

The Embedded State Appendix O: Online Supplement

O.A The Local State: Details

In this section, we discuss the overall number of employees of the English state, both at the central and local level.

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

Before the late nineteenth century, the central state was mostly confined to London, and had three primary responsibilities: managing the military, conducting foreign policy, and collecting several taxes, mainly customs dues on trade and the excise tax on domestic consumption.³ To raise these taxes, it employed a rotating corps of revenue officers in the countryside and ports. The central state expanded over the course of the eighteenth and nineteenth centuries 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 predominantly organized by *local* government.

Local government in England consisted of three main layers. Below the central government, there were 52 counties, which were in turn subdivided into about 10,000 ancient parishes. In between the counties and the parishes were cities and towns, which had varying degrees of self-governance. 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 either infrequently kept or not preserved.

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

³There was some overlap; see Dal Bó et al. (2022).

columns normalize by the adult male population. The last column contains an estimate of the fraction of employees who were unpaid. 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 were paid. By 1835, this number had increased to 21,305 (0.63% 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. Parish governments consisted of several positions that were yearly rotated among the inhabitants of the parish. For example, parishes usually employed 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.⁴ We estimate that the total number of individuals who had such recognized offices at the parish level was equal to about three percent of the adult male 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 positions were paid. Some were allowed to collect fees; the constable, for example, was sometimes allowed to collect a fee for law enforcement (Kent, 1981). Yet the vast majority of parish officers worked part-time, performing 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 indicator available in the 1841 census to define a city. At the city level, there were a myriad of 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, with wide variation in pay across towns. Liverpool, with more than twice the population of Norwich, employed a similar number of officers. Liverpool paid nearly all of its officers, while Norwich paid only half of its own. Table 3 lists the most and least common offices in our sample. While there is a lot of diversity, most boroughs had 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

⁴For a brilliant treatment of parish governance, see Tate (1969).

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.⁵ We map counties in Panel C of Figure 1. At the county level, governance was less dense than at the lower levels of government; county governments were primarily charged with law enforcement and the maintenance of the courts of quarter sessions. The most common positions at this tier of government were the sheriffs, quarter sessions jurors, and Justices of the Peace. A final common officer was the militia officer, responsible for military recruitment. Formally, the county was headed by a Lord Lieutenant of the county. At the county level, too, most positions were unpaid. We estimate that there were 25,000 positions 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. The unsalaried nature of local government 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 positions were appointed at the local level and neither supervised nor paid by London. The number of unpaid positions is about 7 times the size of the paid bureaucracy.⁶

O.A.2 Estimation Details

O.A.2.1 The Local State

In this 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:

⁵Other levels of local government existed in the nineteenth century. These include the hundreds, which were a level in between counties and parishes. Other units include soke 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 systematically employ individuals, we do not include them here. Similarly, there were medieval manorial courts, called ‘courts leet’. They appointed some prominent positions in parish government, such as the pinder, the hayward, or the hogringer. Some positions 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).

⁶Our estimate of the size of local government is an underestimate. This is so for two reasons. First, there was a diffuse array of positions 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 did not exist everywhere and their number is uncertain. Second, Goldie (2001) points out that most unpaid positions rotated yearly, whereas most salaried positions had longer tenure times. In Appendix Section O.A.3, we account for this turnover and find that around 26.3% of the male population may have held some local position in any given decade during the early nineteenth century.

1. County positions
2. Parish positions
3. Borough positions

We discuss each category in turn. Then, in a final subsection, we describe two further layers of government—the land tax and statutory authorities—that played major roles in both revenue collection and the provision of public goods.

County Government

Goldie (2001, p. 162) offers rough figures for three main categories of county-level positions, based on Rudolf von 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 O.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 O.A.1: JP Counts Across England and Wales (Landau, 1984, pp. 367–73)

In place of von Gneist’s conjecture of 8,000 militia officers in 1800, we consult an 1828 Parliamentary report, which gives a total of **5,781 officers** (House of Commons, 1828). We use this figure for 1700 for lack of better evidence.

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). We therefore assume that von Gneist’s total of **10,000** was static across both years.

On top of JPs, militia officers, and jurors, there was 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 (paid):** A Parliamentary report for 1839 found that there were 148 county coroners for England and Wales (House of Commons, 1840). Coroners were nominally entitled to fees for certain inquests.
- **Custos Rotulorum (unpaid):** 52 — one per county
- **Lord Lieutenant (unpaid):** 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 positions (paid):** According to an 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, 1833b).

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 positions in 1700 and 40,994 in 1835, of which 84.0 and 90.2 percent, respectively, were unpaid. The 1700 unpaid share 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 positions in 1700 and 1800. For the seventeenth century, he counts approximately 9,700 parishes in England and Wales, each with one constable, two churchwardens, and two overseers, for a total of around 50,000 parish officers at any one time (Appendix Section O.A.3 quotes the passage). For 1800, he reports that “Rudolf von 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 positions and roughly 10,000 ancient parishes to be our baseline. The result is 50,000 parish positions. For 1835, assuming each parish had approximately six positions, 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 positions for that year as follows:

Estimate for 1835

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

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 four statutory 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 positions 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 positions for 277 municipal boroughs.⁷ These boroughs, however, represent only a subset of the 1,050 towns 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 positions in each town outside our sample based solely on population. To account for the lower intensity of governance outside our

⁷The report and its 1838 follow-up cover 277 boroughs. Of these, 19—mostly small or decayed corporations—record either no positions or none that perform any of our seven tasks, leaving the 258 boroughs of our position-level analysis.

sample, we assume that towns smaller than the median municipal borough in 1841 had no positions (outside of parish officers), and that non-municipal towns above the median 1841 municipal population had 50% of the predicted number of positions. For 1835, we combine the actual numbers of positions from the 277 boroughs in our sample with the predictions for the remaining towns above the median size. The numbers for 1700 are all predicted from the late seventeenth-century population figures. From this exercise, we get:

- **1700:** ~7,660 municipal positions
- **1835:** ~12,268 municipal positions

These estimates are probably conservative, but as a lower bound, one could consider just the 5,710 positions employed in municipal boroughs whose tasks we directly observe in the municipal report.

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

- **1700:** 7,660 borough + 50,000 parish + 25,084 county = 82,744
- **1835:** 12,268 borough + 95,520 parish + 40,994 county = 148,782

O.A.2.2 The Central Bureaucratic State

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

Summary Table

Table O.A.3 below combines our estimates of the numbers of central and local positions 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 Embedded State, we divide our totals by the size of the male population of England and Wales in each benchmark year. There are no exact figures for 1700, a century

Table O.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.

before the first census, but Wrigley et al. (1997) and Keibek (2017) estimate 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 the last two columns.

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 O.A.3: Total Numbers and Population Shares of Central and Local Positions 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 about 90 percent of county positions received no salary. In our borough sample, we found that 67.7 percent of borough positions were unsalaried. Extrapolating the number of unsalaried positions based on population and dividing by the total number of positions 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 O.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	1.67	1.21	90.22
Borough	7,660	12,268	0.51	0.36	70.69
Total (Local)	82,744	148,782	5.52	4.38	94.89

Table O.A.4: Totals, (Male) Population Shares, and 1835 Unpaid Shares by Category

O.A.2.3 Other Layers of Government

While the foregoing section suggests a stark contrast between a small, professional central government and a large, unsalaried local state, there are two further layers of government that contributed substantially to tax collection and the provision of public goods. First, the collection of the land tax—in contrast to the bureaucratic Excise and Customs administrations—was highly decentralized, conducted by thousands of parish gentry across the country, many unpaid. Second, many *local* public goods and services, including highways, ports, and poor relief, were provided by statutory authorities licensed by Parliament. In the following two sections, we make an effort to quantify the scale and paid status of both categories in 1700 and 1835.

The Land Tax. Most literature on the organization of the British fiscal state focuses on the increasingly ‘Weberian’ administration of the Excise, and to a lesser extent Customs and the Treasury (Brewer, 1989). Yet in 1700, and even to an extent in 1835, a substantial share of state revenue was generated by land taxation (40 percent in 1700). As described by Pierpoint (2018), the land tax administration was highly decentralized. A minimal staff of administrators in London coordinated the efforts of tens of thousands of local and often unpaid officials to assess properties and collect revenues.

The total number of land tax officials and their compensation are not known exactly. The following section outlines the organization of the land tax and estimates total employment in each tier.

- **Commissioners (unpaid):** Parliament appointed thousands of unpaid commissioners by county or city to administer the tax. Approximately 12,600 were named in 1700, and likely 70,000 in 1835. However, many of these officials would not have been active at any one time. Case study evidence from Pierpoint (2018) suggests that around half of commissioners in London and Bristol were active around 1700. The total *number* active did not appear to rise during the eighteenth century, nor in rural samples. We therefore (perhaps conservatively) assume 6,000 active commissioners for both years.

- **Assessors (unpaid) and Collectors (paid):** The commissioners appointed unpaid assessors and paid collectors (paid out of poundage) at the parish level. The 1700 statute required two assessors and two collectors to be appointed per parish. In practice, many people held both offices, especially by the late eighteenth century. For instance, in Wingham, East Kent, c. 1780, there were 10 assessors, 6 collectors, and 96 holding both offices. In Bristol and London, the offices tended to be separate. Historical evidence also suggests that the numbers of officers per parish declined and assessors and collectors became more likely to hold the same office. For a conservative estimate, we suggest 2.5 officers per parish in 1700 (25,000 total), of which 75 percent were paid, and 1.5 officers per parish in 1835 (23,880 total) with 90 percent paid.
- **Clerks (paid):** One paid clerk worked for every land tax division, of which there were likely around 700.

Summing up, we find that there were likely 31,700 officers involved in the land tax in 1700, of which 61.4 percent were paid. For 1835, we have 30,580 officers, with 72.6 percent paid.

Statutory Authorities. Some public goods were provided outside the remit of the borough, parish, and county. Largely after 1700, Parliament empowered four main kinds of independent statutory bodies to undertake public works (Webb and Webb, 1922). These were the turnpike trusts, Improvement Commissioners, Commissioners of Sewers, and the Incorporated Poor Law Guardians. We describe and estimate the size of each type of organization in turn.

Turnpikes Turnpike trusts were statutory authorities that ran toll-funded highway roads across the countryside. There were very few in 1700, when most highway maintenance was done by county JPs, but they became very common by the early nineteenth century. Each turnpike had a fairly regular set of permanent officers: a clerk, a treasurer, a surveyor, and a collector of tolls. There were 5 turnpikes (122 miles) in 1700 and 1,119 (19,798 miles) in 1835 (House of Commons, 1835). Turnpikes also employed gatekeepers. There were nearly 5,000 gates in 1835. Assuming a constant ratio of gates per mile, we find that there were 31 gatekeepers in 1700. Governance functions, meanwhile, were performed by a set of trustees who were statutorily prohibited from making profits.⁸ A sample of 56 trusts from four counties from House of Commons (1821) shows that there were about 45 trustees per trust.⁹ We consider that only 10 percent were likely active at any one time. Therefore, we take 23 trustees in 1700 and 5,036 in 1835.

⁸Bogart (2005) has noted that trustees likely benefited in other ways, e.g., by increasing the value of their lands.

⁹The four counties sampled are Bedfordshire, Berkshire, Buckinghamshire, and Cambridgeshire.

Improvement and Harbor Commissions Parliament also began to authorize bodies to assist with lighting, paving, and watching boroughs, as well as managing harbors. Webb and Webb (1922) suggest that there were 5 in 1700 and around 325 in 1835. Most commissions consisted of a number of unpaid commissioners, who employed a small core of paid, full-time officers, e.g., a treasurer and a surveyor, and contracted out their cleaning, paving, and lighting functions (Webb and Webb, 1922, pp. 308–310, 339–343). A few towns (Birmingham and Manchester chiefly) did have large paid staffs, but these were the exception.¹⁰ Based on this evidence, we assume that, at any one time, there were eight active (unpaid) commissioners and 12 paid officers. These relatively low numbers reflect the fact that many commissioners and watchmen (the largest category of additional paid officer) are captured directly in the borough data. We close, then, with 40 unpaid and 60 paid officers in 1700, and 2,600 unpaid and 3,900 paid in 1835.

Courts of Sewers Commissioners or Courts of Sewers administered land drainage, embankments, and sluices. They appointed small permanent staffs, including clerks, surveyors, collectors, treasurers or expeditors, bailiffs, sluice-keepers and other officers. The total number of courts is unknown, but thought to be less than a hundred and probably around 80 (Webb and Webb, 1922, p. 39). The total number of (unpaid) commissioners was likely between 3,800 and 5,800, but the number active at any given time was probably around 10 per commission. We also assume that there were 10 paid officers per court.¹¹ Assuming that there were 80 Courts of Sewers in both 1700 and 1835, we therefore suggest that they employed around 1,600 individuals, of which half were paid.

Incorporated Guardians of the Poor Incorporated Guardians were bodies that administered poor relief, including outdoor relief, workhouses, and sometimes poor-rate assessment and collection. The Webbs identify 11 incorporations by 1700 and approximately 126 established altogether by 1835 (Webb and Webb, 1922, pp. 109–115). We use 110 surviving incorporations in 1835, subtracting the 16 old incorporations dissolved during the initial implementation of the Poor Law Amendment Act. This is reflective of the state of poor relief on the eve of the institution of the Poor Law Unions in 1834. We assume five active unpaid guardians or directors and six paid officers per incorporation, producing 121 officers in 1700 and 1,210 in 1835.¹²

¹⁰In Birmingham, there were at least 138 paid employees in 1829. Manchester had at least 42 employees documented by the early nineteenth century, and likely many more in 1835 (Webb and Webb, 1922, pp. 253–69).

¹¹Romney Marsh and East Kent had over 20 officers each; smaller commissions like Greenwich or Holborn had closer to five (Webb and Webb, 1922, pp. 34–67, 87–94).

¹²Although rural bodies formally contained large numbers of guardians and directors, their work was generally conducted by committees of approximately five. Their paid establishments ordinarily included a clerk, treasurer, master or governor, chaplain, and several medical officers; larger institutions also employed matrons and school staff (Webb and Webb, 1922, pp. 132–135).

Summing Up

The preceding analysis allows us to add two additional rows to Table O.A.4. The results can be seen in Table O.A.5 below.

	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	1.67	1.21	90.22
Borough	7,660	12,268	0.51	0.36	70.69
Total (Local)	82,744	148,782	5.52	4.38	94.89
Land Tax	31,700	30,580	2.11	0.90	27.43
Statutory Authorities	1,895	23,822	0.13	0.70	37.72

Table O.A.5: Estimated Administrative Positions, Male-Population Shares, and 1835 Unpaid Shares by Layer of Government

O.A.3 Tenure and Rotation

Goldie (2001, p. 161) offers another, more provocative 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) 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 positions 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 33.17 percent of positions 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 positions: 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 positions:** 33% 1 holder per decade, 67% 7 holders per decade
2. **JPs, militia officers, other county offices:** 2 holders per decade
3. **jurors:** 10 holders per decade
4. **parish positions:** 7 holders per decade

For 1700, then, we see a grand total of 518,543 officeholders, and for 1835, we get 892,088.

Taking the population figure of 1,500,000 for 1700, our calculations suggest that 34.6% of adult males held some local position in any given decade. The 1831 census reported 3,394,638 adult males in England and Wales; this gives us 26.3% 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 each central-government position had two distinct holders per decade, equivalent to an average tenure of roughly five years, either because of firings/political patronage or promotion. Then two individuals would hold each central-government position in a given decade, giving us 9,840 officeholders in 1700 and 42,610 in 1835, or 0.66 and 1.26% 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	0.66	1.26
Parish	50,000	95,520	23.33	19.70
County	25,084	40,994	8.68	4.77
Borough	7,660	12,268	2.56	1.81
Total (Local)	82,744	148,782	34.57	26.28

Table O.A.6: Central and Local Positions as Shares of *Decadal* Adult-Male Population

O.A.4 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). Their governing body, known as the corporation, arose likely by custom (Maitland, 1898). For example, the Webbs, in their multi-volume 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 were self-governed, potentially creating variation between boroughs in their organization. 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 from 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 significant heterogeneity in the rights that charters created or that custom established. Sweet points out that “[t]he 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 both appointed its members and instituted other positions within the borough, appointing the officers holding these. The members of the corporation were simultaneously the local politicians, making decisions on borough policy, and part of its bureaucrat corps. They frequently, for example, sat as judges or were involved with finances.

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 tax property and other things with some flexibility, “[i]n 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 that could generate income, but there were often further restrictions on doing so. 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).¹³

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, the corporation was “largely made up of” merchants—“a powerful body of wealthy magnates” (Webb and Webb, 1908, p.450). This

¹³There is absolute consensus among scholars on this topic. For example, Hennock (1963, p. 214) writes that “[a] remarkable feature of these bodies was the narrow financial foundation on which most of them were reared.” See also Keith-Lucas (1980, p. 32).

was typically the case in coastal boroughs, like Great Yarmouth (Gauci, 1996), Ipswich (Clemis, 1999), or Liverpool. In other places, more traditional 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 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). 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).

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. They could, in turn, decide to institute further positions, depending on the availability of funds to pay these, or on their ability to provide non-monetary incentives.

Elites sought positions in the borough because they 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 positions 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 position – including the mayoralty – was not just a recognition of social standing but in itself an 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 a 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.” Some positions were part-time, and might be held in addition

to another occupation (e.g., in the trades) in the town.

Case study evidence further establishes the potential link between members of the corporation and ‘getting into society,’ especially the House of Commons. As the *Times* newspaper put it in 1833, there was “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).

Finally, aside from being selected from certain segments of society, the members of the municipal corporation were often relatively wealthier (Garrard, 1983; Gauci, 1996; Clemis, 1999). The corporations also often contained the gentry, as we saw in Gloucester: “[t]hroughout 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).

Taken together, boroughs were run by a ‘municipal corporation’, or a council, which appointed officers in the borough.¹⁴ Unpaid members of the council and officers may, in part, have been motivated to take up such positions by prestige and recognition, as well as by the prospect of moving up the political ladder. This political system may have evolved this way in the absence of a steady flow of income. We did not discuss in this section the enormous variation in performance between boroughs. Whereas some, such as the corporation of Liverpool, managed a bustling global harbor, others were not able to preserve order.¹⁵ We now introduce the data we use to measure the performance of paid and unpaid positions. We also introduce the data we use to study the organization and selection of the unpaid bureaucratic workforce.

¹⁴A remaining issue is the presence of parishes within boroughs. Oftentimes, a borough encompassed several parishes, which, in an urban context, were often named after (the church of) a particular saint, such that Bedford St. Michael would be a parish centered around the church of St. Michael within Bedford. These parishes did provide public goods. Most centrally, they were responsible for the implementation of the Poor Law. See Trotter (1919) for a detailed description of parish governance. We cannot measure parish governance or any variation within boroughs across parishes. Our empirical strategy compares positions within a borough, and any between-parish (geographical) variation is unlikely to affect our estimates.

¹⁵This variation can be best observed in the general discussion of the performance of the borough in the report we use to measure employment structure in this paper. We therefore discuss how to measure borough performance after we introduce our report.

O.B Data: Details

O.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 categories. 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.

O.B.2 Position-Task Data

Appendix Table O.B.1 shows descriptive statistics.

Table O.B.1: Position-Task Data

Position	# Boroughs	# Positions	Share Unpaid	Avg Tasks	Most Common Task
Constable	202	1093	0.57	1.09	Law Enforcement
Town clerk	180	188	0.24	1.29	Clerical
Mayor	163	182	0.49	2.25	Judicial
Recorder	132	169	0.62	1.34	Judicial
Serjeant at mace	119	270	0.07	1.24	Law Enforcement
...	...	...	...	...	...
Ale taster	1	2	1.00	1.00	Law Enforcement
Apothecary	1	2	0.00	1.00	Prison
Approved man	1	10	1.00	1.00	Governing
Assessor	1	5	0.00	1.00	Infrastructure
Auctioneer	1	1	0.00	1.00	Financial Corp.

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

O.B.3 Borough Data

Appendix Table O.B.2 shows descriptive statistics.

Table O.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)	0.69	0.46	0.00	1.00
Seaport (1680)	0.18	0.38	0.00	1.00
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.

O.B.4 Task Performance Data

Appendix Table O.B.3 shows descriptive statistics.

Table O.B.3: Performance Data

Task	Binary Outcome	Mean	Range	Cutoff
Governance	Overall performance assessment	0.69	[0, 7]	6
Justice	More than two courts held	0.70	[0, 9]	3
Infrastructure	Borough lit or paved	0.68	[0, 2]	1
Clerical Work	Borough reported more than three documents	0.62	[0, 137]	4
Financial Management	Borough keeps accounts	0.89	[0, 1]	1
Prison	Gaol reported adequate	0.30	[0, 3]	2
Law Enforcement	Police reported adequate	0.39	[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.

O.B.5 Incentive and Selection Data

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

Figure O.B.1: Prestige and Position 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<i>l.</i> 13<i>s.</i> 4<i>d.</i>; a fee of 6<i>d.</i> on sealing writs in the court of record, and, as coroner, a fee of 13<i>s.</i> 4<i>d.</i> 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<i>l.</i> 2<i>s.</i>, and 10<i>l.</i> 10<i>s.</i> 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<i>l.</i> 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<i>s.</i> 4<i>d.</i>
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<i>l.</i>, a livery, and a fee of 1<i>s.</i> 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 impanel 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<i>l.</i>; 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: Figure illustrates how position lists are ordered in terms of prestige. Heads of the corporation (here, the mayor) and judges (here, the recorder) are listed first; support positions, here the water-bailiff and town crier, come toward the end.

Table O.B.4: Incentive Data

Variable	Mean	SD	Min	Max
Prestige	0.48	0.31	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 position incentive data introduced in Section 5. Each row presents one variable. We record the mean, standard deviation, min, and max of each variable.

Table O.B.5: Selection Data

Variable	Mean	SD	Min	Max
Gentry	0.45	0.50	0	1
Clergy	0.01	0.12	0	1
Political	0.75	0.44	0	1
Economic	0.26	0.44	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.

Table O.B.6: Corruption Data

Variable	Mean	SD	Min	Max
Nepotism	0.11	0.31	0	1
Bribery	0.13	0.33	0	1
Self-Appointment	0.22	0.42	0	1
Vote Rigging	0.11	0.31	0	1

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

Figure O.B.2: Position-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.
Wenloch. 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 positions highlighted in different colors. Corruption category is 'misconduct.'

Figure O.B.3: Position-Level Patronage

Shaftesbury. Noble recorder; II. 1353.

Stamford. Exclusion from aldermanship by opposition to Exeter interest; IV. 2528.—Self-election of capital burgesses dictated by; 2528.—Marquis of Exeter; recorder; 2528.—Use of authority, as lord of the manor, against political opponents; 2530.—Employment of labourers as constables during election; 2533.—Opposition to beneficial inclosure of common fields on political considerations; 2534.—Recapitulation and effects; 2537–8.

Swansea. Lord's control over the corporation, by his steward's veto on all corporate appointments; working of this system; political purposes to which applied; payment of voters; expenses out of corporate funds; I. 392. See *Constitution*.

Tenby. Corporation a strictly exclusive party engine; I. 406.

Thetford. Election of mayor, principal burgesses and commonalty burgesses under the influence of two neighbouring families; IV. 2541, 2542.—Unbounded influence; transference with property; appointments; pensions; mayor's salary, and money tickets to support; local advantages and disadvantages; exclusion of inhabitants; 2547.

Totnes. Long subjection of borough to; family exercising; cessation of; effects during continuance; I. 643.

**Tregony.* Succession of patrons; corporate influence subject to; I. 650.

**Ush.* Till Reform Act, absolute control by lord of borough; I. 415–16.

Warwick. Strong opinion of the corporation's long subjection to the Earls of Warwick; the "Castle influence;" letters of the Earl of Warwick; III. 2069.

Note: Distinct positions highlighted in different colors. Corruption category is 'political patronage.'

O.C Unaffordability Robustness

Unaffordability Construction The headline unaffordability variable v_{bp} relies on two components: (1) predetermined rental income and (2) a central-government salary benchmark for each task profile. One concern is that the specific functional form of (2), rather than (1), drives the relevant variation in the variable. The same concern applies to the observed-wage construction we use as a robustness check, which adds market wages and a salary-prioritization ranking. Figure 8, Panel B suggests that this is not the case, given the balance of v_{bp} on predetermined position observables.

We provide further evidence to this end. First, we show that unaffordability calculated under true rental incomes, v_{bp} , is more predictive of unpaid status than unaffordability calculated under counterfactual rental incomes $\tilde{v}_{bp}$. We randomly reassign rental income within counties and predict unpaid status u_{bp} using counterfactual unaffordability $\tilde{v}_{bp}$ 1,000 times. Appendix Figure O.C.1 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 that the result is robust to how affordability is constructed. We prioritize the concern that positions and their tasks are created in anticipation of payment, using a position’s modal (predetermined) tasks and the charter subsample; we then vary the central-salary construction and whether it is compared against rental or total borough income; and we finally rebuild the benchmark from the wages boroughs actually paid. Each variant and its construction are described alongside the tables below, and results are qualitatively similar to the main results in Table 5 throughout.

Third, we investigate the complier sample. Appendix Figure O.C.2 visualizes our approach. It plots a histogram of mean affordability across counterfactual rental income. Some positions are never or always affordable, as indicated by the mass of the distribution at the end points. The figure also highlights our complier sample. As intended, positions that are always affordable or never affordable under counterfactual rental incomes are excluded, while positions whose affordability status changes across counterfactuals are retained. Appendix Table O.C.4 shows that results from the unrestricted sample are qualitatively very similar to results obtained in the complier sample. Appendix Table O.C.15 shows results from defining compliers as positions outside the lowest and highest quartiles of average paid status across boroughs.

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 O.C.16 shows that results are robust when omitting financial tasks from the estimation. Appendix Table O.C.17 decomposes predetermined income into rents, tolls, rates, and fines, and shows that only the rent leg relates to perfor-

mance.

Substitution Another concern involves substitution along the extensive margin — such as boroughs reallocating tasks across positions or reducing the number of positions — which could affect team assignment, w_{bpt} . To address this concern, we use institutional constraints embedded in borough charters, which mandated the presence of specific positions. We subset our data to just positions that were specified in the charter, and just to the modal task of each position. We repeat the construction of unaffordability using charter positions and modal tasks. Appendix Table O.C.3 shows that results are robust to using this predetermined set of positions.

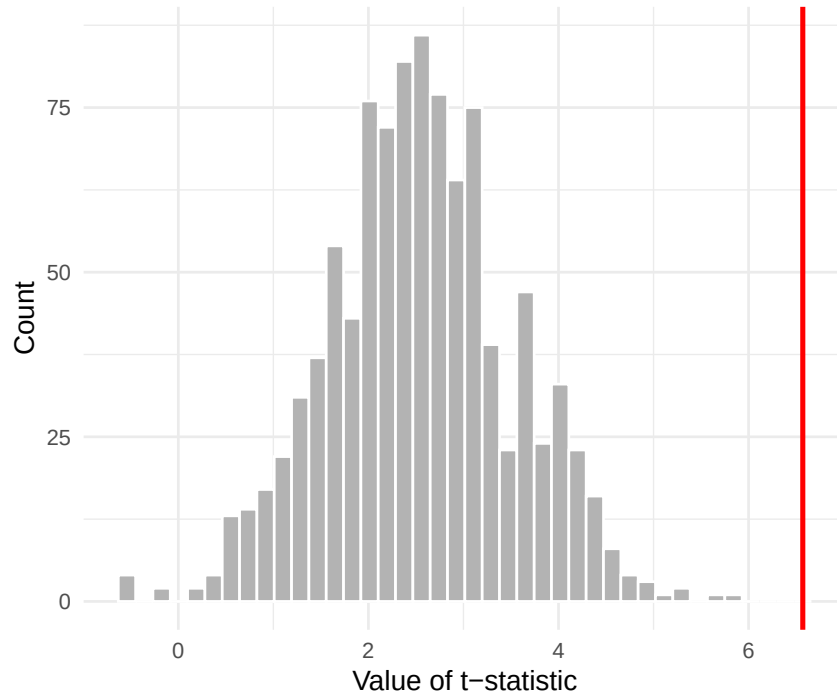
Table O.C.1: Comparing Wages With Market Wages

Borough	Population	Position Title	Wage (£)	Local Wage (£)	Global Wage (£)	Tasks
Liverpool	165175	mayor	600.00	600.00	25.00	Governing, Judicial
		town clerk	813.96	813.96	900.00	Clerical, Financial, Law enforcement
		constable	49.40	49.40	7.64	Law enforcement, Prison
Leeds	123393	mayor	0.00	50.00	41.70	Governing, Infrastructure, Judicial
		town clerk	21.00	21.00	10.50	Clerical, Judicial
		constable	80.88	5.40	13.56	Law enforcement
Norwich	61096	mayor	300.00	300.00	41.70	Governing, Infrastructure, Judicial
		town clerk	0.00	490.00	30.00	Clerical
		constable	16.25	16.25	13.33	Law enforcement
...	...	...	...	...	...	...
Yarmouth	586	mayor	0.00	51.39	9.58	Governing
		town clerk	6.30	6.30	10.50	Financial
		constable	0.00	2.60	13.45	Law enforcement
Fordwich	487	mayor	0.00	51.39	9.58	Governing
		town clerk	0.00	57.75	30.00	Clerical
		constable	0.00	36.00	13.33	Law enforcement
Newtown	68	mayor	0.00	51.39	9.58	Governing
		town clerk	0.00	17.77	10.00	Financial
		constable	0.00	17.33	13.33	Law enforcement

Note: This table compares the wages of three common position titles—the mayor, town clerk, and constable—with local and global *market* wages across three of the largest and smallest boroughs in our sample.

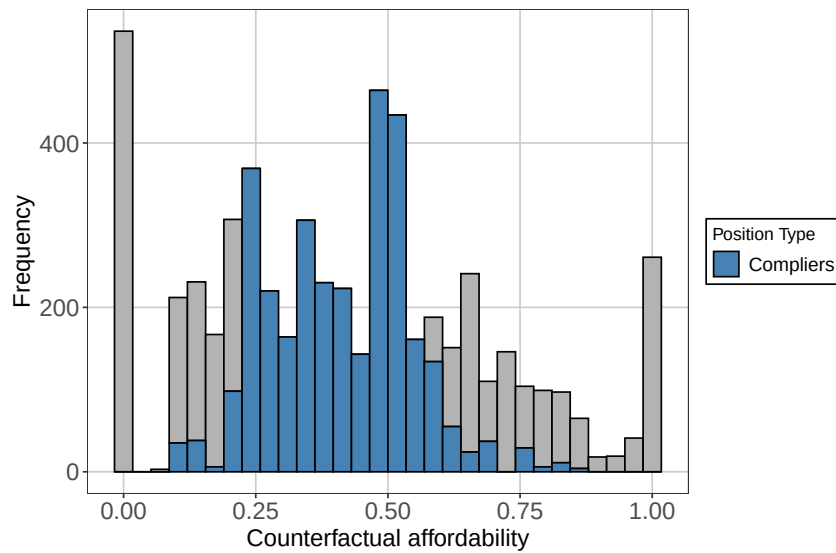
Priority Robustness We first address the concern that positions and their tasks may be created in anticipation of payment. Appendix Table O.C.2 defines a position’s team membership by its modal, predetermined tasks (given its title) rather than by its actual task assignment. Appendix Table O.C.3 restricts the sample to chartered positions, which were always filled, again on their modal tasks. Both use the headline measure, the central midpoint salary for the task profile compared against predetermined rental income, and both give a similar relationship.

Figure O.C.1: Unaffordable and Unpaid Status (Randomization)



Note: Figure shows t-statistics associated with 1,000 OLS regressions of the form $u_{bp} = \beta_0 + \beta_1 \tilde{v}_{bp} + \varepsilon_{bp}$. $\tilde{v}_{bp}$ is obtained by randomly reassigning rental income within counties and re-calculating affordability as detailed in Section 4.3. The red line indicates the t-statistic associated with v_{bp} under the true rental income of each borough. Observations are at the level of a position. The sample comprises 5,710 positions.

Figure O.C.2: Affordability Across Counterfactuals and Complier Status



Note: Figure shows a histogram of average affordability of each position across 1,000 counterfactuals, $\tilde{v}_{bp}$. This variable is obtained by randomly reassigning rental income within counties and re-calculating affordability as detailed in Section 4.3. The plot highlights the fraction of each bin that is in our complier sample, as defined in Section 4.3. Observations are at the level of a position. The sample comprises 5,710 positions.

Table O.C.2: Unaffordable and Performance (Modal Tasks)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on (Modal) Team	0.19*** (0.03)	0.19*** (0.03)	0.19*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , with team membership defined by a position's modal, predetermined tasks rather than its actual task assignment. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.3: Unaffordable and Performance (Charter Positions)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on (Modal) Team	0.23*** (0.07)	0.17*** (0.06)	0.17*** (0.06)
Observations	12,026	12,026	12,026
R^2	0.37	0.45	0.45
Boroughs	137	137	137
Positions	1718	1718	1718
Tasks	7	7	7
Outcome Mean	0.64	0.64	0.64
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

Alternative Central-Salary Constructions We next vary the affordability construction along two dimensions: whether positions are ordered by fraction paid and cumulated into a running borough budget, and whether the salary is compared against predetermined rental income or total borough income. Appendix Table O.C.4 applies the headline measure (central midpoint salary, no ordering, rental income) to the full sample. Appendix Table O.C.5 orders positions and cumulates the central minimum salary against rental income; Appendix Table O.C.6 compares the central midpoint against total income without ordering; and Appendix Table O.C.7 combines ordering of the central minimum with total income. Appendix Tables O.C.8 and O.C.9 instead match the central salary to a position by its officer title and by the average of its component tasks, and Appendix Table O.C.10 replaces the binary indicator with the continuous log ratio of the central salary to borough income. The estimated relationship is positive and significant throughout.

Table O.C.4: Unaffordable and Performance (Full Sample)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.17*** (0.03)	0.16*** (0.03)	0.17*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

Observed Market-Wage Benchmarks Finally, we rebuild the salary benchmark from the wages boroughs actually paid rather than from central pay, pooling comparable positions in different ways. Appendix Tables O.C.11, O.C.12, and O.C.13 pool positions within the same county, outside the county, and

Table O.C.5: Unaffordable and Performance (Central Minimum, Cumulative Budget)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.09*** (0.03)	0.09*** (0.02)	0.09*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , where the position wage is the minimum of the central salary range and affordability is computed with the salary-prioritization ranking and cumulative borough budget. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.6: Unaffordable and Performance (Central Midpoint, Total Income)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.13*** (0.04)	0.12*** (0.04)	0.13*** (0.04)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , where each position is priced at the midpoint of its central salary range with no cumulative ordering (as in the headline measure) and this salary is compared against total borough income rather than predetermined rental income. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.7: Unaffordable and Performance (Central Minimum, Total Income)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.13*** (0.03)	0.12*** (0.03)	0.13*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , where the position wage is the minimum of the central salary range, affordability uses the salary-prioritization ranking and cumulative borough budget (as in Table O.C.5), and the budget is compared against *total* borough income rather than predetermined rental income. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.8: Unaffordable and Performance (Central Salary by Officer Title)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.16*** (0.03)	0.15*** (0.03)	0.15*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , where the central salary is matched to a position by its officer title. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.9: Unaffordable and Performance (Central Salary by Task Average)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.16*** (0.03)	0.15*** (0.03)	0.15*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} , where the central salary for a position is the average of the central salaries of its component tasks. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.10: Unaffordable and Performance (Continuous Salary Burden)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.03*** (0.005)	0.03*** (0.004)	0.03*** (0.005)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with the continuous salary burden $\log(\text{central salary/borough income})$. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

among charter positions, respectively,¹ and Appendix Table O.C.14 places the all-borough, within-county, and out-of-county benchmarks side by side.

Table O.C.11: Unaffordable and Performance (Local Comparison)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.07*** (0.03)	0.08*** (0.03)	0.08*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

¹In rare cases we cannot form a task-profile-specific market wage (for example, because there is no paid position doing governing and law enforcement mentioned in any charter). In these cases, we impute wages using the sample mean.

Table O.C.12: Unaffordable and Performance (Global Comparison)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.11*** (0.03)	0.11*** (0.03)	0.11*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

Table O.C.13: Unaffordable and Performance (Charter Comparison)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.11*** (0.03)	0.11*** (0.03)	0.11*** (0.03)
Observations	39,970	39,970	39,970
R^2	0.33	0.39	0.39
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	7	7	7
Outcome Mean	0.61	0.61	0.61
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

Table O.C.14: Unaffordable and Performance (Market-Wage Benchmarks)

	Performance		
	Baseline (all)	Local (county)	Global (out-of-county)
	(1)	(2)	(3)
Unaffordable Position on Team	0.112*** (0.029)	0.080*** (0.026)	0.107*** (0.028)
Observations	39,970	39,970	39,970
R ²	0.39	0.39	0.39
Wage benchmark	all boroughs	same county	other counties
Boroughs	258	258	258
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects	✓	✓	✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} under three observed-pay market-wage definitions: an all-borough average, a local within-county average, and a global out-of-county average. The paper's baseline uses the central-government salary benchmark instead. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.15: Unaffordable and Performance (Alternative Complifiers)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.21*** (0.04)	0.19*** (0.04)	0.20*** (0.04)
Observations	24,164	24,164	24,164
R ²	0.33	0.39	0.40
Boroughs	250	250	250
Positions	3452	3452	3452
Tasks	7	7	7
Outcome Mean	0.60	0.60	0.60
Cluster	Borough × Task	Borough × Task	Borough × Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

Note: The table presents results of estimating equation (1), replacing observed unpaid status u_{bp} with predicted unaffordability v_{bp} and subsetting to an alternative set of complier positions as described in the text. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Table O.C.16: Unaffordable and Performance (Task Subset)

	Performance		
	(1)	(2)	(3)
Unaffordable Position on Team	0.18*** (0.03)	0.17*** (0.03)	0.17*** (0.03)
Observations	34,260	34,260	34,260
R^2	0.32	0.38	0.38
Boroughs	258	258	258
Positions	5710	5710	5710
Tasks	6	6	6
Outcome Mean	0.56	0.56	0.56
Cluster	Borough $\times$ Task	Borough $\times$ Task	Borough $\times$ Task
Task Control	✓	✓	✓
Controls		✓	✓
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects			✓

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

Table O.C.17: Performance and Components of Predetermined Income

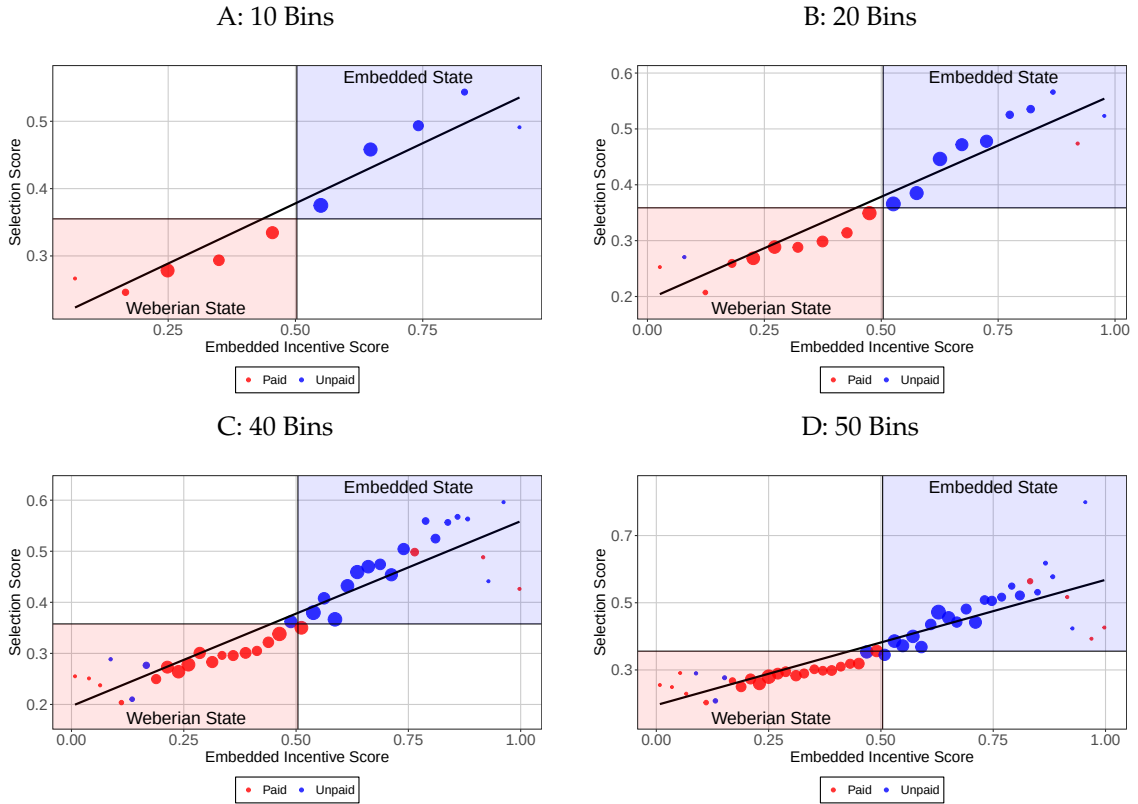
	Performance		
	Rents	Tolls	All components
	(1)	(2)	(3)
Rents (log)	0.036*** (0.009)		0.032*** (0.011)
Tolls (log)		0.015* (0.008)	0.009 (0.008)
Rates (log)			0.004 (0.006)
Fines (log)			-0.011 (0.009)
Observations	88	88	88
R ²	0.31	0.24	0.32

Note: Borough-level OLS from the item-level accounts, regressing borough performance on log predetermined income split into rents (the endowment leg used to construct unaffordability), tolls, rates, and fines, controlling for log population, the 1332 lay subsidy per capita, and seaport status. Observations are at the level of a borough. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

O.D Incentive and Selection Robustness

Appendix Figure O.D.1 shows versions of Figure 9 with varying bin sizes. Appendix Table O.D.1 shows the correlation between incentive and selection indices. Appendix Figure O.D.2 shows a decomposition of the main performance estimation of Table 4 into positions held by officers with and without a title, demonstrating that the effect of unpaid status is concentrated in those positions held by officers with a title. Finally, Appendix Figure O.D.3 shows a decomposition of the main performance estimation of Table 4 into positions with and without associated corruption, demonstrating that the effect of unpaid status is not concentrated in corrupt positions. Appendix Table O.D.2 reports the tabular counterpart of the selection split, with the advantage concentrated among positively selected officers and a precise zero among the non-selected. Appendix Table O.D.3 shows the name-based political-elite result survives dropping the most common surnames (the “Smith” problem).

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



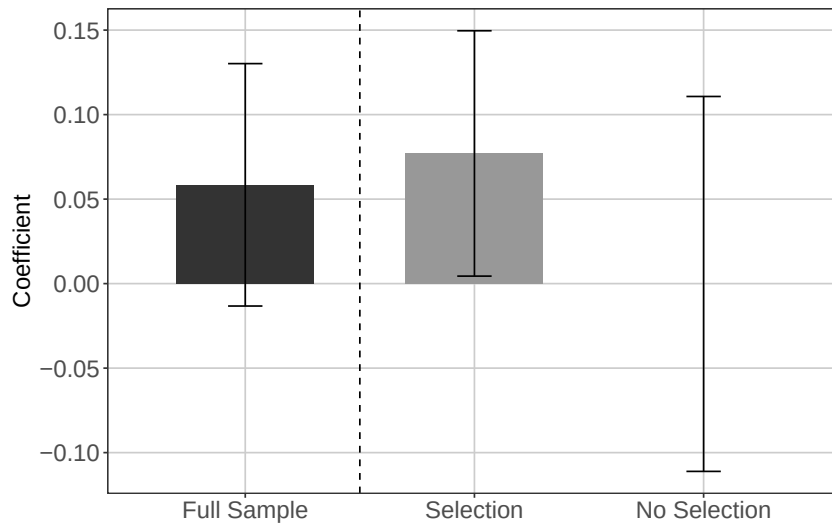
Note: The figure presents results of estimating equation (5) in a binned scatterplot using 10, 20, 40, and 50 bins, respectively, in Panels A–D. The x-axis plots the incentive index, and the y-axis the selection index introduced in Section 5. Vertical and horizontal lines indicate the respective conditional means. Unpaid bins are represented by blue circles, while red circles denote paid bins. We adjust the size of each bin to reflect the number of underlying observations. Observations are at the level of a position. The sample comprises 5,710 positions.

Table O.D.1: The Embedded State Within Boroughs

	Selection Index		
	(1)	(2)	(3)
Incentive Index	0.35*** (0.02)	0.35*** (0.02)	0.36*** (0.02)
Observations	5,710	5,710	5,710
R^2	0.30	0.30	0.45
Boroughs	258	258	258
Outcome Mean	0.19	0.19	0.19
Cluster	Borough	Borough	Borough
Controls		✓	✓
Borough fixed effects			✓

Note: The table presents results of estimating equation (5). Observations are at the level of a position. The sample comprises 5,710 positions. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is the selection index introduced in Section 5.

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



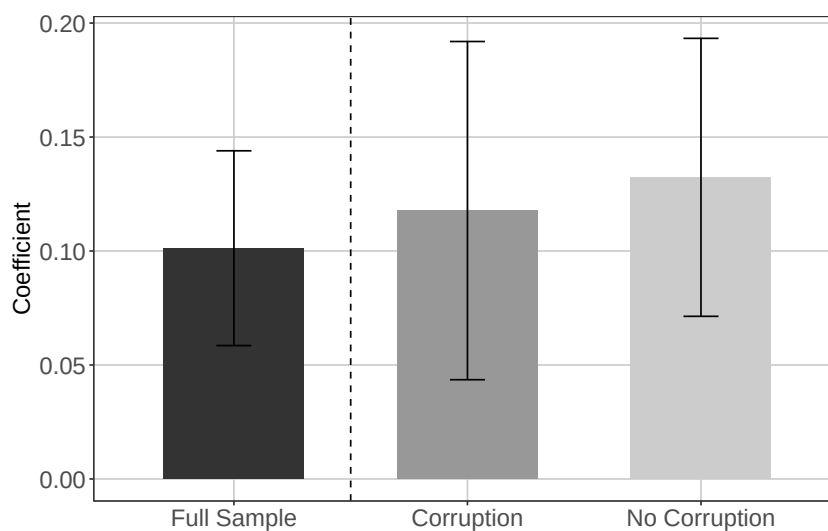
Note: The figure presents results of estimating equation (1) in a subset of positions held by officers with known names. The left bar shows the main coefficient in the named sample. The middle bar shows the main coefficient in a sample of positions held by officers with a title. The right bar shows the main coefficient in a sample of positions held by officers without a title. Observations are at the level of a position-task. The sample comprises 1,785 (left bar), 967 (middle bar), and 818 (right bar) positions.

Table O.D.2: Unpaid and Performance (Selection Split)

	Performance		
	Full (1)	Selected officers (2)	Non-selected officers (3)
Unpaid Position on Team	0.120*** (0.020)	0.093*** (0.033)	0.004 (0.045)
Observations	39,970	6,769	5,726
R ²	0.39	0.43	0.50
Subsample	all	elite/MP-linked	neither
Borough fixed effects	✓	✓	✓
Task fixed effects	✓	✓	✓
Position Title fixed effects	✓	✓	✓

Note: The table presents results of estimating equation (1), splitting the sample by whether an officer is positively selected (elite title or MP-linked last name); the tabular counterpart of Figure O.D.2. Observations are at the level of a position-task. The number of position-tasks and positions in each sample is indicated in the table. Standard errors are clustered at the borough-task level. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The dependent variable is borough-task performance, as introduced in Section 4.

Figure O.D.3: Performance of the Embedded State (Corruption Split)



Note: The figure presents results of estimating equation (1). The left bar shows the main coefficient. The middle bar shows the main coefficient in a sample of positions that are identified as corrupt in the report, as described in Section 3. The right bar shows the main coefficient in a sample of positions that are not associated with corruption. Observations are at the level of a position-task. The sample comprises 5,710 (left bar), 2,198 (middle bar), and 3,512 (right bar) positions.

Table O.D.3: Name-Based Political-Elite Selection and Common Surnames

	Political Elite	
	All surnames (1)	Excl. common surnames (2)
Unpaid	0.201*** (0.031)	0.455*** (0.045)
Observations	5,710	1,124
R ²	0.35	0.46
Positions	5,710	1,124
Borough fixed effects	✓	✓

Note: Position-level OLS with borough fixed effects, regressing the name-based political-elite indicator (shared last name with an MP or a militia commander) on unpaid status, on all surnames (Column 1) and dropping the top decile of surnames by frequency (Column 2). Observations are at the level of a position. *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

O.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 officers 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. Sander (1902) documents that out of roughly 141 municipal officers in fifteenth-century Nuremberg, 72 percent were salaried, while the remainder were either unpaid (17%) or paid in fees (11%). As in the English context, high shares of the governing body and judges were unpaid. While many police were unpaid, all officers involved in infrastructure or property management were compensated. State supervision was irregular and patrimonial, with royal officers 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 officers—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 positions from a status privilege into a civic obligation. At the same time, a modest corps of salaried clerks, treasurers, police officers, 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 officer, 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 officers. 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; 1901b; 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 officers within executive administration. Instead, it produced a sharp functional division: professional, salaried state administrators (prefects and sub-prefects) 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; B. 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 officers 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 (B. Chapman, 2024).

The United States

Origins Unsurprisingly, early American municipal governments closely resembled the English chartered corporations. Nearly all towns of sufficient size possessed a mayor, a common council (often in-

cluding 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 offer 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. By the twentieth century, 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

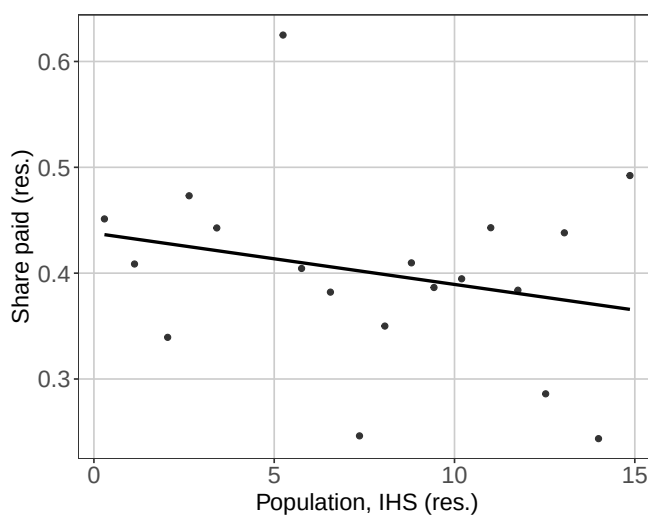
England’s largely unprofessional and autonomous local administration was, to an extent, mirrored in Prussia, France, and the United States before the French Revolution. At the municipal level, chartered corporations predominated, usually run by unsalaried (though not necessarily unpaid) local officeholders 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 positions 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.

O.F Paid Officials and Borough Size

Figure O.F.4: Paid Officials and Borough Population



Note: Binned scatter of the share of a borough's officials who were paid against borough population, the inverse hyperbolic sine of the 1831 census count, residualizing both axes on county fixed effects. Observations are at the level of a borough.

O.G Municipal Reform in Parliament

We use the parliamentary debates to study when and how contemporaries argued about the 1835 reform. We collect the index of Historic Hansard, the digitized record of debates in the House of Commons and the House of Lords, for every sitting between 1803 and 1860, a total of 40,506 debates (UK Parliament, 2026). We flag the debates whose title refers to the reform of municipal corporations and assign each to England and Wales, Ireland, or Scotland by its title, because the Irish and Scottish reforms were debated under similar titles. Of the 79 English debates between 1833 and 1836, Hansard reports text for 75; for these, we collect the text of all 1,421 speeches, split them into sentences, and assign each sentence to one or more of seven arguments by keyword. Hansard in this period reports speech in the third person; it is a summary by the reporter, not a verbatim record.

Panel A of Figure O.G.1 shows that Parliament debated municipal reform little before the Municipal Corporations Bill was introduced on 5 June 1835. No English debate before 1833 carries a reform title, and there are four in 1833 and 1834. Sixty-two debates followed between the first reading of the Bill and the end of 1835, and 26 more in 1836 and 1837. Of the 123 debates under these titles between 1836 and 1840, 96 concern Ireland or Scotland.

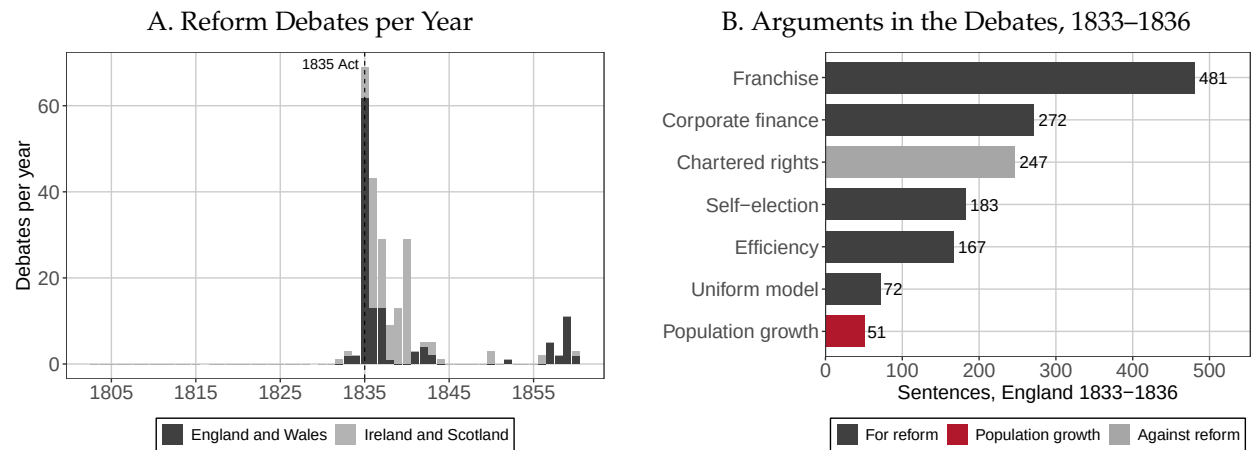
Panel B counts the sentences in these debates that mention each argument. The most frequent arguments are the franchise (481 sentences), corporate finance (272), chartered rights (247), and self-election (183). The keywords for population growth match 51 sentences, 3.7 percent of the 1,373 sentences with at least one argument keyword. One of these 51 sentences refers to the growth of towns; most mention large towns in passing, for instance where the Bill divides them into wards. Opponents also called the Bill a party measure, an argument the keywords do not count.¹

¹Candidate quotes, grouped by argument. Column numbers refer to the column in which the quoted passage begins. *Self-election*. “[H]e was decidedly of opinion, that the system of self-election in Corporations ought to be removed—that Corporations should be well governed—that corporate property should be well administered, and that those persons who had the deepest interest in the municipal government should, at least, have a voice in the choice of those who were to govern them” (Mr. Ireland Blackburne, HC Deb 15 June 1835, vol. 28, col. 830). “They are at present nothing but oligarchies, and accompanied by all the evils and miseries that have in all places and at all times, flowed from that system of Government” (Viscount Melbourne, HL Deb 3 August 1835, vol. 29, col. 1353). The report of the Commissioners on Nottingham, read out by Melbourne: “the political character of the select body, the exclusion of so many persons of respectability and intelligence, the abuse of the corporate franchise in the creation of freemen, the lavish and unprofitable expenditure of the corporate revenues, the secrecy of the financial proceedings [...] are so many causes of well-founded complaint” (HL Deb 3 August 1835, vol. 29, cols. 1346–47). *Corporate finance*. “It was a main principle of this Bill to take from the self-elected Corporations the control of the corporate funds, and to vest them in the control of the inhabitants of the borough, with whom, in his judgment, that control ought to rest” (Lord Stanley, HC Deb 15 June 1835, vol. 28, col. 823). From the first reading: “I now proceed to the method I propose to adopt, not for continuing these sinister and indirect practices, but for establishing really good government in corporate towns—that the people may exercise a vigilant control over the offices they have appointed, and that the funds may be administered honestly and fairly, and not diverted to favour the interests of individuals or to promote parliamentary speculations” (Lord John Russell, HC Deb 5 June 1835, vol. 28, col. 547). A petition from the inhabitants of Leicester, presented by Lord Brougham: “They demand, and justly demand, that an unlimited and irresponsible power of taxing and spending, such as even the Parliament of the United Kingdom does not claim, shall not be confided to persons in whom your petitioners have no trust, no confidence whatever” (HL Deb 12 August 1835, vol. 30, col. 325). Against: “It turned out, then, that this charge of mismanagement of the revenue did not so much apply to the close Corporations, against which this Bill was levelled, as to the open and popular Corporations, to which all the others were intended to be assimilated” (Lord Lyndhurst, HL Deb 3 August 1835, vol. 29, col. 1395). *Franchise*. “He could not have supported the second reading of the Bill had he not been

Together, the counts and the quotes suggest that contemporaries argued about the reform in political terms: who elected the corporation, who controlled its funds, and which party it returned. The debates record the arguments made in Parliament. They do not show which boroughs adopted the reform, the subject of Figure 11.

prepared also to accede to that which was in point of fact its chief feature—namely, the franchise which it proposed to give” (Lord Stanley, HC Deb 15 June 1835, vol. 28, col. 823). “[O]f all the evils of the present corporation system, the greatest was that which gave power to the few by the corruption of the many” (Mr. Vernon Smith, HC Deb 23 June 1835, vol. 28, col. 1089). *Chartered rights*. “The right to elect their chief Magistrate, and to elect representatives in the great Council of the nation, has been enjoyed by the freemen as a chartered right ever since the reign of Athelstan, and has been confirmed by succeeding Kings for many centuries, and now stands upon the same foundation as the right of every Peer and Peer’s son in this kingdom” (Mr. Stephen R. Lushington, HC Deb 20 July 1835, vol. 29, cols. 754–55). “If therefore he now attempted to continue that right, it did not arise from any desire to indulge in vain declamations about the privileges of the poor but from a wish to maintain that good faith which he thought pledged to the ‘perpetuation’ of the franchise” (Sir Robert Peel, HC Deb 16 July 1835, vol. 29, col. 659). *Party*. From the first reading: “[T]hey employed them in no manner for the good government and well-being of the boroughs—not that they might be ‘well and quietly governed,’ to use the words of some of the charters, but for the sole object of establishing an influence for the election of Members of this House” (Lord John Russell, HC Deb 5 June 1835, vol. 28, col. 547). “We think that there will no longer exist the feeling that the Corporations have been created for the exclusive benefit and advantage of one party in the town, and that all those who happen to differ in opinion from that party, or who are not favored by it, are harshly and unjustly dealt with” (Lord John Russell, HC Deb 5 June 1835, vol. 28, col. 557). “[T]hat the Reform be a sincere, bonâ fide Reform—that it be not a mere pretext for transferring power from one party in the state to another” (Sir Robert Peel, HC Deb 5 June 1835, vol. 28, col. 566). “[U]nder the pretence and colour of a Bill for the Reform of Municipal Corporations, it was a party job, intended to supply the deficiencies of the Reform Bill, and to destroy the Conservative party in the country” (Lord Lyndhurst, HL Deb 3 August 1835, vol. 29, col. 1401). “He repeated, that this Measure was not designed as a Reform of Municipal Corporations, but as a means to answer a particular party purpose. To their credit be it spoken, the Corporations of England had generally returned Conservative Members, the Corporations had rallied round those who were attached to the institutions of the country, and hence it was that they were to be destroyed” (Mr. Scarlett, HC Deb 20 July 1835, vol. 29, cols. 758–59). “He expressed his conviction that this Bill was brought forward for party purposes, and for party purposes only. It was intended to raise one party, and to depress another” (The Earl of Winchilsea, HL Deb 18 August 1835, vol. 30, col. 637). In reply: “He did not concur with many hon. Gentlemen in saying, that the Bill had been brought forward by his Majesty’s Government for party purposes; on the contrary, it had been brought forward with a view to open to every man civil honours and civil rights” (Mr. Philip Howard, HC Deb 7 September 1835, vol. 30, col. 1439). *Population growth*. The one sentence on the growth of towns: “Sir, when I look to the state of the population of the larger towns of this kingdom—when I contemplate the rapidity with which places, which at no remote period were inconsiderable villages, have through manufacturing industry, started into life and into great wealth and importance—when I look, too, to the imperfect provision which is now made for the preservation of order and the administration of justice in most of those towns—I cannot deny that the time has arrived when it is of the utmost importance to the well-being of society, to establish within societies so circumstanced a good system of Municipal government” (Sir Robert Peel, HC Deb 5 June 1835, vol. 28, col. 559). “Sir, I cannot contemplate the condition of some of the great towns of this country, and witness the frequent necessity of calling in the military in order to maintain tranquillity, without feeling desirous that the inhabitants of such towns should be habituated to obedience and order through the instrumentality of an efficient civil power, and a regular and systematic enforcement of the law” (Sir Robert Peel, HC Deb 15 June 1835, vol. 28, col. 831). “I confess, likewise, that there is another circumstance which induces me to consider a Reform in the Administration of the large towns at this moment as most essential to the interests of the country” (The Duke of Wellington, HL Deb 12 August 1835, vol. 30, col. 360). On Manchester: “They had, in fact, no Corporation at present, possessing merely the remains of a manor Court, which might have suited Manchester very well as a small hamlet, but was totally inapplicable to a great, populous, and flourishing town” (Lord Brougham, HL Deb 10 August 1835, vol. 30, col. 193). *Timing*. “They never before had evinced any symptoms of haste about Corporate Reform. They came into office in November, 1830, and they waited till July, 1833—two years and three quarters—before they even took their first step, by issuing their Commission for inquiry into the long-alleged abuses of the Corporations. After so long a period of delay, why did they now display such haste and anxiety?” (Mr. Horace Twiss, HC Deb 20 July 1835, vol. 29, col. 767). “[T]hat degree of knowledge and information which, from the degree of haste with which the measure was pressed forward, it was almost impossible they could have attained” (Lord Sandon, HC Deb 22 June 1835, vol. 28, col. 1013). “[T]hey had been obliged to bring forward their measure crude and undigested, in their eager hurry to propound some plan of so-called Reform, for the purpose of keeping the movement alive” (Lord Ashburton, HL Deb 27 August 1835, vol. 30, col. 1054).

Figure O.G.1: Municipal Reform in Parliament



Note: Data from the index and text of Historic Hansard (UK Parliament, 2026). Panel A counts the debates in the House of Commons and the House of Lords whose title refers to the reform of municipal corporations, including titles misspelled in the digitized index, by year. A debate is assigned to Ireland or Scotland if its title names the country or an Irish borough, and to England and Wales otherwise. The dashed line marks the Municipal Corporations Act of 1835. The digitized index contains no debates for 1816 and 1829. Panel B counts the sentences in the 75 English reform debates of 1833–1836 with recorded text that contain a keyword for each argument; a sentence can carry more than one argument. Example keywords: franchise (“franchise,” “ratepayer,” “suffrage”); corporate finance (“corporate fund,” “audit,” “corrupt”); chartered rights (“vested,” “chartered right,” “spoliation”); self-election (“self-elected,” “close corporation,” “oligarch”); efficiency (“efficient,” “good government,” “mismanage”); uniform model (“uniform,” “general system”); population growth (“increase of population,” “populous,” “large towns”).