s.*, and 10 *l.* 10 *s.* for every attendance at sessions.

**Town Clerk.** The Town Clerk is also appointed for life, by a majority of the whole corporation.

He transacts the law business of the corporation, is clerk of the peace at the sessions, and assists in the court of record.

He has a salary of 2 *l.* a year; his professional charges for business done; a small fee on the admission of freemen; and his fees at the sessions, which are the same as in the county.

**Chamberlain.** The Chamberlain is elected annually, by a majority of the whole corporation, from among the commoners.

He collects the revenue, and makes the disbursements of the corporation, to whom he accounts annually. He has a salary of 18 *s.* 4 *d.*

**Serjeant at Mace.** The Serjeant at Mace is, upon a vacancy, appointed during pleasure, by the mayor for the time being.

His duty is to attend the corporation on public occasions, and to serve notices.

He has a salary of 20 *l.*, a livery, and a fee of 1 *s.* on the admission of freemen.

**Water-bailiff.** The Water-bailiff is appointed during pleasure by the lord of the manor and barony of Folkestone.

His duties are to impannel and summon juries, to act as crier of the courts and keep the gaol.

The office is at present filled by the serjeant at mace.

As water-bailiff he has a salary of 5 *l.*; and a house as gaoler. Both from the lord of the manor.

**Town Crier.** The Town Crier is appointed by the mayor and jurats. His only emoluments are his charges for crying.

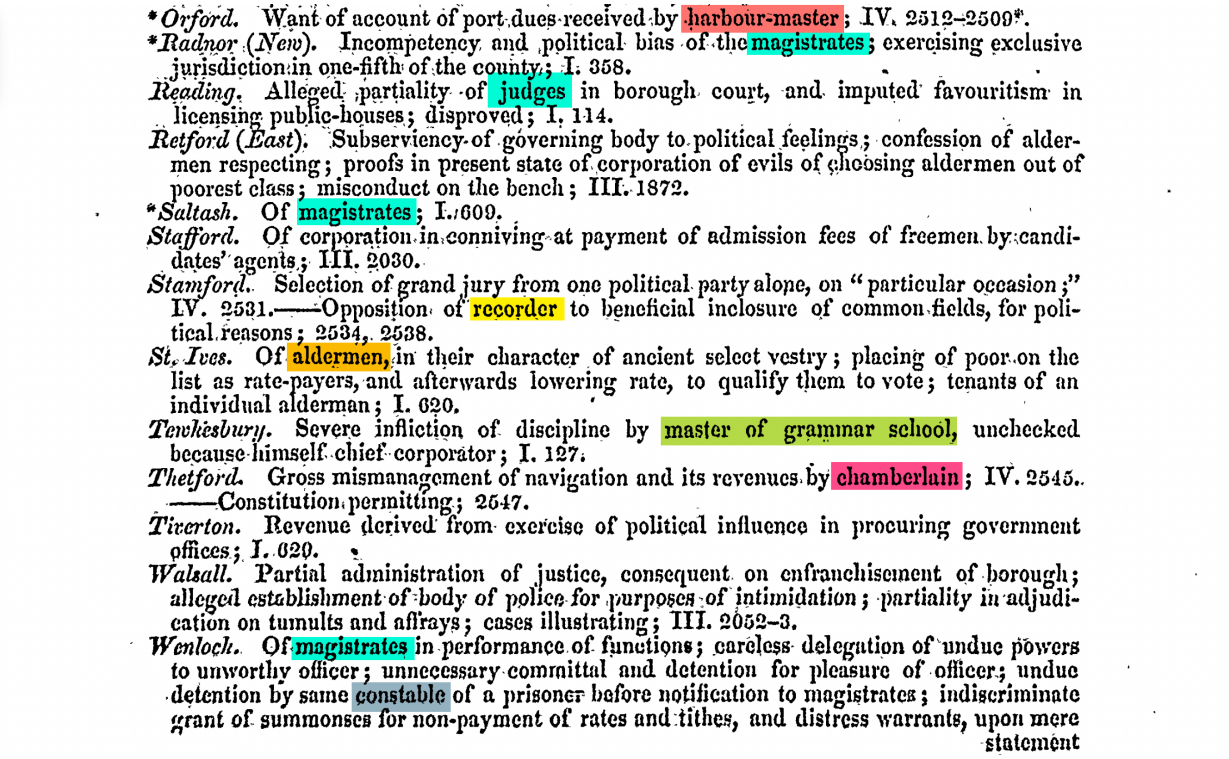
**Note:**

Table B.4: Incentive Data

| Variable | Mean | SD | Min | Max |
|---|---|---|---|---|
| Prestige | 0.46 | 0.32 | 0 | 0.99 |
| Career Concerns | 0.54 | 0.50 | 0 | 1.00 |
| Flexibility | 0.31 | 0.46 | 0 | 1.00 |
| Autonomy | 0.52 | 0.50 | 0 | 1.00 |

**Note:** Table shows descriptive statistics associated with the officer incentive data introduced in Section 5. Each row presents one variable. We record the mean, standard deviation, min, and max of each variable.

Figure B.2: Officer-Level Corruption



*Orford.* Want of account of port dues received by harbour-master; IV. 2512–2509*.
*Radnor (New).* Incompetency and political bias of the magistrates; exercising exclusive jurisdiction in one-fifth of the county; I. 358.
*Reading.* Alleged partiality of judges in borough court, and imputed favouritism in licensing public-houses; disproved; I. 114.
*Retford (East).* Subserviency of governing body to political feelings; confession of aldermen respecting; proofs in present state of corporation of evils of choosing aldermen out of poorest class; misconduct on the bench; III. 1872.
*Saltash.* Of magistrates; I. 609.
*Stafford.* Of corporation in conniving at payment of admission fees of freemen by candidates' agents; III. 2030.
*Stamford.* Selection of grand jury from one political party alone, on "particular occasion;" IV. 2531.——Opposition of recorder to beneficial inclosure of common fields, for political reasons; 2534, 2538.
*St. Ives.* Of aldermen, in their character of ancient select vestry; placing of poor on the list as rate-payers, and afterwards lowering rate, to qualify them to vote; tenants of an individual alderman; I. 620.
*Tewkesbury.* Severe infliction of discipline by master of grammar school, unchecked because himself chief corporator; I. 127.
*Thetford.* Gross mismanagement of navigation and its revenues by chamberlain; IV. 2545.——Constitution permitting; 2547.
*Tiverton.* Revenue derived from exercise of political influence in procuring government offices; I. 620.
*Walsall.* Partial administration of justice, consequent on enfranchisement of borough; alleged establishment of body of police for purposes of intimidation; partiality in adjudication on tumults and affrays; cases illustrating; III. 2052–3.
*Wenlock.* Of magistrates in performance of functions; careless delegation of undue powers to unworthy officer; unnecessary committal and detention for pleasure of officer; undue detention by same constable of a prisoner before notification to magistrates; indiscriminate grant of summonses for non-payment of rates and tithes, and distress warrants, upon mere statement

**Note:** Distinct offices highlighted in different colors. Corruption category is 'misconduct.'

Table B.5: Selection Data

| Variable | Mean | SD | Min | Max |
|---|---|---|---|---|
| Gentleman | 0.42 | 0.49 | 0 | 1 |
| Clergy | 0.02 | 0.13 | 0 | 1 |
| Corruption | 0.07 | 0.25 | 0 | 1 |
| Nepotism | 0.06 | 0.24 | 0 | 1 |

**Note:** Table shows descriptive statistics associated with the officer selection data introduced in Section 5. Each row presents one variable. We record the mean, standard deviation, min, and max of each variable.

# C Performance of the Unpaid State: Details

This section proceeds in three steps. First, we demonstrate that our main results closely match the structural model estimates reported in Appendix Section C.1.
Next, we evaluate the robustness of our findings to alternative model specifications:

- Appendix Section C.2 examines robustness with respect to within- and cross-team spillovers.
- Appendix Section C.3 examines robustness with respect to the estimation of returns to team size.

Finally, we analyze the identification of the regression results within the structural framework, as discussed in Appendix Sections C.4 and C.5.

## C.1 Model

**Inputs**

Denote the task-specific input of officer $bo$ to performance of team $bt$ as $\alpha_{bot}$. To address our research question, we decompose individual inputs without loss of generality as follows:

$$\alpha_{bot} = \alpha + \gamma \cdot u_{bo} + \varepsilon_{bot}, \tag{7}$$

where $\alpha$ is the expected input of a paid officer, $\alpha + \gamma$ is the expected input of an unpaid officer, and $\epsilon_{bot}$ is an officer-team specific component. Our primary parameter of interest is $\gamma$, the expected difference in team production inputs between unpaid and paid officers.

**Team Production**

Following canonical models of team production (Abowd et al., 1999; Bonhomme, 2025), we assume that team output is additively separable in individual officer inputs:

$$Y_{bt} = \lambda_{N_{bt}} \sum_{bo \in O_{bt}} \alpha_{bot} + \varepsilon_{bt}, \tag{8}$$

where $Y_{bt}$ denotes the output of team $bt$, $O_{bt}$ are the officers on team $bt$, $\varepsilon_{bt}$ captures shocks to team output unrelated to officer inputs, $N_{bt} = |O_{bt}|$ is the size of team $bt$, and $\lambda_{N_{bt}}$ is a team-size-dependent scaling factor (normalized so that $\lambda_1 = 1$), which governs returns to scale in team production.

Plugging individual-level inputs from equation (7) into the team production equation (8), we get

$$\begin{aligned} Y_{bt} &= \lambda_{N_{bt}} \sum_{bo \in O_{bt}} (\alpha + \gamma \cdot u_{bo} + \varepsilon_{bot}) + \varepsilon_{bt} \\ &= \alpha \lambda_{N_{bt}} N_{bt} + \gamma \lambda_{N_{bt}} U_{bt} + \underbrace{\lambda_{N_{bt}} \sum_{bo \in O_{bt}} \varepsilon_{bot} + \varepsilon_{bt}}_{\epsilon_{bt}} \end{aligned} \tag{9}$$

where $U_{bt}$ is the number unpaid officers on team $bt$.

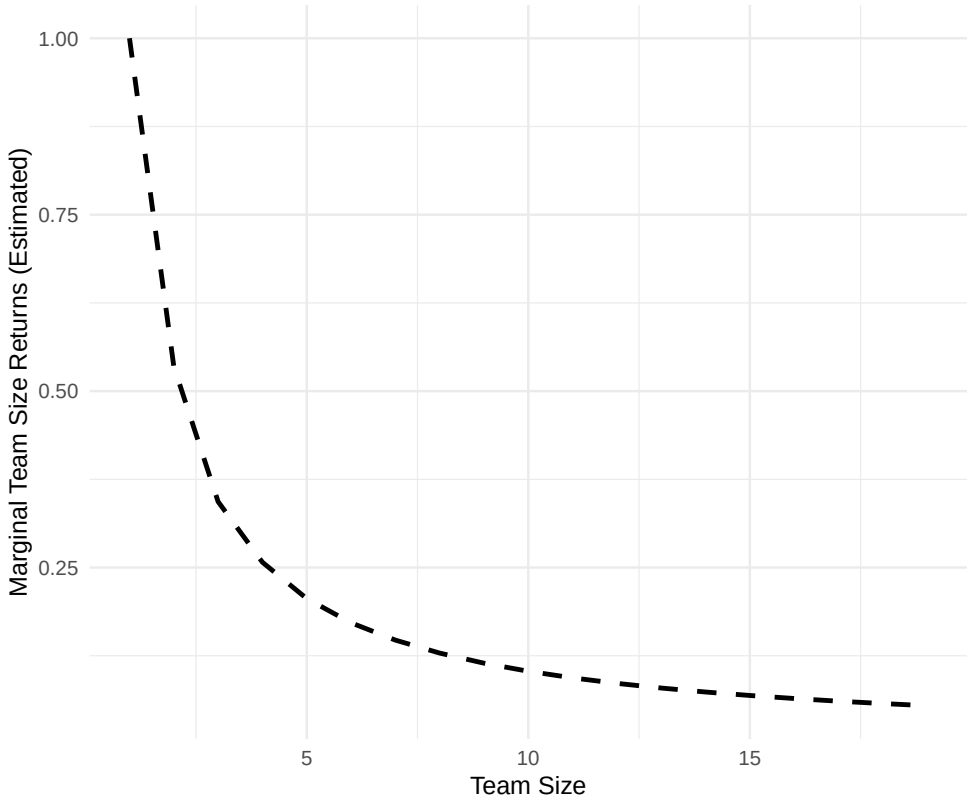
**Estimating $\lambda_{N_{bt}}$**

We first estimate the parameter that governs returns to team size $\lambda_{N_{bt}}$. Drawing on the algorithms proposed in Bonhomme (2025), we use our data on officer-team assignment and team performance to estimate returns to team size.

This approach, which is rooted in a canonical 'movers' design (Abowd et al., 1999), relies on observing individuals across teams. Given the limitations of our historical data, we can estimate the returns to team sizes up to three officers: $\hat{\lambda} = (\hat{\lambda}_1, \hat{\lambda}_2, \hat{\lambda}_3) = (1, 0.53, 0.34)$. This covers 74% of all teams. We then extrapolate the estimated sequence by assuming that the median effective team size remains constant as team size grows beyond our estimated range.

Appendix Figure C.1 plots the estimated sequence of $\hat{\lambda}_{N_{bt}}$ as a function of team size. In Appendix Section 4.3.2, we provide robustness to alternative paths of $\lambda_{N_{bt}}$.

Figure C.1: Estimated Values of $\lambda_{N_{bt}}$ across Team Sizes




**Note:** The figure displays the estimated and extrapolated values of $\lambda_{N_{bt}}$, as a function of team size $N_{bt}$. Team sizes range from 1 to 45.

**Officer-Level Decomposition**

Then, we estimate the team production function in a setup symmetric to our baseline estimating equation (1). Define as $w_{bot}$ an indicator equal to 1 if officer $bo$ is assigned to team $bt$ and 0 otherwise. Rewrite equation (8) to isolate the contribution of a single officer $bo$:

$$Y_{bt} = \alpha \cdot w_{bot}\lambda_{N_{bt}}N_{bt} + \gamma \cdot w_{bot}u_{bo}\lambda_{N_{bt}}U_{bt} + \alpha \cdot (1 - w_{bot})\lambda_{N_{bt}}N_{bt} + \gamma \cdot (1 - w_{bot}u_{bo})\lambda_{N_{bt}}U_{bt} + \epsilon_{bt}, \quad (10)$$

which holds for every officer $bo$ and can thus be estimated in our borough-task panel. Appendix Table C.1 shows results of estimating the empirical analogue of equation (10), using the estimated $\hat{\lambda}$ and a full set of fixed effects. Results are very similar to the baseline results in Table 4.

Table C.1: Unpaid and Performance (Model Estimation)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.17*** | 0.21*** | 0.22*** |
| | (0.04) | (0.04) | (0.04) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.33 | 0.39 | 0.39 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Model Controls | ✓ | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), modified according to equation (10). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

## C.2 Team Production: Spillovers

**Clustering** Because team performance may be correlated within boroughs, we assess the robustness of our results to alternative clustering choices. Appendix Table C.2 reports results from estimating equation (1) with standard errors clustered at various higher aggregation levels. Across all specifications, our main findings remain statistically robust.

**Relative Performance** To limit the scope for cross-team spillovers biasing our results, we construct alternative outcome variables:

1. Team performance relative to the leave-out mean of other teams in the borough,
2. team performance relative to the leave-out max of other teams in the borough,
3. a binary indicator of whether team performance exceeds the leave-out mean of other teams in the borough, and

Appendix Tables C.3, C.4, and C.5 show results from estimating equation (1) using the outcome variables defined in (1)-(4) above. Our findings qualitatively hold up across these increasingly restrictive outcome variables.

**Subsets** To limit the score for within-team spillovers, we restrict our sample to borough-tasks with just one officer. Appendix Table (C.7) shows results. To assess robustness to including very large teams, we can drop our restriction of truncating team size at ten officers: Appendix Table (C.8) shows results when instead using the full team size distribution.

**Aggregation** We next assess the robustness of our findings to aggregating to the team level, to abstract from within-team spillovers. Equation (9) motivates a team-level empirical specification in which we estimate $\gamma$ by regressing team performance on the number of unpaid officers, controlling for overall team size. Specifically, we estimate:

$$Y_{bt} = b\hat{\lambda}_{N_{bt}} U_{bt} + a\hat{\lambda}_{N_{bt}} N_{bt} + X_b \, \mathbb{1}(\tau = t)'\theta + \delta_b + \delta_t + \delta_{ct} + e_{bt}, \tag{11}$$

where all variables are as defined above, and $\delta_{ct}$ are county-by-task fixed effects. Standard errors are clustered at the borough level.

Appendix Table C.9 presents the results. The coefficient on $U_{bt}$ is positive and statistically significant, indicating that a greater number of unpaid officers is associated with higher team performance, even after accounting for total team size and fixed effects.

To account for potential spillovers *between* teams, we aggregate our data to the borough level. We thus estimate

$$Y_b = bU_b + aN_b + X_b + \delta_c + e_b, \tag{12}$$

with $U_b = \sum_{t=1}^{T} \hat{\lambda}_{N_{bt}} U_{bt}$, $N_b = \sum_{t=1}^{T} \hat{\lambda}_{N_{bt}} N_{bt}$, and $Y_b = \frac{1}{T} \sum_{t=1}^{T} Y_{bt}$ the mean performance of the borough across tasks and all other variables as borough-level aggregates of the variables in equation (11). Appendix Table C.10 shows results, which again qualitatively affirm the association between unpaid status and performance.

Table C.2: Unpaid and Performance (Standard Errors)

| | Performance | | | | | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Unpaid Officer on Team | 0.13*** | 0.13*** | 0.13*** | 0.13*** | 0.13*** | 0.13*** | 0.13*** |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.02) | (0.04) | (0.03) |
| Standard-Errors | Borough × Task | Task Scope | Borough | County | 50km | 100km | 200km |
| Observations | 39,851 | 39,851 | 39,851 | 39,851 | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Outcome Mean | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| Borough fixed effects | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Office fixed effects | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Note:** The table presents results of estimating equation (1), using varying standard errors as indicated in the table. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table C.3: Unpaid and Relative Performance (Leave-Out Mean)

| | Relative Performance (Leave-Out Mean) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.12*** | 0.14*** | 0.15*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.12 | 0.19 | 0.19 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.00 | 0.00 | 0.00 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, subtracting the leave-out mean of borough-task performance in the respective borough.

Table C.4: Unpaid and Relative Performance (Leave-Out Max)

| | Relative Performance (Leave-Out Max) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.10*** | 0.12*** | 0.14*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.26 | 0.31 | 0.31 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | -0.36 | -0.36 | -0.36 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, subtracting the leave-out max of borough-task performance in the respective borough.

Table C.5: Unpaid and Outperformance (Leave-Out Mean)

| | Outperform Leave-Out Mean | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.10*** | 0.12*** | 0.13*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.32 | 0.37 | 0.37 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.58 | 0.58 | 0.58 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is a binary indicator of whether borough-task performance exceeds the leave-out mean of borough-task performance in the respective borough.

Table C.6: Unpaid and Outperformance (Leave-Out Max)

| | Outperform Leave-Out Max | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.002 | 0.003 | 0.004 |
| | (0.003) | (0.003) | (0.004) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.15 | 0.16 | 0.16 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.01 | 0.01 | 0.01 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1). Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is a binary indicator of whether borough-task performance exceeds the leave-out max of borough-task performance in the respective borough.

Table C.7: Unpaid and Performance (Single-Officer Teams)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.15*** | 0.11*** | 0.11*** |
| | (0.03) | (0.02) | (0.02) |
| Observations | 14,711 | 14,711 | 14,711 |
| $R^2$ | 0.48 | 0.58 | 0.58 |
| Boroughs | 248 | 248 | 248 |
| Officers | 5,140 | 5,140 | 5,140 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.54 | 0.54 | 0.54 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), restricting the sample to single-officer teams. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.8: Unpaid and Performance (Unrestricted Team Size)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.10*** | 0.12*** | 0.13*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.28 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), not truncating the size of exceptionally large teams. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.9: Unpaid and Performance (Team Level)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officers | 0.13*** | 0.15*** | 0.12*** |
| | (0.04) | (0.03) | (0.04) |
| Observations | 1,330 | 1,330 | 1,330 |
| $R^2$ | 0.34 | 0.40 | 0.59 |
| Boroughs | 258 | 258 | 258 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough | Borough | Borough |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| County × Task fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (11). Observations are at the level of a borough-task. The number of borough-tasks and boroughs in each sample is indicated in the table. Standard errors are clustered at the borough level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table C.10: Unpaid and Performance (Borough Level)

| | Performance (Borough) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officers | 0.13** | 0.15*** | 0.12** |
| | (0.05) | (0.05) | (0.05) |
| Observations | 258 | 258 | 258 |
| $R^2$ | 0.37 | 0.54 | 0.59 |
| Boroughs | 258 | 258 | 258 |
| Outcome Mean | 3.73 | 3.73 | 3.73 |
| Cluster | County | County | County |
| Controls | | | ✓ |
| County fixed effects | | ✓ | ✓ |

**Note:** The table presents results of estimating equation (12). Observations are at the level of a borough. The number of boroughs in each sample is indicated in the table. Standard errors are clustered at the county level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is the mean performance across all tasks in a borough, as introduced in Section 4.

## C.3 Team Production: Returns to Team Size

**Estimated Returns to Team Size** Due to data limitations, we extrapolate estimated returns to team size beyond teams of three members. While this captures three quarters of all teams, we show results when restricting our sample to just those teams in Appendix Table C.11.

**Plausible Returns to Team Size** To assess the robustness of our results across all team sizes and all plausible returns to team size, we evaluate a family of functions for $\lambda_{N_{bt}}$ of the form:

$$\lambda(N_{bt}) = \zeta + (1 - \zeta)\frac{1}{N_{bt}}, \tag{13}$$

where $\zeta \in [0, 1]$. This specification interpolates between constant returns to scale ($\zeta = 1$) and a setting where the marginal contribution of each team member decreases inversely with team size ($\zeta = 0$).
Appendix Figure C.2 plots the resulting values of $\lambda_{N_{bt}}$ against observed team sizes, which range from 1 to 45. We consider $\zeta \in [0, 1]$ in step sizes of $\frac{1}{1000}$.
We then re-estimate regression equation (1), scaling both $w_{bot}$ and $w_{bot}u_{bo}$ by the corresponding $\lambda_{N_{bt}}$. Across the full range of $\lambda_{N_{bt}}$ values considered, the estimated coefficient $\hat{b}$ remains positive and significant at the one percent level, indicating a robust positive relationship between unpaid status and team output.

**Estimating Paid-Unpaid Differences In Inputs** Finally, we can apply the methodology from (Bonhomme, 2025) to assess whether our general findings also hold up in a sample of estimated *individual* team inputs. Note that relying on the 'connected set' reduces our sample to 433 officers.[1]
We proceed in two steps:

1. We estimate individual officer productivity inputs $\hat{\alpha}_{bo}$.
2. We then regress the estimated inputs $\hat{\alpha}_{bo}$ on the paid status of each officer $u_{bo}$.

We thus test for statistically significant differences in individual inputs between unpaid and paid officers. Appendix Table C.12 reports the results of Step 2, both with and without the inclusion of borough fixed effects. Among unpaid officers, estimated inputs are significantly higher than among paid officers.

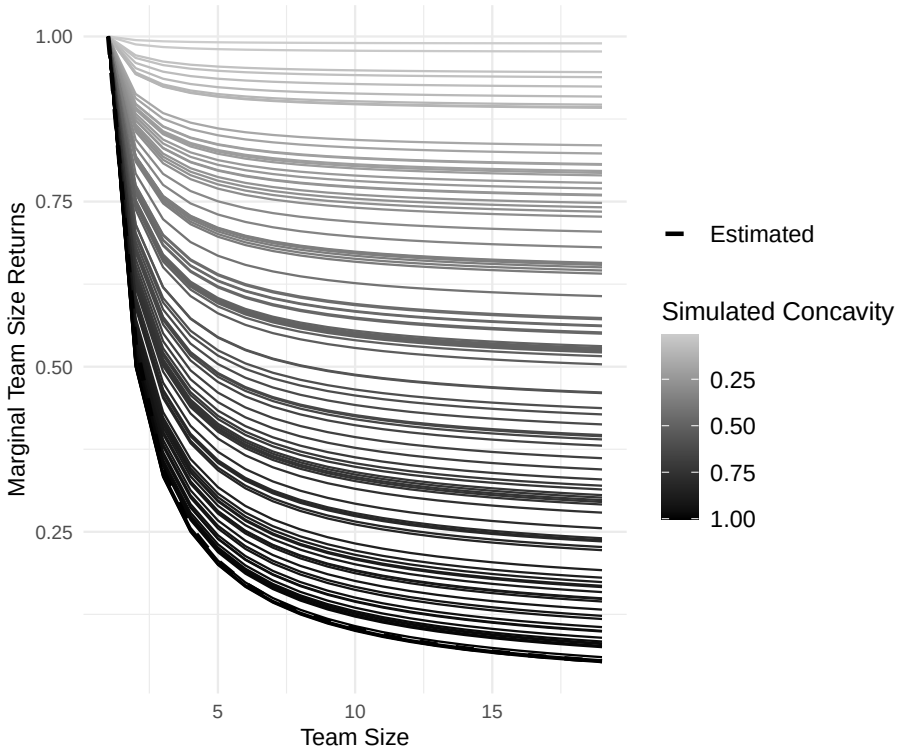
[1] As outlined in equation (7), our parameter of interest relies on the mean of the distribution of individual inputs, and does not require characterizing the full distribution of individual inputs. Hence, our main analyses use the entire sample.

Table C.11: Unpaid and Performance (Estimated Returns)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.10** | 0.09** | 0.09** |
| | (0.04) | (0.04) | (0.04) |
| Observations | 22,563 | 22,563 | 22,563 |
| $R^2$ | 0.44 | 0.50 | 0.50 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Model Controls | ✓ | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note Note:** The table presents results of estimating equation (1), using estimated returns to team size as described in Appendix Section C.3. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Figure C.2: Simulated Values of $\lambda_{N_{bt}}$ across Team Sizes




**Note:** The figure displays the values of $\lambda_{N_{bt}}$ used in our robustness analysis, as a function of team size $N_{bt}$, for selected values of $\zeta$. Team sizes range from 1 to 45.

Table C.12: Unpaid and Estimated Inputs (Team Level, Bonhomme, 2025)

| | Officer Ability | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid | 0.25*** | 0.24*** | 0.26*** |
| | (0.05) | (0.05) | (0.09) |
| Observations | 433 | 433 | 433 |
| $R^2$ | 0.06 | 0.08 | 0.39 |
| Boroughs | 219 | 219 | 219 |
| Outcome Mean | 0.01 | 0.01 | 0.01 |
| Cluster | Borough | Borough | Borough |
| Controls | | ✓ | ✓ |
| Borough fixed effects | | | ✓ |

**Note:** Table presents results from regressing estimated team performance inputs using Bonhomme (2025) on unpaid status in a regression using borough fixed effects. Observations are at the level of an officer. The number of officers in each sample is indicated in the table. Standard errors are clustered at the borough level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

## C.4 Comparable Control Groups

We use the model from equation (9) to structure our discussion on potential omitted variable bias. To estimate $\gamma$ consistently via OLS, we require $\mathbb{E}[\epsilon_{bt} \mid N_{bt}, U_{bt}] = 0$. This requires:

$$\mathbb{E}[\varepsilon_{bt} \mid N_{bt}, U_{bt}] = 0 \quad \text{and} \quad \mathbb{E}[\varepsilon_{bot} \mid N_{bt}, U_{bt}] = 0 \text{ for all } bo \in O_{bt}.$$

**Fixed Effects** The inclusion of fixed effects in equation (1) implies a set of within-transformations that remove variation at the borough, task, and officer level. Most importantly, borough and task fixed effects remove all components of $\varepsilon_{bt}$ that do not vary across boroughs or tasks, respectively. These transformations thus help isolate variation that is orthogonal to systematic differences across boroughs, tasks, and office patterns. Below, we highlight the terms subtracted from the main variables in equation (1) as a consequence of the specific fixed effect.

- **Borough Fixed Effects** ($\delta_b$)
  - $Y_{bt}$:
    $$\frac{1}{O_b \cdot T} \sum_{o=1}^{O_b} \sum_{t=1}^{T} Y_{bt} = \frac{1}{T} \sum_{t=1}^{T} Y_{bt}$$
    Captures borough-level productivity differences across tasks (i.e., 'some boroughs do better than others').
  - $w_{bot}$:
    $$\frac{1}{O_b \cdot T} \sum_{o=1}^{O_b} \sum_{t=1}^{T} w_{bot}$$
    Captures borough-level variation in staffing intensity (i.e., 'some boroughs have more officers' or 'some officers cover more tasks').
  - $w_{bot}u_{bo}$:
    $$\frac{1}{O_b \cdot T} \sum_{o=1}^{O_b} \sum_{t=1}^{T} u_{bo} w_{bot}$$
    Captures borough-level variation in unpaid staffing (i.e., 'some boroughs have more unpaid officers' or 'some boroughs assign them to more tasks').
- **Task Fixed Effects** ($\delta_t$)
  - $Y_{bt}$:
    $$\frac{1}{B \cdot O_b} \sum_{b=1}^{B} \sum_{o=1}^{O_b} Y_{bt} = \frac{1}{B} \sum_{b=1}^{B} Y_{bt}$$

Captures task-specific difficulty (i.e., 'some tasks are easier').

- $w_{bot}$:

$$\frac{1}{B \cdot O_b} \sum_{b=1}^{B} \sum_{o=1}^{O_b} w_{bot}$$

Captures task implementation and staffing (i.e., 'some tasks are more common across boroughs' or 'some tasks have larger teams').

- $w_{bot} u_{bo}$:

$$\frac{1}{B \cdot O_b} \sum_{b=1}^{B} \sum_{o=1}^{O_b} u_{bo} w_{bot}$$

Captures unpaid staffing across tasks (i.e. 'some tasks are more often staffed with unpaid officers' or 'unpaid teams are larger in certain tasks').

- **Office Fixed Effects** ($\delta_o$)

  - $Y_{bt}$:

$$\frac{1}{\underline{O}} \sum_{b=1}^{B} \sum_{o=1}^{O_b} Y_{bt} \mathbb{1}(o = \underline{o})$$

Captures the average task performance of officers with the same office title $\underline{o}$, with $\underline{O} = \sum \mathbb{1}(o = \underline{o})$.

  - $w_{bot}$:

$$\frac{1}{\underline{O}} \sum_{b=1}^{B} \sum_{o=1}^{O_b} w_{obt} \mathbb{1}(o = \underline{o})$$

Measures the scope of typical office task assignments (i.e. 'this office covers more tasks').

  - $w_{bot} u_{bo}$:

$$\frac{1}{\underline{O}} \sum_{b=1}^{B} \sum_{o=1}^{O_b} w_{bot} u_{bo} \mathbb{1}(o = \underline{o})$$

Measures the breadth of unpaid assignments (i.e. 'this unpaid office is assigned to more tasks').

In addition, we can vary the set of fixed effects included in the regression specification. Appendix Table C.13 presents results from a specification that includes task scope fixed effects, office-by-task fixed effects, and county-by-task fixed effects. The estimated correlation with unpaid status remains stable, indicating that our main findings are not sensitive to task-specific confounders that vary at the county level.

**Controls** Appendix Table C.14 reports results from equation (1), including officer-level controls. This addresses potential omitted variable bias from components in $\varepsilon_{bot}$. Specifically, we interact team as-

signment ($w_{bot}$) with indicator variables capturing whether an officer is a magistrate, a member of the governing body or the common council, a Justice of the Peace, or subject to Crown approval. Across all specifications, our main coefficient of interest remains stable and comparable to the baseline estimates. Moreover, the additional controls are not significantly associated with team performance, suggesting that these observed characteristics do not confound the main relationship.

**Matching** To more comprehensively account for potential differences at the borough and officer levels, we implement a propensity score matching approach. Specifically, we estimate a Probit model to predict an officer's unpaid status using the full set of borough and officer characteristics. Based on the estimated propensity scores, we use a nearest neighbor matching algorithm to pair each unpaid officer with the most similar paid counterpart. We then re-estimate regression equation (1) on this matched sample. Results, reported in Appendix Table C.15, are qualitatively consistent with our main specification, indicating that the observed relationship is not driven by systematic differences in observables.

**Outliers** Next, we assess whether our results are driven by specific tasks. Appendix Figure C.3 presents estimates from regression equation (1), sequentially omitting one task at a time from the sample. Across all leave-one-out specifications, the estimated effect of unpaid status remains statistically significant and qualitatively consistent with our main findings, suggesting that no single task is disproportionately influencing the results.

We also assess robustness to the binarization of task performance. Our main measure introduced in Section 4.1 binarizes each ordinal or count measure at the median. Instead, we consider alternative thresholds in a neighborhood of the median: for example, the cutoff for 'number of courts held' is three. We then consider cutoffs in $(2, 3, 4)$. We apply this neighborhood cutoff rule to all performance measures. Then, we choose a random draw from the cross-product of all possible cutoff rules and re-estimate regression equation (1). Appendix Figure C.4 shows results: Throughout all permutations, coefficients remain significant and positive.

We also assess robustness to the definition of task performance. In addition to our main measures introduced in Section 4.1, we consider alternative measures. For governing, we consider whether a borough has adopted imperial measures. For judicial, we count the number of days courts of request sat in 1836. For infrastructure, we construct an indicator for whether a borough had a market cross. For clerical, we use an indicator for whether the report surveyors were supplied with documents by the town clerk. For financial, we construct an indicator for whether accounts were audited. For prison, we consider the number of cells per prisoner. For law enforcement, we take the negative of the number of criminal convic-

tions. Then, we choose a random draw from the cross-product of all possible variable combinations and re-estimate regression equation (1). Appendix Figure C.5 shows results: Throughout all permutations, coefficients remain significant and positive.

Finally, we assess robustness to the definition of paid status. We omit all officers from our data that are paid a small wage, where paid or unpaid status might be ambiguous. We omit all officers paid less than 20 pounds a year (the median wage among paid officers is 16 pounds) and show that results are robust to omitting officers with low wages in Appendix Table C.16.

Table C.13: Unpaid and Performance (Fixed Effects)

| | Performance | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Unpaid Officer on Team | 0.13*** | 0.15*** | 0.17*** | 0.13*** |
| | (0.02) | (0.02) | (0.03) | (0.02) |
| Observations | 39,851 | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.34 | 0.34 | 0.41 | 0.60 |
| Outcome Mean | 0.63 | 0.63 | 0.63 | 0.63 |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Cluster | Borough × Task | Borough × Task | Borough × Task | Borough × Task |
| Borough fixed effects | ✓ | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | | |
| Office fixed effects | ✓ | ✓ | | |
| Task Scope fixed effects | | ✓ | ✓ | ✓ |
| Office × Task fixed effects | | | ✓ | ✓ |
| County × Task fixed effects | | | | ✓ |

**Note:** The table presents results of estimating equation (1), using restrictive fixed effects as indicated in the table. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.14: Unpaid and Performance (Officer Characteristics)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.12*** | 0.14*** | 0.14*** |
| | (0.02) | (0.02) | (0.02) |
| Magistrate × On Task | 0.05 | 0.06 | 0.06 |
| | (0.04) | (0.04) | (0.04) |
| Part of Governing Body × On Task | -0.07 | -0.05 | -0.05 |
| | (0.05) | (0.04) | (0.04) |
| Part of Common Council × On Task | -0.04 | -0.01 | -0.01 |
| | (0.04) | (0.04) | (0.04) |
| Justice of the Peace × On Task | -0.03 | -0.03 | -0.04 |
| | (0.04) | (0.04) | (0.04) |
| Approval by Crown × On Task | -0.03 | -0.10 | -0.10 |
| | (0.08) | (0.07) | (0.07) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.29 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

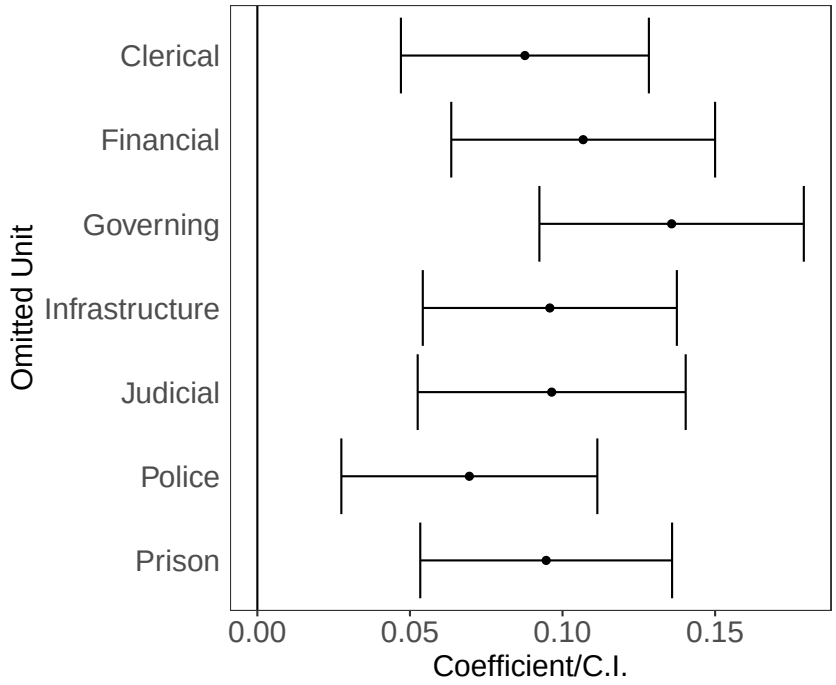
**Note:** The table presents results of estimating equation (1), controlling for officer characteristics as indicated in the table. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.15: Unpaid and Performance (Matching)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.11*** | 0.14*** | 0.17*** |
| | (0.03) | (0.03) | (0.04) |
| Observations | 26,124 | 26,124 | 26,124 |
| $R^2$ | 0.29 | 0.35 | 0.35 |
| Boroughs | 238 | 238 | 238 |
| Officers | 3,732 | 3,732 | 3,732 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.64 | 0.64 | 0.64 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

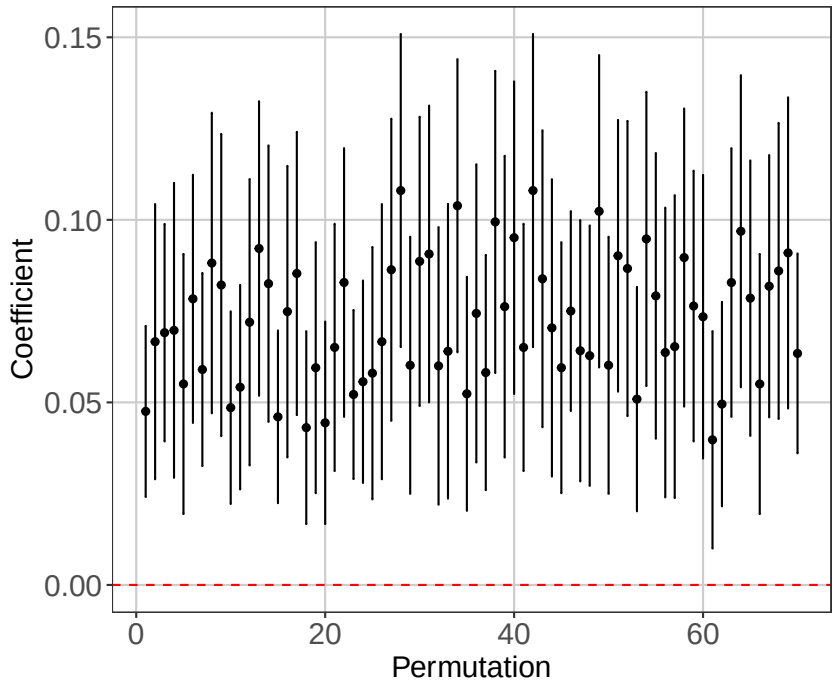
**Note:** The table presents results of estimating equation (1), in a matched sample. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Figure C.3: Unpaid and Performance (Leave-Out)



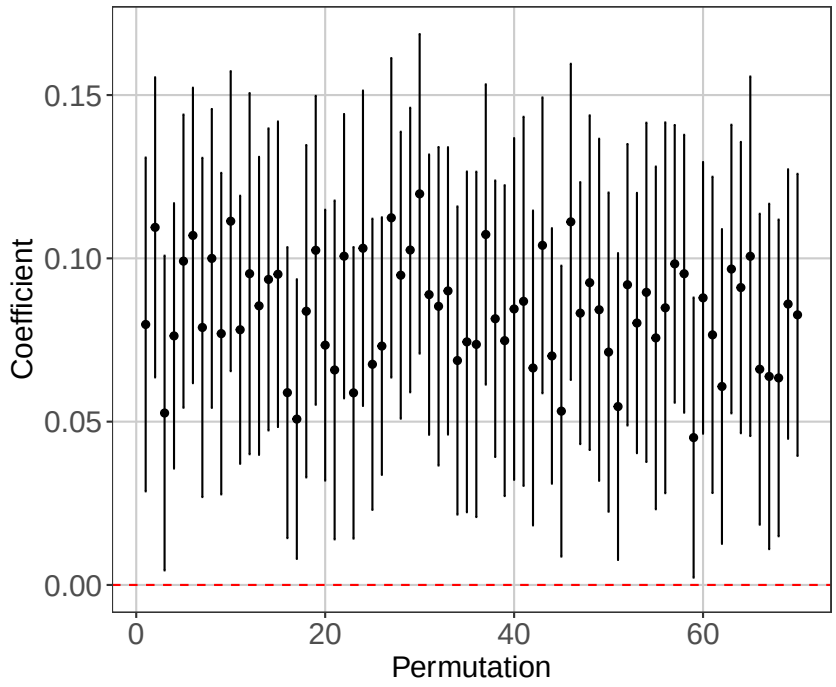

**Note Note:** The figure presents results of estimating equation (1), leaving out one task at a time. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Figure C.4: Unpaid and Performance (Binarization Variation)




**Note:** The figure presents results of estimating equation (1), varying the cutoffs for borough-task performance binarization as detailed in Appendix Section C. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Figure C.5: Unpaid and Performance (Definition Variation)




**Note:** The figure presents results of estimating equation (1), varying task performance definitions as detailed in Appendix Section C. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.16: Unpaid and Performance (Omitting Low Wages)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unpaid Officer on Team | 0.09*** | 0.10*** | 0.11*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 32,767 | 32,767 | 32,767 |
| $R^2$ | 0.28 | 0.34 | 0.34 |
| Boroughs | 255 | 255 | 255 |
| Officers | 4,681 | 4,681 | 4,681 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.64 | 0.64 | 0.64 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), omitting officers with low wages. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

## C.5 Unaffordability

**Unaffordability Construction** The creation of the unaffordability variable $v_{bo}$ relies on three components: (1) pre-determined rental income, (2) market wages, and (3) a salary prioritization ranking. One concern is that the specific functional form of (2) and (3), rather than (1), are driving the relevant variation in the variable. Figure 9, Panel B suggests that this is not the case, given the balance of $v_{bo}$ on pre-determined office observables.

We provide further evidence to this end. First, we show that unaffordability calculated under true rental incomes, $v_{bo}$ is more predictive of unpaid status than unaffordability calculated under counterfactual rental incomes $\tilde{v}_{bo}$. We randomly re-assign rental income within counties and predict unpaid status $u_{bo}$ using counterfactual rental income $\tilde{v}_{bo}$ 1,000 times. Appendix Figure C.6 shows results: the t-statistic associated with the 'true' prediction is in the far right tail of the distribution of t-statistics under the counterfactual rental incomes.

Second, we show robustness to three alternative ways of calculating market wages and salary prioritization. Appendix Table C.18 shows results when calculating local wages and rankings (comparing just officers within the same county). Appendix Table C.19 inverts this logic, showing 'global' wages and rankings (using data on officers not in the same county to calculate wages and rankings). Finally, Appendix Table C.20 just uses charter officers to calculate wages and rankings. Where no task profile-specific comparison can be formed, we impute wages using the sample mean. Results are qualitatively similar to the main results in Table 5. Furthermore, Appendix Table C.17 shows that results from the unrestricted sample are qualitatively very similar to results obtained in the complier sample.

**Direct Impact** Another concern is that the rental income directly impacts borough financial performance: high rental income might require the keeping of accounts. Appendix Table C.21 shows that results are robust when omitting financial tasks from the estimation.

**Substitution** Another concern involves substitution along the extensive margin — such as boroughs reallocating tasks across officers or reducing the number of officers — which could affect team assignment, $w_{bot}$. To address this concern, we use institutional constraints embedded in borough charters, which mandated the presence of specific officers. We subset our data to just officers that were specified in the charter, and just to the modal task of each officers. We repeat the construction of unaffordability using charter officers and modal tasks. Appendix Table C.22 shows that results are robust to using this predetermined set of officers.

Table C.17: Unaffordable and Performance (Full Sample)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Officer on Team | 0.12*** | 0.12*** | 0.12*** |
| | (0.03) | (0.03) | (0.03) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.29 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.18: Unaffordable and Performance (Local Comparison)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Officer on Team | 0.06** | 0.07*** | 0.07*** |
| | (0.03) | (0.03) | (0.03) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.28 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

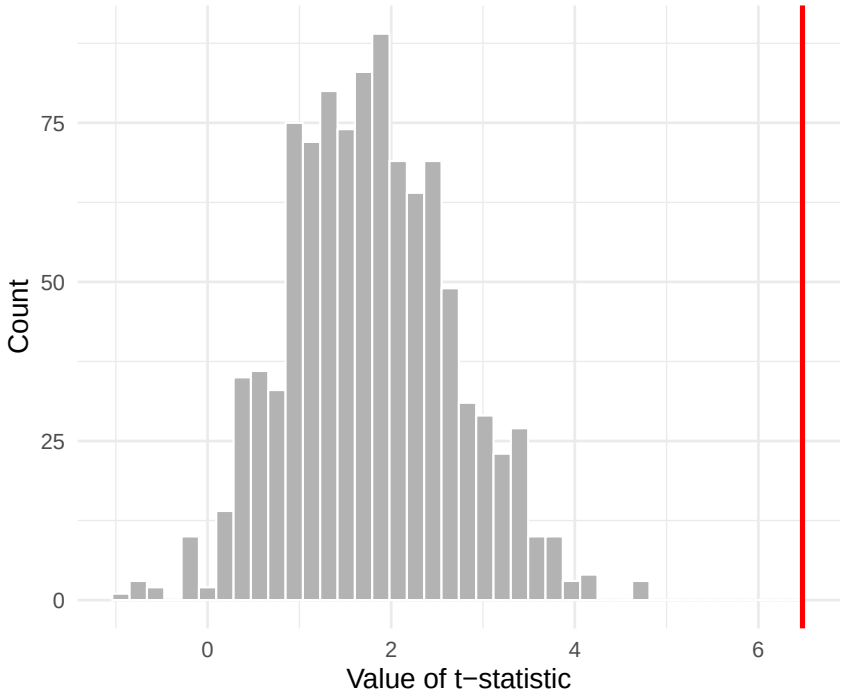
**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$ and restricting to officers within the same county to calculate market wages and salary rankings. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.19: Unaffordable and Performance (Global Comparison)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Officer on Team | 0.12*** | 0.12*** | 0.12*** |
| | (0.03) | (0.03) | (0.03) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.29 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$ and restricting to officers outside the same county to calculate market wages and salary rankings. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Figure C.6: Unaffordable and Unpaid Status (Randomization)




**Note:** Figure shows t-statistics associated with 1,000 OLS regressions of the form $u_{bo} = \beta_0 + \beta_1 \tilde{v}_{bo} + \varepsilon_{bo}$. $\tilde{v}_{bo}$ is obtained by randomly reassigning rental income within counties and re-calculating affordability as detailed in Section 4.5. The red line indicates the t-statistic associated with $\tilde{v}_{bo}$ under the true rental income of each borough. Observations are at the level of an officer. The sample comprises of 6,558 officers.

Table C.20: Unaffordable and Performance (Charter Comparison)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Charter Officer on Team | 0.11*** | 0.11*** | 0.11*** |
| | (0.03) | (0.03) | (0.03) |
| Observations | 39,851 | 39,851 | 39,851 |
| $R^2$ | 0.28 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.63 | 0.63 | 0.63 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$ and restricting to chartered officers to calculate market wages and salary rankings. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.21: Unaffordable and Performance (Task Subset)

| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Officer on Team | 0.11*** | 0.12*** | 0.12*** |
| | (0.03) | (0.03) | (0.03) |
| Observations | 28,465 | 28,465 | 28,465 |
| $R^2$ | 0.29 | 0.34 | 0.34 |
| Boroughs | 258 | 258 | 258 |
| Officers | 5,693 | 5,693 | 5,693 |
| Tasks | 5 | 5 | 5 |
| Outcome Mean | 0.58 | 0.58 | 0.58 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$, and restricting the sample to non-financial tasks. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

Table C.22: Unaffordable and Performance (Charter Officers)

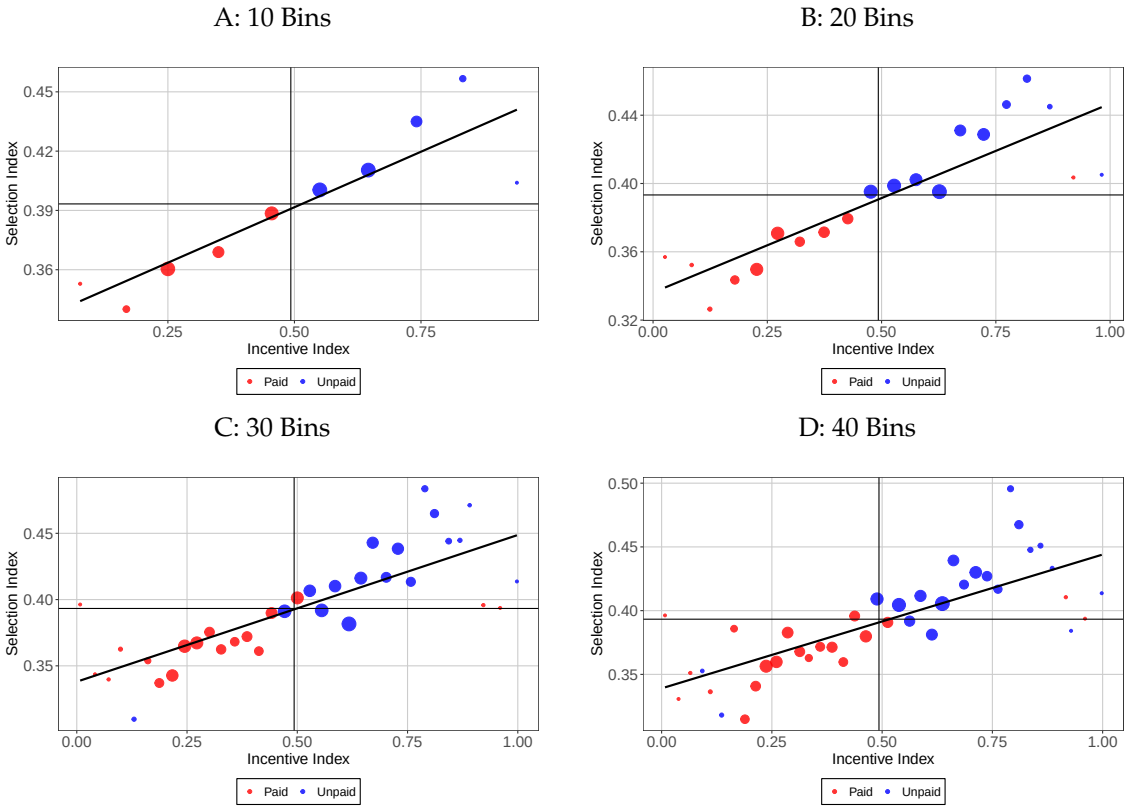
| | Performance | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Unaffordable Charter Officer on (Modal) Team | 0.20*** | 0.16** | 0.16** |
| | (0.07) | (0.07) | (0.07) |
| Observations | 11,949 | 11,949 | 11,949 |
| $R^2$ | 0.32 | 0.40 | 0.40 |
| Boroughs | 137 | 137 | 137 |
| Officers | 1,707 | 1,707 | 1,707 |
| Tasks | 7 | 7 | 7 |
| Outcome Mean | 0.66 | 0.66 | 0.66 |
| Cluster | Borough × Task | Borough × Task | Borough × Task |
| Task Control | ✓ | ✓ | ✓ |
| Controls | | ✓ | ✓ |
| Borough fixed effects | ✓ | ✓ | ✓ |
| Task fixed effects | ✓ | ✓ | ✓ |
| Office fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (1), replacing observed unpaid status $u_{bo}$ with predicted unaffordability $v_{bo}$, and restricting the sample to charter officers and modal tasks. Observations are at the level of an officer-task. The number of officer-tasks and officers in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. The dependent variable is borough-task performance, as introduced in Section 4..

# D Incentive and Selection Robustness

Appendix Figure D.1 shows versions of Figure 6 with varying bin sizes. Appendix Table D.1 shows the correlation between incentive and selection indices. Finally, Appendix Figure D.2 shows a decomposition of the main performance estimation of Table 4 into officers with and without a title, demonstrating that the effect of unpaid status is concentrated in those officers with a title.

Figure D.1: The Embedded State Within Boroughs (Varying Bins)



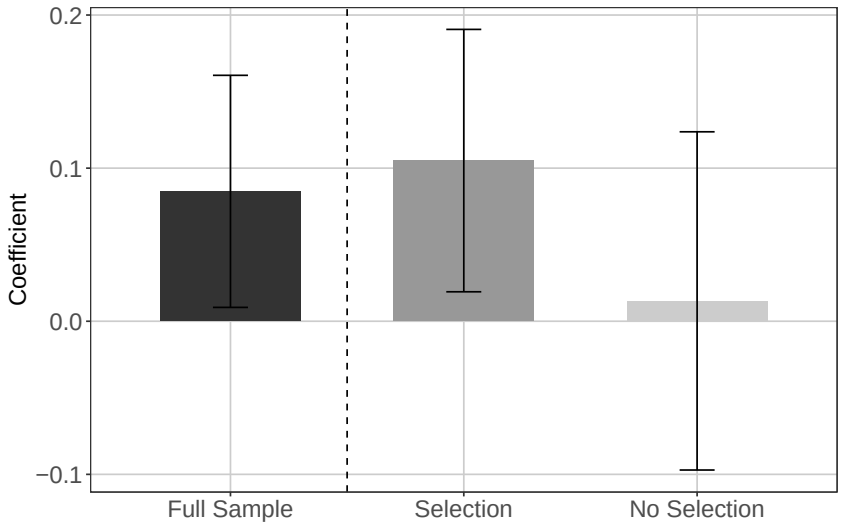

**Note:** The figure presents results of estimating equation (5) in a binned scatterplot using 10, 20, 30, and 40 bins, respectively, in Panels A–D. The x-axis plots the incentive index, and the y-axis the selection index introduced in Section 5. Vertical and horizontal lines indicate the respective conditional means. Majority-unpaid bins are represented by blue circles, while red diamonds denote majority-paid bins. We adjust the size of each bin to reflect the number of underlying observations. Observations are at the level of an officer. The sample comprises of 6,558 officers.

Table D.1: The Embedded State Within Boroughs

| | Selection Index | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Incentive Index | 0.13*** | 0.13*** | 0.12*** |
| | (0.02) | (0.02) | (0.02) |
| Observations | 5,693 | 5,693 | 5,693 |
| $R^2$ | 0.07 | 0.07 | 0.50 |
| Boroughs | 258 | 258 | 258 |
| Outcome Mean | 0.09 | 0.09 | 0.09 |
| Cluster | Borough | Borough | Borough |
| Controls | | ✓ | ✓ |
| Borough fixed effects | | | ✓ |

**Note:** The table presents results of estimating equation (5). Observations are at the level of an officer. The sample comprises of 6,558 officers. *, **, and *** denote significance on the 10 percent, 5 percent, and 1 percent level, respectively. . The dependent variable is is the selection index introduced in Section 5.

Figure D.2: Performance of the Embedded State (Selection Split)




**Note:** The figure presents results of estimating equation (1) in a subset of officers with known names. The left bar shows the main coefficient in the named sample. The middle bar shows the main coefficient in a sample of officers with a title. The right bar shows the main coefficient in a sample of officers without a title. Observations are at the level of an officer-task. The sample comprises of 1,604 (left bar), 666 (middle bar), and 938 (right bar) officers.

# E Local Government in Comparative Perspective

This paper studies the Embedded State in one context—early nineteenth-century England. In the following section, we suggest that the organization of municipal government was broadly similar in several other Western countries at the same time. Like England, both Prussia and France had long traditions of corporate urban governance, and like England, both countries introduced reforms to standardize city organization. We also discuss the United States, which adopted English institutions during the early phase of colonization.

## Prussia

**Pre-Reform** Before the nineteenth century, Prussian municipal government was organized through a patchwork of corporate city constitutions rooted in chartered privilege and estate society. Urban authority typically rested with self-perpetuating councils (*Rat*, *Ratsherren*) dominated by patrician families or guild elites, alongside one or more *Bürgermeister* whose authority was derived from status rather than uniform public law. Municipal officers were not clearly distinguished from local notables: councilors, guild wardens, and market officials combined regulatory, judicial, and fiscal roles, while administrative staff such as town clerks and treasurers were personally dependent on ruling elites rather than embedded in a professional hierarchy. Compensation was equally heterogeneous. Although many governing offices were formally unsalaried, officeholding conferred fees, perquisites, jurisdictional rights, and social status. State supervision was irregular and patrimonial, with royal officials intervening episodically rather than through a standardized legal framework (but often exerting significant control).

**Post-Reform** The Municipal Ordinance of 1808 (part of the well-known Stein-Hardenberg reforms) fundamentally reorganized Prussian cities by replacing corporative privilege with generalized municipal self-government under public law. Urban government was reconstituted around two distinct organs: an executive *Magistrat* and a representative *Stadtverordnetenversammlung*. However, the reform did not professionalize municipal governance wholesale. Instead, it created a mixed system in which a small number of paid officials—the *Bürgermeister* and one or more salaried executive councilors—governed alongside a numerically dominant body of unpaid councilors (*Ehrenamt*). Service was made compulsory for eligible citizens, transforming unpaid office from a status privilege into a civic obligation. At the same time, a modest corps of salaried clerks, treasurers, police officials, and other specialists exercised administrative functions (Goodnow, 1889, 1890; Bishop, 1908; Dorn, 1931, 1932).

**Tiers of Government** After the Stein-Hardenberg reforms, municipalities held self-government within an integrated multi-tiered administrative system. Cities enjoyed autonomy over local finance, policing, welfare, and infrastructure, but were legally subordinate to higher authorities. At the district or *Kreis* level, the *Landrat*—a paid, crown-appointed official, often drawn from the local landed elite—served as an intermediary between municipalities and the state, relying on some unpaid local participation through district committees and estates. Above the *Kreis*, provinces were largely bureaucratic, staffed by salaried officials. The result was a distinctive Prussian synthesis: a thin, professional state bureaucracy governing through and alongside a thick layer of unpaid municipal and district officeholders. This arrangement preserved strong central oversight while embedding local elites directly in everyday administration, differentiating Prussia both from France's prefect-dominated model and from more fully professionalized municipal systems later in the nineteenth century (James, 1901a,b; Ashley, 1906; Munro, 1927).

## France

**Pre-Reform** Before the Revolution in 1789, French municipal government was, like England's, fragmented and heterogeneous. Towns were governed by municipal corporations (*corps de ville*) whose composition and authority varied, featuring offices such as échevins, consuls, or capitouls. Local offices were monopolized by local elites and often venal. Many municipal offices lacked salaries but still yielded fees, exemptions, and social capital, while others were explicitly venal. Above the towns, effective territorial authority rested with royal intendants, appointed crown agents responsible for justice, policing, and finance within *généralités*. Coordination with the center was largely discretionary (Ashley, 1906; Mousnier, 1979; Collins, 1995).

**Post-Reform** The Revolution dismantled the municipal corporations and replaced them with a uniform system of communes, created by the law of 14 December 1789 and reorganized under Napoleon. Each commune was governed by a mayor (maire), deputies (adjoints), and a municipal council, while higher territorial administration was entrusted to prefects following the Law of 28 Pluviôse Year VIII (1800). Unlike Prussia, French reform did not embed unpaid officials within executive administration. Instead, it produced a sharp functional division: professional, salaried state administrators (prefects and subprefects) oversaw legality and execution, while municipal mandates were treated as "fonctions gratuites"—unpaid civic roles rooted in local representation rather than administrative expertise. By the 1830s, this system generated enormous numbers of unpaid municipal officers, reflecting the dense commune map, but concentrated executive authority above the local level (Ashley, 1906; Chapman, 2024).

**Tiers of Government** By the 1830s, French municipal government was embedded in a rigidly hierarchical territorial system. Communes exercised authority over local services and finance but operated under the prefect, who controlled budgets, appointments, and law. Arrondissements and departments functioned as extensions of central administration rather than as self-governing tiers, staffed by salaried officials and small paid councils of prefecture. This structure produced a distinctive pattern: mass unpaid participation at the municipal level combined with a professionalized, centralized executive apparatus above it. In contrast to Prussia, unpaid local officers in France remained largely representational, while effective administrative power was monopolized by the state's territorial bureaucracy (Chapman, 2024).

## The United States

**Origins** Unsurprisingly, early American municipal governments were nearly identical to the English chartered corporations. Nearly all towns of sufficient size possessed a mayor, common council (often including aldermen), a recorder, a town clerk, a high constable, a chamberlain, and a treasurer, or equivalent officers. Most of these officers were unpaid, and the corporation attempted to direct their fees to the town treasury (with varying degrees of success). Mayors were rarely salaried until the early nineteenth century, and even then only in larger cities, where they were offered modest salaries. City councilors were usually unpaid (Reed, 1926).

**Evolution** With rapid population growth, American cities began to start offering salaries to hire more qualified and dedicated (i.e., full-time professional) employees to manage policing, administration, and infrastructure. As the nineteenth century progressed, the mayors of larger cities (and also of smaller ones) began to be salaried, as did some city councilors. Cities also began to hire city managers to run local administrations, often offering them higher salaries than the mayor in order to attract educated professionals or businessmen. For most positions, however, cities were not entirely successful in offering high enough salaries to attract skilled professionals; (Reed, 1926, p. 80) notes that up to 1860, American cities were "almost always in the hands of bungling amateurs."

"As cities grew in size and the services which they must render multiplied, it became necessary to employ larger and larger numbers of persons to preserve the peace, sweep the streets, clean the sewers, and so on... The task of supervising this body of employees and of directing the expenditure of great sums of money in large municipal undertakings called increasingly for men of real capacity who should devote long hours of labor to their performance. Furthermore, in many branches of city administration there was a growing need of men possessed of a high degree of technical knowledge... No prudent individual

or well-conducted business corporation would trust the management of important affairs to the care of inexperienced, incompetent or inadequately paid agents" (Reed, 1926, p. 79).

## Comparison

England's largely unprofessional and autonomous local administration was, to an extent, mirrored in Prussia, France, and the United States before the French Revolution. At the municipal level, chartered corporations predominated, usually run by unsalaried (though not necessarily unpaid) local officeholders drawn from local elites who often performed a variety of tasks. From 1789 on, Prussia and France enacted significant reforms to rationalize their heterogeneous institutions. In Prussia, the Stein–Hardenberg reforms replaced corporate city privilege with a standardized public-law constitution and a uniform system of municipal officeholding. This entailed compulsory unpaid civic office in the form of city councilors (*Ehrenamt*), salaried mayors, and a small cadre of paid specialists (clerks, police, etc.) who performed most urban administrative tasks.

France, by contrast, dismantled municipal corporations altogether during the Revolution and replaced them with the communes, whose mayors and councilors were formally unpaid, but whose autonomy was circumscribed. Communes might employ a few paid workers, such as a clerk, teacher, or guard, but most administration was handled at a higher level. In the United States, municipalities adopted English institutions during the colonial period, and were typically also run by bureaucracies of unpaid amateurs. This began to change during the early nineteenth century, but until relatively late, salaries were not sufficiently high or extensive to attract many skilled professional employees.