A Glorious Transition?

The Politics of Market Access in Britain's Infrastructure Sector in aftermath of the Glorious Revolution

Dan Bogart

Department of Economics, UC Irvine, dbogart@uci.edu

And

Robert Oandasan

Compass Lexecon, roandasan@gmail.com

Abstract

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The Glorious Revolution of 1689 is one of the most hotly debated political transitions in history. In the aftermath the Whig and Tory parties traded places as the majority in the House of Commons six times between 1690 and 1715. Some scholars have suggested that political parties encouraged rent seeking in this fractious period. In this paper, we study whether parties influenced the allocation of infrastructure improvement rights in Parliament. We find evidence that constituencies were more likely to get a river improvement act if more of their representatives in the House of Commons were affiliated with the ruling party. We also find that groups in a constituency were more likely to oppose river improvement bills in neighboring jurisdictions if they were more strongly represented by the ruling party. Our conclusion is that party politics slowed some infrastructure projects in the post-Glorious Revolution period and accelerated others, imparting a political bias. More generally the results have implications for our understanding of the political economy of infrastructure and the economic effects of political transitions.

I.	Introduction

Political transitions are often crucial moments in an economies' development. By shifting power to new groups in society, political transitions can alter the protection of property rights, redistribute public resources, and change barriers to entry. History is useful for studying political transitions because one can see the long-run effects and the general forces at work. Along with the French Revolution, Britain's Glorious Revolution of 1689 is one of the most celebrated—and studied—political transitions in history (Rosenthal 1992, Acemoglu, Johnson, and Robinson 2011). The effects of the Glorious Revolution are far from settled however. One view is that by limiting the monarchy's powers and giving Parliament a larger voice, the Glorious Revolution resolved a long-standing conflict in Britain's political system (North and Weingast 1989). Indicators for activities that were most sensitive to political conflict, like government borrowing, taxation, legislative acts altering property rights, and transportation investment all have been shown to increase following the Glorious Revolution (cites).

While few would disagree that the political settlement of 1689 fostered some economic activity, there is a more sober view that the Glorious Revolution replaced one form of rent-seeking with another. Under the previous regime the Stuart monarchs favored economic groups who supported them politically and financially, including the famous English East India Company. After 1689 two political parties, the Whigs and Tories, are thought to have played a similar game. Allies of the Whigs came to control the so-called 'monied companies' like the Bank of England and the reconstituted East India Company. The Tories were notable in their affiliation with the South Sea Company and a failed attempt to create a Land Bank. Arguing along these lines, David Stasavage (2005) has shown that yields on government debt increased when the Tories were the majority party in the House of Commons because they wished to end

the extractions of the Whig-allied monied companies. If the political manipulation of markets was widespread in in the 1690s and early 1700s then Britain's transition to democratic political institutions was less than glorious.

This paper brings new methods and new data to this highly debated topic. It examines the role of party politics in the allocation of infrastructure improvement rights from 1690 to 1715. The infrastructure sector underwent a major change during late 1600s as Britain turned to public-private partnerships to improve its transportation network. Highway and river improvement are two prominent examples. Parliament passed acts establishing 'turnpike trusts' with rights to levy tolls on highways, purchase land, and issue bonds. River navigation companies were endowed with similar powers but they could also issue equity in the firm. In the long-run infrastructure authorities generated large economic gains by lowering transport costs, but they also threatened vested interests like local landowners and neighboring cities (Bogart 2005, 2009, more cites).

Turnpike and river navigation projects are particularly illuminating for understanding the economic effects of party because entry into the sector was controlled by Parliament. Projects were promoted by local interest groups, often landowners in the case of turnpike trusts or the city leaders in the case of river navigation projects. These groups submitted a petition to the House of Commons. The petition then became a bill which was reviewed by a committee of Members of Parliament or MPs for short. MPs on the committee could help promoters get their bill passed or they could assist vested interests who sought to kill the bill. Our premise is that the nature of this 'political exchange' depended on the geographic location of promoters, opposition groups, and representatives of the ruling party, either Whig or Tory.

We propose a novel theoretical framework to study the effects of ruling party representation. Our model examines the decision to promote infrastructure bills and the decision to fight bills by opposition groups. It also examines the assignment of ruling party representatives, known as Members of Parliament or MPs, to infrastructure bill committees and the decision by party leaders to approve or reject bills. We get three key predictions if association with the ruling party influenced the success rate for infrastructure bills and if the density of ruling party MPs in an area affected the matching cost with promoters and opposition groups. The first prediction is that ruling party MPs should be over-represented on infrastructure bill committees. Second, improvement bills and acts should be more likely and have a higher success rate in areas where infrastructure promoters are more represented by the ruling party. Third, opposition to bills should be more likely in areas where vested interests are more represented by the ruling party.

The empirical analysis uses a new data set on the political affiliation of all MPs serving in municipal or county constituencies between 1690 and 1714. We code whether the MPs in a constituency were part of the ruling party in each legislative session. The constituency party data is merged with a data set of turnpike and river navigation bills drawn from the *Journals of the House of Commons*. We know for each year and legislative session which constituencies had turnpike and river bills within their jurisdictional boundaries. We also know which of these bills succeeded in the legislative process and became acts of Parliament enabling the project to go forward.

The analysis shows some evidence that access to ruling parties affected the cost of promoting infrastructure bills. Our first results show that MPs were over-represented on committees. The probability an MP serving on a committee was affiliated with the ruling party is

found to be significantly greater than the share of ruling party MPs in the Commons. The results are robust to controls for other characteristics of MPs like profession and years of experience.

Next we study the probability a bill was introduced and passed in a constituency conditional on the fraction of MPs from the ruling party in the constituency or within 25 miles of the constituency. The main specification also includes constituency fixed effects and a time trend to control for unobservable factors. The results show little effect of party representation on turnpike bills or acts, but there is an effect on river navigation acts. Among the set of constituencies which got a river improvement act between 1690 and 1715, they were more likely to get it in a legislative session where their MPs were more affiliated with the ruling party. We also find that a river bill in a constituency was more likely to succeed if the constituency had more MPs from the ruling party. As a robustness check we also examine constituencies with close elections. Here one can argue that ruling party strength was more random because a small change in voting could have brought a different party into a constituency. Here the statistical significance is weaker, partly because of small sample size, but the magnitude of the coefficient is similar.

One limitation of the preceding analysis is that constituencies can contain promoters and opposition groups. If there is geographic overlap then our theoretical framework suggests that increasing party strength has potentially ambiguous effects because it simultaneously lowers the promoter's and the opposition's cost of matching with ruling party MPs. To address this issue we exploit detailed information on the locations of opposition groups. Among the constituencies that had bills introduced within a 50-mile radius, we test whether having more ruling party MPs increased the probability the bill was opposed by some group in the constituency. We find evidence for a positive association between ruling party density and opposition to river bills.

This result is significant given that opposition in Parliament significantly increased the cost of promoting bills.

Consistent with our theoretical framework we find some evidence that the geography of ruling party representation affected the cost of promoting river navigation projects. If an area had few ruling party MPs then the evidence suggests promoter's faced a higher cost of getting their project approved. Also if in the broader region there were more MPs from the ruling party then vested interests were emboldened to fight river improvement projects and thereby raise the cost of getting legislative approval. Party politics seem to have been less of a factor in the case of turnpike roads, perhaps because they were less threatening to vested interests.

The general finding is that party politics slowed some infrastructure projects in the post-Glorious Revolution period and accelerated others, imparting a political bias. Our results are thus consistent with the findings of Stasavage (2005) that party conflict affected government credit worthiness in the early 1700s. However, one should not over-state the long-run effects of party in this case. By the 1720s Britain's transportation network had expanded significantly relative to 1689. It would continue to do so over the eighteenth century in a manner broadly consistent with the demands of industrialization (Bogart and Richardson 2011).

Our results can also be interpreted using North, Wallis, and Weingast's (2009) model of a limited access order. They argue that most rulers restrict market access to members of the ruling clique in exchange for political support. The exceptional cases are open access orders where free entry is allowed. In this paper, we provide some evidence that Britain was closer to the limited access order during the period between 1690 and 1715. It must have taken a more significant step towards open access at a later period in its history.

II.   Background

The Glorious Revolution of 1688 marked a significant turning point in the political history of Britain. Over the next two decades the House of Commons and Lords solidified a key role for Parliament in governing the country. During the seventeenth century, the Crown tried to expand its powers and rule independent of Parliament. It ultimately failed when James II was forced to abdicate his throne following the invasion of William of Orange. The new king and queen, William and Mary, were forced to negotiate with the House of Commons on a number of key issues like taxation, foreign policy, and religious toleration. In 1701 the leadership in the House of Commons imposed a succession agreement guaranteeing a protestant monarch once the last of the Stuart line, Queen Anne, died.   Their plan was implemented in 1714 when George of Hanover was made king.

The transition to representative government was not harmonious and exposed divisions within British society. The most poignant example is the conflict between the Whigs and Tories. Political parties emerged in the 1670s and 80s during the exclusion crisis. The Whigs favored excluding the brother of King Charles II, James Duke of York, from the taking the throne largely on the basis of his Catholicism. The Tories felt that exclusion represented too great an incursion into the authority of crown. Although most Tories and Whigs supported the changed of monarchy under Glorious Revolution they subsequently diverged on key issues. The Tories represented a significant portion of the landowning interest and favored the privileges for the Church of England and lower taxes. The Whigs represented a combination of landowners and

financial or mercantile interests. The Whigs generally favored religious toleration for dissenters and an aggressive foreign policy specifically an expanded army (Harris 19xx).

Crucially the Whigs and Tories sought to implement their favored policies by controlling the House of Commons. The two parties were engaged in fervent struggle for seats in the Commons. The most vigorous period of party competition was from 1690 to 1714, also known as the 'Rage of Party.' There were ten elections from 1690 to 1714 and the majority party in the Commons changed at least five times (see table 1). Changes in the ruling party led to frequent changes in party leadership. The Whig 'Junto' were the dominant faction in the late 1690s. A mixed ministry of Whigs and Tories followed in early 1700s. Robert Harley led the Tories in the early 1710s.

Table 1: Legislative Sessions and the Majority Party

Session	Majority Party
1690-1695	Tory*
1695-1698	Whig
1698-1700	Whig
1700	Tory
1701	Whig
1702-1705	Tory
1705-1708	Tory
1708-1710	Whig
1710-1713	Tory
1713-1715	Tory

Sources: Cruickshanks, Handley, and Hayton (2002)

Notes: *There is doubt that parties were well defined in the 1690-1695 session.

It is commonly thought that policies and the distribution of political spoils changed with shifts in parties. For example, David Stasavage (2005) argues that government bondholders faced greater risks when the Tories were in power as they had greater incentive to default. He offers

evidence that bond yields were higher in years of Tory control in the Commons. By comparison with government debt and financial policies little is known about how parties were linked with another major development after 1689: the rise of private acts. There was an explosion in legislation after the Glorious Revolution. The annual number of acts of Parliament grew from less than 10 per year in the 1660s to more than 50 in the early 1700s and more than 100 by the early 1800s (Hoppit 1997). Bogart and Richardson (2011) give a detailed description of how legislation altered property rights particularly through estate acts, statutory authority acts, and enclosure acts. A good portion of statutory acts dealt with the improvement of roads, bridges, river navigation, ports, canals, and railways. Statutory authority acts were necessary because existing governmental entities—parishes, counties, boroughs, and sewer commissions—lacked appropriate fiscal devices and clear powers of eminent domain.

River navigation provides an illustration. In the early seventeenth century, most tidal rivers were under the authority of Commissions of Sewers. Commissions could compel landowners to cleanse waterways and could tax land along riverbanks to pay for upkeep, but not tax individuals who traveled on the river or drank its waters and could not purchase land along a waterway or divert its course. These limitations kept sewer commissions from improving and extending navigable waterways.

To encourage the improvement and expansion of infrastructure, Parliament passed statutory authority acts that established organizations whose trustees served without remuneration and served in the public interest or they established for-profit corporations such as joint-stock companies, whose directors purchased shares and profited from their investments (Webb and Webb 1963). To these new organizations, statutory authority acts granted an array or rights. One was the right to levy user-fees and/or raise revenue through other means. A turnpike act, for

example, authorized a trust operating a turnpike to levy tolls on road-users and claim labor (or the equivalent in taxes) from inhabitants along the road. The tolls marked a significant departure from the existing system, in which parishes paid for road improvements with local labor and property taxes, and in which individuals possessed the right of free passage.[1]

By most accounts the trustees and investors had multiple aims in running statutory authorities. One aim was to make money through the tolls, especially in the case of joint stock companies. The other was to reduce transport costs by building roads and improving navigation. As many trustees and investors were local landowners, merchants, and industrialists they stood to benefit through increased property values and profits. Most of these goals were ultimately realized. Statutory authorities led to major improvements in infrastructure and lower transport costs (Bogart 2005a,b). They also balanced financial gains for investors with sizeable indirect benefits to nearby property owners (Bogart 2009).

Statutory authority acts were quite controversial from their inception in the early 1690s. There are a number of reasons. First, there was the issue of introducing tolls to finance infrastructure. Users expressed concern that tolls revenues would be appropriated and would not be applied to infrastructure maintenance and investment. There fears were well founded as users would only benefit if the value of services derived from better infrastructure exceeded the tolls. Second, there was a concern about trade diversion effects. Some towns benefitted from their position as a trade *entrepos.* Altering the transportation network could undermine their locational advantage. They often opposed projects outright. Third, there was a concern that local property owners would suffer damages. River navigation projects were particularly controversial as they

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[1] Statutory authority acts limited the powers of trustees. Turnpike acts, for example, defined maximum tolls. In each act, a schedule distinguished different types of traffic and goods, and for each group, a maximum permissible toll. Similar schedules regulated the issuance of debt and terms of interest.

increased the chances of flooding. They also threatened to make mills and weirs obsolete as they

depended on the maintenance of existing water flows. Statutory authority acts included

provisions to address these problems. If the parties could not agree on the price of land or

damages anyone could appeal to a body of commissioners who along with a jury would make a

recommendation. Despite such assurances, there was great distrust of commissions in the 1690s

and early 1700s. Substantial opposition remained.

   In part because of opposition, bills for road and river improvement were not guaranteed to

succeed and become acts of Parliament. As shown in table 2 most bills for local road and river

improvement failed in the 1690s.[2] Only by the 1710s did the success rate become reasonably

high. Success rates are important because they provide an indicator of the costs of promoting

bills. At a minimum failure represented a loss of time as one had to wait at least until the next

session to introduce a bill. Failure also implied financial losses as one had to pay fees to

parliamentary agents. Some of these fees were undoubtedly sunk and could not be recovered if

the bill failed.

Table 2: Road and River Improvement Bills initiated in the Commons, 1690-1719

	roads			rivers		
	1	2	3	4	5	6
period	Bills	% that became Acts	% that were formally Opposed	Bills	% that became Acts	% that were formally Opposed
1690-1699	8	40%	13%	25	30%	48%
1700-1709	16	56%	25%	12	25%	42%
1710-1719	25	84%	16%	16	55%	50%

source: see text below.

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[2] These figures are consistent with what Hoppit (1997) has shown for all legislation from 1690 to 1719.

The literature to date had not established how parliamentary politics affected the success rate for individual bills or their geographic location. In one of the first major studies on failed legislation, Hoppit (1996) argued that procedural changes, like the introduction of standing orders, were important in raising the success rate. Hoppit's analysis examines the trends over time for general categories of legislation, but does not consider what characteristics might make an individual bill fail or succeed. Specifically we don't know if it mattered whether MPs on the committee handling the bill were from the ruling party in the House of Commons. We also don't know whether geographic areas that were better represented by the ruling party had a higher likelihood of success and therefore lower cost of promotion.

Drawing on the political science literature, one might expect that political parties would act as minimum winning coalitions that restrict bills to constituencies represented by their party. It would matter therefore whether an MP working on a committee was from the ruling party and whether a region affected by the bill was well represented by the ruling party. North, Wallis, and Weingast's model of a limited access order is also relevant. They hypothesize that most rulers restrict access to markets and organizations in order to build a coalition supporting their regime. By extension the ruler would also design policies to protect the existing rents of elites that supported their regime. In our setting there was significant opposition to bills as projects threatened the livelihood of some cities and local landowners. Given the fragility of the regime and the partisan nature of politics we might expect that it would be more difficult for a promoter to get a bill if there was opposition from well-connected groups.

As the connection between party and improvement bills has never been studying in the British context, we start by developing a theoretical framework to illustrate how political parties

could influence the passage of improvement bills and their promotion. Our analysis yields testable predictions analyzed in later sections.

III.   Theoretical Framework

There are four key actors theoretical framework: promoters, opposition groups, committees, and party leaders in the House of Commons. We model decisions over a series of stages. In the first stage the promoter decides whether to introduce a bill. In the second stage opposition decides whether to fight the bill. In the third stage, promoters and opposition groups find MPs to represent them on the bill. In the fourth stage the House of Commons decides whether to approve bills.

Several assumptions are made in the model. First, each project is assumed to yield private benefits to the promoter and private losses to the opposition. Second, the promoter and opposition must pay a fixed cost to introduce the bill or fight the bill. The fixed cost is sunk and cannot be recovered if the bill fails. Third, promoters and the opposition must search for MPs to represent them on the committee. The cost of finding MPs decreases in the distance from the promoter or the opposition. The idea is that promoters and opposition could more easily communicate with MPs and identify a good match if there were more MPs in their area. Fourth, the outcome of a bill is never certain, but having more ruling party MPs representing the promoter increases the probability the bill succeeds and having more MPs representing the opposition decreases the probability. The idea is that promoters and opposition groups must persuade party leaders to approve or reject the bill. Party leaders in the House are more inclined to approve bills if more of their party members on the committee favor it. Fifth, party leaders also consider the private benefits to the promoter and private losses to the opposition. If the

benefits are less than the losses then party leaders will place less weight on the numbers of MPs representing the promoter on the committee and more weight on the numbers of MPs representing the opposition.

At the end of this section we discuss the implications of changing these assumptions, but for now it is useful to analyze their implications. Table 3 summarizes the stages of the game and the actions.

table 3: stages of the game
stage 1: Promoter decides whether to introduce bill. If yes, they pay a fixed cost.
stage 2: Opposition decides whether to fight a bill. If yes, they pay a fixed cost.
stage 3: Promoter and opposition choose number of ruling party MPs to represent them on committee. They incur costs depending on number of ruling party MPs in their area.
stage 4: Party leaders approve bills. Chances of success depend on number of ruling party MPs representing the promoter and opposition.

We solve the game using backward induction. There are several outcomes by stage 4 when party leaders consider the bill. If the promoter does not introduce the bill then stage 4 is irrelevant. If the promoter has introduced the bill but the opposition has decided not to fight then the bill succeeds with probability one. The most interesting case is when the promoter and opposition have entered. By the time party leaders are examining the bill, the promoter and opposition have chosen the ruling party MPs representing them on the committee. Let mp_p be the number of MPs on the committee representing the promoter and mp_o be the number of MPs representing the opposition. Party leaders also consider the private gains and losses to the

promoter and opposition. Let b be the net present value of the project to the promoter if it is approved and let l be the net present value of the damages suffered by the promoter if it is approved.

We combine all these terms in a contest success function $p = p(mp_p, mp_o, b, l)$ representing the probability the promoter win's and the bill is approved (see Skaperdas and Vaidya 2009). Our assumption is that p is increasing in mp_p and b and decreasing in mp_o and l. To illustrate ideas, it is useful to analyze the 'Tullock' contest success function where the probability of a successful bill is $p = \frac{bmp_p}{bmp_p + lmp_o}$. In this case, the probability the promoter wins the contest is increasing in mp_p and the probability the opposition wins is increasing in mp_o. The other important feature is that the marginal effect of mp_p increases in the private benefits b. Likewise, the marginal effect of mp_o increases in the private losses l.

In the third stage, the promoter and opposition decide how many MPs to represent them on the committee. The objective function for the promoter is $p(mp_p, mp_o, b, l)b - c(d_p)mp_p$. The first term is the probability the promoter wins the legislative contest times the value of their private value of winning. The second term is the cost of matching with ruling party MPs where $c(d_p)$ is the promoter's marginal cost of getting an additional ruling party MP on the committee. The marginal cost c is a function of d_p representing the density of ruling party MPs in the geographic location of the promoter. The key assumption is that greater ruling party density lowers the marginal cost of getting MPs on the committee ($\frac{\partial c}{\partial d_p} < 0$).

The objective function for the opposition is $-p(mp_p, mp_o, b, l) \, l - c(d_o)mp_o$. The first term is the probability the opposition loses the contest multiplied by their loss. The opposition wins

the contest with probability $1 - p(mp_p, mp_o, b, l)$ in which case they have a payoff normalized to 0. The opposition pays a marginal cost $c(d_o)$ to get an additional MP on the committee. Like the promoter the marginal cost declines in density of the ruling party d_o near the opposition.

The equilibrium number of MPs representing promoters and opposition groups mp_p^* and mp_o^* can be derived by taking first order conditions and solving for the two equations. In the case of the Tullock success function, the equilibrium number of MPs can be solved analytically:

$$mp_p^* = \frac{bl^2}{c(d_o)[b + \frac{c(d_p)}{c(d_o)}\frac{l^2}{b}]^2}$$

$$mp_o^* = \frac{c(d_p)}{c(d_o)}\frac{l}{b} mp_p^* = \frac{c(d_p)l^3}{c(d_o)^2[b + \frac{c(d_p)}{c(d_o)}\frac{l^2}{b}]^2}$$

The equilibrium success probability p^* is defined by substitution of these values.

In the second stage, the opposition must decide whether to fight the bill. Obviously if the promoter has not introduced the bill then they face no choice. If the promoter has introduced the bill, the payoff to the opposition from fighting is a function of the number of MPs they and the promoter will choose in stage 3. Let $p^*(mp_p^*, mp_o^*, b, l)$ be the expected probability as a function of the equilibrium choices of MPs in stage 3. The expected payoff for the opposition is $-p^*(mp_p^*, mp_o^*, b, l)\, l - c(d_o)mp_o^*$. If the opposition fights the bill then they must incur a fixed cost f. Thus if the opposition fights the bill they expect to earn $-p^*(mp_p^*, mp_o^*, b, l)l - c(d_o)mp_o^* - f$. If the opposition does not fight the bill they will earn the loss $-l$ for certain. Thus the opposition will fight the bill if the following inequality holds:

$$-p^*\big(mp_p^*, mp_o^*, b, l\big)l - c(d_o)mp_o^* - f > -l.$$

In the first stage, the promoter decides whether to introduce the bill. We assume they can perfectly anticipate whether there will be opposition. If there is no opposition then the probability of success is one. In this case, the promoter will only consider the fixed costs of introducing a bill Let f be the fixed cost to the promoter (assumed to be the same as the opposition). The promoter will introduce the bill if $b > f$. The more interesting case is when the promoter anticipates opposition. Here their expected payoff is $p^*\big(mp_p^*, mp_o^*, b, l\big)b - c(d_p)mp_p^*$ where mp_p^* and mp_o^* are the equilibrium MPs chosen by each side. Thus the promoter will introduce their bill if the following inequality holds

$$p^*\big(mp_p^*, mp_o^*, b, l\big)b - c(d_p)mp_p^* - f > 0.$$

The model generates a number of comparative statics results. The most important from our perspective is the relationship between the payoff to the promoter and the density of the ruling party in their area d_p. If ruling party density decreases then the promoter's marginal cost of matching with ruling party MPs increases. One can easily show that the equilibrium choice of MPs representing the ruling party mp_p^* declines. The equilibrium success probability p^* also decreases with lower d_p. The reason is that MPs representing the ruling party mp_p^* declines more rapidly than changes in MPs representing the opposition mp_o^*. Thus the expected value of winning the contest $p^*\big(mp_p^*, mp_o^*, b, l\big)b$ goes down. Putting these elements together the expected payoff to the promoter from introducing their bill decreases with d_p. The opposite result holds for the opposition. Its expected payoff increases with lower d_p.

A model simulation provides an illustration. Figure 1 plots the payoffs to the promoter

and the opposition (gross of the fixed cost) as a function of as a function of $c(d_p)$ where

$(b, l, c(d_o)) = (5,5,1)$. Payoffs to the promoter decrease when the promoter's cost of matching

with ruling party MPs rises. If the fixed cost is two then there is a threshold marginal cost around

0.6 at which the gross expected payoff is no longer large enough to justify the expenses of

promoting the bill.

Expected Payoffs to the Promoter and Opposition Gross of the Fixed Costs

Promoter's Marginal Cost of Matching with MPs

— gross payoff promoter — gross payoff to opposition
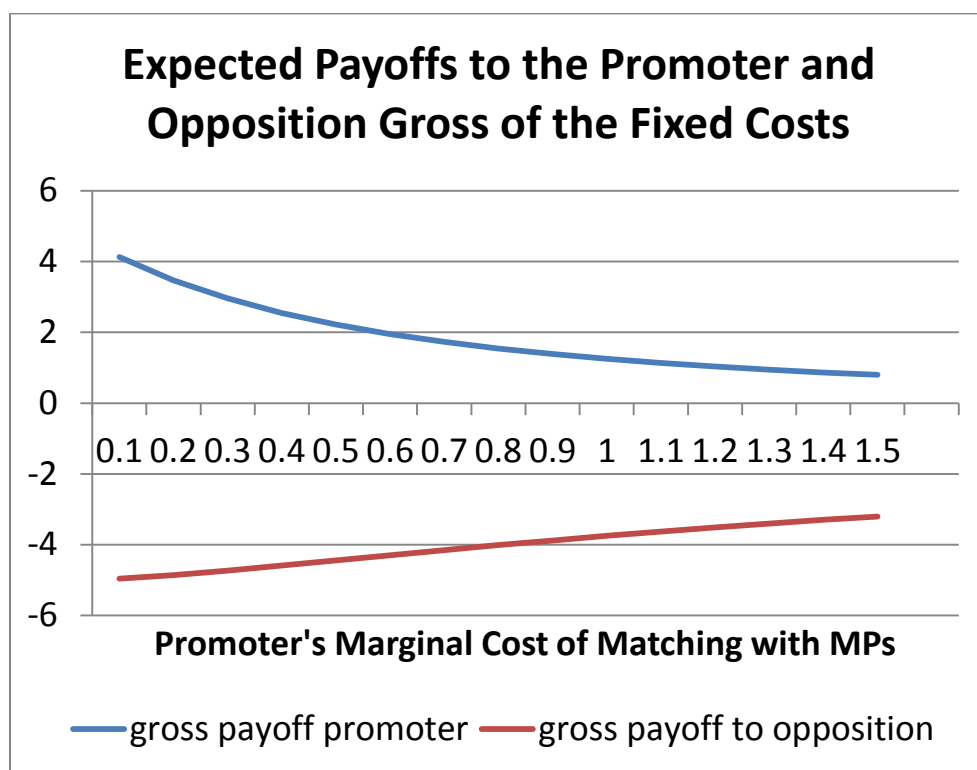
We also derive comparative statics with respect to the private benefits b. Not surprisingly if b

rises then there is a greater likelihood the promoter's gross payoffs will exceed the fixed cost and

they will introduce the bill. There is also a co-relationship between the private benefits, ruling

party density, and expected payoffs. Let the threshold private benefit for fixed cost f be defined

by $b^*(f)$. Below this value the expected profits are too small to justify promoting the bill. As

ruling party density increases, then the threshold private benefits $b^*(f)$ descreases. Similarly as ruling party density decreases then the threshold private benefits increases.

We illustrate the relationship between ruling party density and private benefits graphically. Figure 2 shows the gross expected payoff to promoters as a function of the promoter's marginal cost of matching with MPs at different values of private benefits b ranging between 5 and 8 when $(l, c(d_o)) = (5,1)$. Consider the case where the fixed cost is four and the marginal cost is 0.3. Here only projects with a private value above six will be introduced. Now if the marginal cost rises to 0.6 because ruling party density is lower, then only projects with a private value above seven will be introduced. One implication is that projects with lower ruling party density will tend to have higher private benefits all else equal. As a result, among the projects that get introduced the observed success rate is not necessarily decreasing when ruling party density decreases.
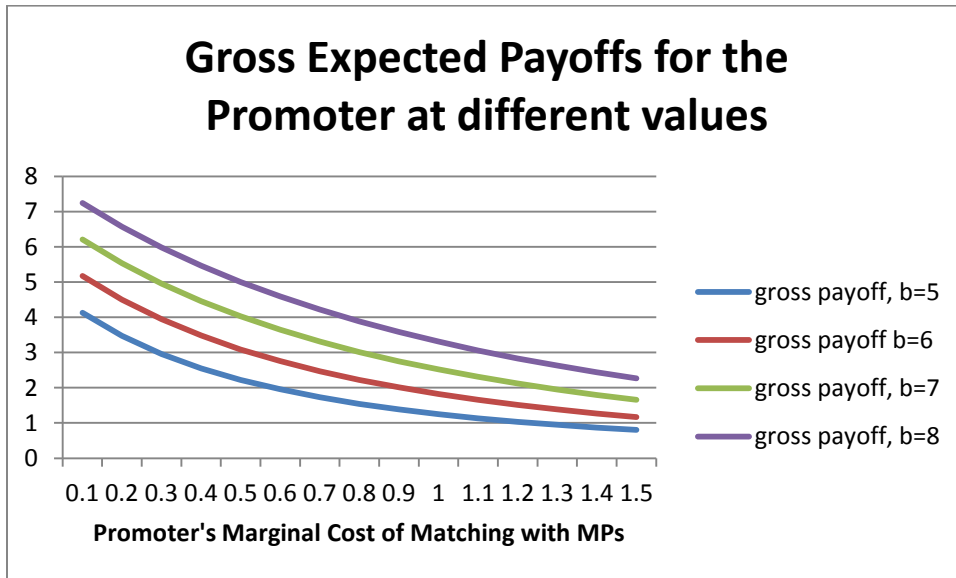
We close by summarizing the testable predictions from the theoretical framework. First, our model suggests that having ruling party MPs on the committee helps both promoters and

opposition groups. We did not explicitly model the choice of matching with non-ruling party MPs versus ruling party MPs. Our implicit assumption is that ruling party MPs are preferred all else equal. Therefore the prediction is that MPs from the ruling party should be over-represented on the committee. The alternative hypothesis is that MPs are randomly selected (perhaps conditional on other characteristics), in which case the probability that an MP on the committee is from the ruling party should equal the fraction of all MPs from the ruling party in Parliament.

Second we argued that a promoter is more likely to introduce a bill and get it passed if there is a greater density of ruling party MPs in their area because it lowers their cost of matching with ruling party MPs on the committee. Assuming that promoters reside in the constituency affected by the act we get the prediction that an improvement act is more likely in a constituency if it is represented by more ruling party MPs. Our model also predicts that a constituencies' bill is more likely to pass if it has more ruling party MPs, but with one caveat. If party representation is negatively associated with private benefits as our model suggests then the measured effect of party density on success of bills may be attenuated.

Notice that we assume a particular formulation of party bias in that party leaders like to approve bills favored by MPs from their party. Our premise is that MPs collected bribes (or some other benefit) in exchange for helping promoters. Party leaders can then ensure the loyalty of their fellow MPs by favoring their opinions on the committee and helping them to collect bribes from promoters. A different assumption is that partly leaders like to approve bills if there are more ruling party MPs in the area of the promoter. Here the idea is that local MPs get votes if they assist promoters and party leaders want their MPs to win elections. The key thing to note is that we still predict a geographic association between ruling party density and acts under this alternative assumption.

There are other scenarios which we have not explicitly considered. One could assume the number of ruling party MPs on the committee is irrelevant to a bill's chances of success. In other words, party representation does not matter. Or one could assume that the cost of matching with ruling party MPs does not depend on the geography of party representation. These two scenarios suggest that constituencies with more ruling party MPs are no more likely to have bills introduced or get acts. There is another reason why we may find no relationship between ruling party strength near promoters and their likelihood of introducing a bill. Our model show that if opposition groups and promoters are in the same location and thus have the same density of ruling party strength $d_p = d_o$, then their choices of ruling party MPs may be invariant to changes in ruling party density. Recall that in the case of the Tullock success function the equilibrium choice of MPs for the opposition is $mp_o^* = \frac{c(d_p)}{c(d_o)} \frac{l}{b} mp_p^*$. Notice that if $d_p = d_o$ then raising d does not affect the ratio $\frac{c(d_p)}{c(d_o)}$ and so the choice of MPs for each side remains the same. As a result, the probability of the promoter's bill succeeding does not change. We emphasize this case because there is reasonable likelihood that promoters and opposition groups lived near one another and thus faced the same ruling party density. In the empirical analysis we address this issue using precise information on the location of opposition groups. Our prediction is that constituencies with bills introduced in their area are more likely to have someone in their jurisdiction formally oppose a bill in Parliament if they have more ruling party MPs.

IV.   Data

The Parliamentary Archives maintains a website, *Portcullis*, which contains the title of every act of Parliament starting in 1500.[3] The *Portcullis* database is used to identify all acts that dealt with individual roads and rivers between 1689 and 1715 (see Bogart and Richardson 2011). Acts started as petitions submitted by individuals and local governments. Once a petition was submitted we treat it as a bill that could become an act (see Hoppit 1996 for a similar approach to all legislation). The indices of the *Journals of the House of Commons* and the *Journals of the House of Lords* are used to identify all bills introduced in the Commons and Lords dealing with specific roads and rivers between 1600 and 1749. From the *Journals* we entered the details of every road or river bill into a spreadsheet, including petitions, orders, committee reports, votes, and amendments. The petitions are particularly useful because they identify the aims of the bill. Some attempted to obtain rights to improve the navigation of a river or to better maintain and improve a road. Others proposed to amend the rights of an existing authority. Based on their description, we separate all bills that proposed to improve a road or river from bills that amended existing rights.[4] Our analysis concerns the fate of 'new' projects proposing to improve roads and rivers as we are interested with entry into markets.

After a petition was introduced, it was immediately assigned to a small number of MPs who reviewed the petition and wrote a bill. The bill was then presented to the House of Commons. If the bill proceeded further it was reviewed by a larger committee, usually consisting of 50 MPs. One MP from the committee issued a report to the House. Bills that were eventually approved by the House were then carried to the Lords by an MP from the committee. The *Journals of the House of Commons* identifies the names of MPs who performed these actions. Thus we know

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[3] See http://www.portcullis.parliament.uk/DserveA/ for more details.
[4] For rivers I identify whether the bill was for an improvement using the petitions and committee reports. For roads I only included bills that proposed a new turnpike trust.

which MPs presented bills, belonged to committees, issued reports, and carried passed bills to the Lords. Our analysis focuses on committee 'leaders,' or those who were initially assigned a bill, reported from a committee, or carried the bill to the Lords. Committee leaders clearly worked on the bill, while the 50 or so MPs on the committee may have played a minor role.

This paper also uses a new data set on the political affiliation of MPs. There is no existing machine-readable database describing the political affiliation of all MPs in Parliament. Cruickshanks, Handley, and Hayton (2002) in the well-known volume, *The House of Commons: 1690-1714,* give total counts of Whig MPs, Tory MPs, and unknown MPs for each legislative session from 1690 to 1715, but they do not provide a spreadsheet with a classification for each MP. Instead they provide a biography of every MP with descriptions of their politics, education, profession, and other characteristics. Although the biographies are extremely valuable they are difficult to use as source for assigning political affiliation to all MPs. A researcher must read every biography and infer party affiliation from the description.

Fortunately a short-cut is available. The archivists at the History of Parliament trust have retained a ledger which Cruickshanks, Handley, and Hayton used to construct party affiliation.[5] The ledger contains the voting records of all MPs on major pieces of legislation or so-called 'division' lists. For example, there was a bill in 1696 to create a 'council of trade' strengthening enforcement of the Navigation Acts. There was a forecast of the vote which identified all MPs likely to support the court, likely to oppose the court, or were doubtful. The forecast is part of the records of the British Library and has been transcribed into the ledger by Cruickshanks, Handley, and Hayton.

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[5] We thank Stuart Handley for kindly bringing to our attention the existence of the ledger.

We use division lists to identify the party affiliation of MPs much like previous scholars. We first identify how voting on the division was linked to the goals of party leaders in the House of Commons. For example, in the 1696 bill to create a council of trade, the classification 'support the court' implied the MP was voting with the Whig party who were in power following the 1696 election. The classification 'oppose the court' could imply the MP was a tory, but it might also include independent MPs. The same conclusions can be drawn from 'doubtful.' Given the ambiguities we focus on whether MPs voted with the ruling party on each division, not whether they opposed or were doubtful.

Often there are several division lists in each legislative session. The appendix provides a list of all the division lists studied in each legislative session. As one can see from Cruickshanks, Handley, and Hayton (2002) we use the major division lists discussed in the literature. When we have more than one division list in each session we adopted a strict standard for coding MPs. The MP had to vote with the ruling party in all division lists or be absent in order to be classified as a ruling party MP. In other words, one vote against the ruling party disqualified an MP from being coded as a ruling party MP in that session. In the appendix we describe how political affiliation is determined in each legislative session using the division lists. We also describe how we deal with MPs that never or infrequently voted.

Our data cover 10 legislative sessions from 1690 to 1715. Table 4 gives a summary of our party measures. Column one gives the year each legislative session began. Column two shows Cruickshanks, Handley, and Hayton's (2002) classification of the party with the most MPs in Parliament. We refer to them as the 'ruling' party. Column 3 shows our count of the number of ruling party MPs in the House. The last column gives the percentage of ruling party MPs in the total for the House of Commons. Notice that in some sessions, like 1690 and November 1701,

the largest party does not have a majority. Keep in mind some MPs were not affiliated with any party and that we adopted a strict standard for measuring party.

Table 4: Party Data

Session	Ruling Party	Number of MPs in Ruling Party	Percentage of MPs in the House with Ruling Party
1690	Tory	224	43.70%
1695	Whig	251	48.90%
1698	Whig	256	49.90%
1701 Jan.	Tory	258	49.00%
1701 Nov.	Whig	218	42.30%
1702	Tory	288	52.00%
1705	Tory	262	46.70%
1708	Whig	308	56.10%
1710	Tory	595	55.10%
1713	Tory	538	59.50%

sources: see text.

Our party affiliation data allows us to construct two key variables. The first is the fraction of MPs working on the committees who were with the ruling party in the session the bill was introduced. We focus on the fraction of leading MPs on the committees which usually number 1, 2, or 3. The second variable of interest is the fraction of MPs with the ruling party in each constituency (counties or boroughs). In some cases, there are only two MPs for a constituency so the possible values for the fraction with the ruling party are 0, 0.5, and 1. If an MP left the House within a session for some reason we have more than two MPs, in which case the fraction with the ruling party ranges between 0 and 1. To illustrate the data we created thresholds, where a constituency is considering to be well represented by the ruling party if the fraction of MPs in the ruling party is above 0.8. A constituency is not well represented by the ruling party if the fraction of MPs in the ruling party is below 0.2. The consistency has mixed representation if the fraction

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of MPs in the ruling party is in-between 0.2 and 0.8. Maps 1 through 8 show the geography of representation in each of the 10 sessions using the threshold variables. Darker areas are intended to represent constituencies where the ruling party was strongly represented. Clear or lighter areas represent constituencies where the ruling party was not strongly represented. Grey areas are mixed.

Later it will be necessary to measure the density of ruling party representation at the regional level. In our data we have latitude and longitude for every city in England and Wales. Thus we can associate ruling party strength with geographic coordinates. For municipal corporations it is straightforward to give coordinates for its fraction of ruling party MPs as they are cities. For counties we use the largest city or the traditional county-seat as the geographic coordinate. Often the largest city and the traditional county-seat are the same, but there are some exceptions. Once we have assigned the fraction of ruling party MPs in each constituency to a geographic coordinate, the density of party representation can be calculated at any scale. We focus on the fraction of ruling party MPs among all MPs within a 25 mile radius.

The main goal of the empirical analysis is to investigate the geographic relationship between party affiliation and the incidence of road and river bills and acts. As the data on petitions specifies the locations of projects we are able to match bills with constituencies. Most petitions are very specific stating the city and county. For example, a bill from 1695 states it is for the improvement of the 'River Avon, from Cities of Bath and Bristol.' Another bill in 1711 is for 'the improvement of roads near Highgate Gatehouse and Barnet Blockhouse in Middlesex County.' In the first case, Bath and Bristol are municipal corporations with their own MPs in Parliament. We assign this bill to the Bath and Bristol constituencies. In the second case Highgate and Barnet are not municipal boroughs, so we assigned the bill to Middlesex County.

V.   Results

v.1 Party and Affiliation and Committees

We theorize that leading MPs on the committees were not chosen randomly and were, in fact,

searched for by promoters who wanted to get their bill passed. If this is the case, we should see

evidence in the data that MPs from the ruling party are over-represented as leaders on the

committees compared to the fraction of all MPs from the ruling party in the House of Commons.

We test this hypothesis for road bills and river bills separately. The road bills dataset includes 51

bills introduced between 1690 and 1715. Out of the 51 bills, there is one bill that did not list any

MP on the committee. The number of MPs listed range from at least one to a maximum of six,

for a total of 136. For each MP, we recorded whether or not they are part of the ruling party in

the variable *fracmaj* (1=Yes, 0=No). Out of the 136 MPs listed, we were able to determine if the

MP was with the ruling party for 129 of them.[6] The river bills dataset includes 52 bills

introduced between 1690 and 1715. Besides five river bills that did not list a leading MP, each

river bill includes one to six leading MPs, totaling 110. Out of the 110 MPs listed, we were able

to code the *fracmaj* variable for 109 MPs.

     We begin with a T-test on the entire period 1690 to 1714. The null hypothesis is that the

mean value of *fracmaj* is equal to the mean value of the fraction of all MPs from the ruling party

in the House of Commons, which, for the period of 1690 to 1714, equals 50.44%. The alternate

hypothesis is that the mean value of *fracmaj* is greater than 50.44%. Starting with road bills we

can reject the null hypothesis that the mean *fracmaj* for road bill committees equals the mean

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[6] In the Journals of the House of Commons, MPs on the committee are described with last names only. If the named
MP had a unique last name in the same legislative session we obtained a match. If there were multiple last names
and the MP was from the same area of the bill we considered it a match. If there were multiple MPs with last names
from the area we dropped the MP as they could not be identified.

fracmaj for the entire House of Commons (see the top panel of table 5). We also conduct a T-test

for the period 1690 to 1708 and 1710 to 1714 separately. For the 1690-1708 period the mean

fracmaj on road bill committees is higher than the fraction of MPs that are with the ruling party

in the House but the difference is not significant. For the 1710-1714 the average size of

majorities in the House of Commons is larger than from 1690 to 1708 consistent with the views

of historians that partisanship was greater in the early 1710s. We find that the selection of ruling

party MPs on road bill committees is also much larger in the early 1710s. As table 5 shows the

mean for *fracmaj* is 0.76 and is significantly different from the mean for the Commons.

Table 5: Are Ruling Party MPs over-represented on Committees?

road bills

time period	mean fracmaj bill committee	std. err.	mean fracmaj all Commons	p-value H0: means same	n
1690-1715	0.641	0.042	0.504	0.001	128
1690-1708	0.548	0.059	0.486	0.3	73
1710-1714	0.763	0.057	0.571	0.001	55

river bills

time period	mean fracmaj bill committee	std. err.	mean fracmaj all Commons	p-value H0: means same	n
1690-1715	0.587	0.047	0.504	0.083	109
1690-1708	0.536	0.055	0.486	0.37	82
1710-1714	0.74	0.085	0.571	0.06	27

We perform the same set of tests for river bills (see the bottom panel of table 5). For the

1690 to 1715 period we can reject the null hypothesis of equal means at the 5% significance

level. As with road bills MPs from the ruling party are over-represented on river bill committees.

Again party representation matters more for the 1710 to 1714 period compared to the 1690 to

1708 period. The mean for *fracmaj* on river bill committees is 0.74 in the later period compared

to only 0.536 in the earlier period. Only the mean for the 1710 to 1714 period is statistically

larger than the average fraction of ruling part MPs in the Commons.

Next, we conducted a simple correlation analysis to try to see if there was some other

characteristic, like occupation or experience, that is related to ruling party MPs being on the

committee. We run the correlation analysis of *fracmaj* on *placeman* (1=if the MP was listed as

placeman in that session), *army/navy* (1=if the MP served in the army or navy), *lawyer* (1=if the

MP was a lawyer), *businessman* (1=if the MP was a businessman), and *yearsmp* (the number of

years the MP has sat in the House). Table 6 shows the results for road bills.

Table 6

	fracmaj	placeman	army/navy	lawyer	businessman	yearsmp
fracmaj	1.0000					
p-value						
placeman	0.0889	1.0000				
p-value	0.3223					
army/navy	-0.1352	0.0310	1.0000			
p-value	0.1313	0.7234				
lawyer	0.1067	0.2294*	-0.1996*	1.0000		
p-value	0.2344	0.0079	0.0213			
businessman	0.1297	0.2011*	-0.0540	0.2773*	1.0000	
p-value	0.1479	0.0203	0.5373	0.0012		
yearsmp	-0.2000*	0.0173	-0.0802	-0.1317	0.1376	1.0000
p-value	0.0247	0.8437	0.3585	0.1309	0.1141	

The variable *fracmaj* is not significantly correlated with any of the other variables except for

yearsmp, which has a negative correlation. This result shows that the more years an MP on the

committee served in the House of Commons, the less likely they are to be with the ruling party.

This last result is not surprising if our theory is correct. We argue MPs on the committee are

more effective in passing bills if they are from the ruling party. If there was some other

characteristic that increased effectiveness then we would expect that to be negatively associated with party because if an MP is not from the ruling party they would likely require this characteristic to be valuable on the committee. Experience is perhaps the most important characteristic that is likely to increase effectiveness on committees. Experience helps MPs navigate bills through the legislative process. Thus it is not surprising to have a negative correlation between ruling party status and years of experience.

We conducted two different correlation analyses for the river bill dataset. The first one, as show in Table 7 includes the same variables used in the road bill dataset. Here *fracmaj* is not correlated with any of the variables including *yearsmp*.

Table 7

	fracmaj	placeman	army/navy	lawyer	businessman	yearsmp
fracmaj	1.0000					
p-value						
placeman	0.0948	1.0000				
p-value	0.3269					
army/navy	0.1361	0.3252*	1.0000			
p-value	0.1583	0.0006				
lawyer	0.1220	-0.0975	-0.1637	1.0000		
p-value	0.2063	0.3131	0.0890			
businessman	0.0253	-0.0490	0.0656	0.1372	1.0000	
p-value	0.7940	0.6126	0.4982	0.1550		
yearsmp	-0.0788	0.1148	-0.0722	-0.0849	-0.0041	1.0000
p-value	0.4153	0.2346	0.4556	0.3802	0.9664	

In a second correlation analysis we analyze a different set of MP-specific variables that we were able to record in this dataset. These variables are: *payments* (1=if the MP was getting annual payments or pensions from the positions they held), *landwealth* (1=if the MP primarily got their wealth from the lands or estates they held), *nonlandwealth* (1=if the MP primarily got

their wealth from businesses or professions they had), *debt_problems* (1=if the MP had debt or financial problems), *marriagewealth* (1=if the MP received significant settlement payments from marriage), *marriagepolitical* (1=if the MP's spouse is related to another MP), *relativemp* (1=if the MP had a relative who was also an MP), *mayor* (1=if the MP was a mayor), *profession* (1=if the MP had a profession, i.e., lawyer, merchant, or military), *age* (the MP's age at the time of the bill), *noble* (1=if the MP had a title of nobility), and *education* (1=if the MP earned a university education). Table 8 shows the complete correlation matrix. Once again *fracmaj* is not significantly correlated with any of the MP-focused variables. Thus, it is highly likely that leading MPs in the river bills were chosen for their political affiliation in relation to the ruling party and not because of other characteristics

Table 8.

	fracmaj	payments	landwealth	nonlandwealth	debt_problems	marriagewealth	marriagepolitical	relativemp	mayor	profession	age	noble	education
fracmaj	1.0000												
p-value													
payments	0.2038	1.0000											
p-value	0.1602												
landwealth	0.1753	0.4196*	1.0000										
p-value	0.2282	0.0027											
nonlandwealth	-0.0400	0.1228	-0.3599*	1.0000									
p-value	0.7848	0.4004	0.0111										
debt_problems	-0.1179	0.1017	0.1803	-0.2453	1.0000								
p-value	0.4200	0.4868	0.2150	0.0893									
marriagewealth	0.0913	0.2495	0.1571	-0.2777	0.1291	1.0000							
p-value	0.5327	0.0839	0.2809	0.0533	0.3767								
marriagepolitical	0.0479	-0.2397	-0.3072*	0.0653	0.0170	0.2101	1.0000						
p-value	0.7436	0.0972	0.0318	0.6560	0.9080	0.1474							
relativemp	-0.2239	-0.3492*	-0.0090	-0.1264	-0.0500	0.0129	0.0170	1.0000					
p-value	0.1219	0.0139	0.9510	0.3867	0.7330	0.9298	0.9080						
mayor	-0.1168	-0.1316	-0.2159	-0.0499	0.0550	0.0853	0.2687	0.2092	1.0000				
p-value	0.4243	0.3675	0.1362	0.7337	0.7072	0.5602	0.0619	0.1492					
profession	-0.1884	-0.2187	-0.5166*	0.3702*	-0.0355	0.0413	0.6614*	0.0142	0.3404*	1.0000			
p-value	0.1947	0.1312	0.0001	0.0088	0.8085	0.7782	0.0000	0.9228	0.0167				
age	0.0355	-0.1280	0.1635	0.0747	-0.0303	-0.4574*	-0.4399*	-0.0261	-0.1763	-0.2031	1.0000		
p-value	0.8109	0.3859	0.2669	0.6140	0.8379	0.0011	0.0018	0.8602	0.2306	0.1662			
noble	-0.0619	-0.0053	-0.0260	-0.0495	0.0700	0.2034	0.1798	0.3151*	0.1792	0.1325	-0.1778	1.0000	
p-value	0.6727	0.9709	0.8590	0.7353	0.6326	0.1610	0.2164	0.0275	0.2179	0.3642	0.2266		
education	-0.0292	-0.0084	0.1873	-0.1545	0.2067	0.0961	0.0084	0.2935*	0.0034	-0.0793	-0.0646	0.1563	1.0000
p-value	0.8419	0.9543	0.1974	0.2892	0.1541	0.5114	0.9543	0.0406	0.9814	0.5879	0.6628	0.2835	

In summary, both the road bill dataset and river bill dataset demonstrate that the leading MPs on committees are more likely to be from the ruling party compared to the fraction of MPs in the House who are from the ruling party. This conclusion is true for the entire period of 1690-

1714 and the specific period of 1710-1714 where party strife has been argued to be greater. Our theory suggests that MPs on committees were likely chosen by promoters to raise the probability of successfully passing their respective bills. As a corollary we might expect that the density of ruling party representation in an area affected the likelihood of a bill being introduced and its probability of success. The next section turns to this issue.

v.2 Party Density and the promotion of Bills and Acts

In studying the geographic density of ruling party representation we allow the effects to differ for road and river bills. We also allow the effects of ruling party density to differ at the local and regional level. For each constituency the fraction of ruling party MPs in the closest constituency is analyzed along with the fraction of ruling party MPs among all MPs within 25 miles of the closest constituency. These two variables are labeled ruling party strength, constituency, and ruling party strength, 25 miles, for brevity. In some specifications we also allow the effects of ruling party strength to be discontinuous by analyzing a dummy variable equal to 1 if the fraction of ruling party MPs in the constituency exceeds 0.8 and another dummy equal to one if the fraction of ruling party MPs in the constituency is between 0.2 and 0.8. These two variables are called ruling party strength high and ruling party strength mixed. The omitted group is constituencies where the fraction of ruling party MPs is less than 0.2

We also need to introduce some assumptions about what happens to constituencies once they have had a turnpike or river bill introduced and successfully passed. In the period under study, 1690 to 1715, only one constituency had more than one turnpike act (Middlesex) and only one had more than one river navigation act (Yorkshire). It appears that before 1715 most constituencies had at most one river or road project that could potentially generate enough toll

revenues to pay the fixed costs. Therefore, once a constituency has a turnpike act they are dropped from the turnpike bill sample and once a constituency has a river act they are dropped from the river bill sample. In other words we do not 'treat' a constituency with shocks to ruling party strength once their single feasible project has been approved.

Modeling projects as one-time, irreversible investments motivates an estimating equation based on the discrete time hazard model with an extreme value distribution. Among the constituencies that have not yet had a turnpike (or river) bill let the variable $y_{jt} = 1$ if constituency j has a turnpike (or river) bill introduced in its jurisdiction in year t and 0 otherwise. Our estimating equation is

$$prob(y_{jt} = 1) = \Lambda[\beta rulingpartystrength_{jt} + \delta t + \gamma x_j].$$

where Λ is the pdf for the logit, $rulingpartystrength_{jt}$ is the fraction of MPs from the ruling party within a certain distance, t is a time trend, and x_j is a constituency fixed effect. The prediction is that within constituency changes in $rulingpartystrength_{jt}$ should have a positive and significant effect on the probability a bill is introduced. The time trend captures the increasing likelihood that constituencies have bills introduced irrespective of party considerations. The constituency fixed effect captures time-invariant characteristics of constituencies that might make them more likely to get bills.

Table 9 shows the results for various specifications examining the probability a constituency has a turnpike bill introduced. All specifications report standard errors clustered on the constituency. The general conclusion is that party density did not affect the promotion of turnpike bills. In columns 1 and 2 the effects of party strength in a constituency is shown to have a different sign depending on whether constituency fixed effects are included. Columns 3 and 4

show that increases in party strength within 25 miles increases the probability of a bill, but the coefficient is far from being statistically significant. The conclusions are similar when the effects of local and regional party density are included in the same specification, both within and without constituency fixed effects (columns 5 and 6). Excluding the data to the period 1710 to 1714 when ruling party MPs were especially likely to be on committees does not change the results (column 7). The same holds when we allow for discontinuities through dummies for mixed party strength and strong party strength. The coefficient on the time trend is not reported, but it was generally positive and statistically significant. Thus with the passage of time constituencies were more likely to have turnpike bills introduced. Changes in party seem to matter little by comparison.

Table 9: The effects of Party on Promotion of Turnpike Bills

dependent variable: 1 if constituency has a turnpike bill in year t								
	1	2	3	4	5	6	7	8
Variable	coeff	coeff	coeff	coeff	coeff	coeff	coeff	coeff
	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)
ruling party strength, constituency	0.202	-0.254			0.008	-0.172	0.024	
	0.36	0.724			0.412	0.755	0.597	
ruling party strength high, constituency								-0.094
								0.798
ruling party strength mixed, constituency								0.305
								0.662
ruling party strength, within 25 miles			0.901	-0.725	0.892	-0.555	0.422	-0.552
			0.775	2.297	0.892	2.43	1.17	2.43
Time trend included?	yes	yes	yes	yes	yes	yes	yes	yes

	1	2	3	4	5	6	7	8
Constituency FE?	no	yes	no	yes	no	yes	no	yes
1710-1715 only?	no	no	no	no	no	no	yes	no
N	2607	286	2607	286	2607	286	758	286
Pseudo R2	0.002	0.051	0.014	0.11	0.014	0.111	0.004	0.335

notes: standard errors are clustered on constituency

Turning to river bills we again see that party density does not significantly affect the promotion of bills (see table 10). None of the coefficients is statistically significant. The largest coefficients on the party variables are in the last specification (column 8). Here there is some evidence that having all MPs in a constituency with the ruling party decreases the likelihood of a bill being introduced, but the significance does not meet conventional levels.

Table 10: The effects of Party on Promotion of River Bills

dependent variable: 1 if constituency has a River bill in year t

variable	1 coeff (st. err.)	2 coeff (st. err.)	3 coeff (st. err.)	4 coeff (st. err.)	5 coeff (st. err.)	6 coeff (st. err.)	7 coeff (st. err.)	8 coeff (st. err.)
ruling party strength, constituency	-0.132 0.378	-0.963 0.787			-0.237 0.453	-1.17 0.811	-0.893 0.698	
ruling party strength high, constituency								-1.179 0.758
ruling party strength mixed, constituency								-0.605 0.521
ruling party strength, within 25 miles			0.255 0.492	0.147 1.51	0.492 0.652	1.366 1.71	1.839 1.229	1.44 1.727
Time trend included?	yes	yes	yes	yes	yes	yes	yes	yes
Constituency FE?	no	yes	no	yes	no	yes	no	yes
1710-1715 only?	no	no	no	no	no	no	yes	no
N	2574	226	2574	226	2574	226	755	226
Pseudo R2	0.002	0.051	0.014	0.11	0.014	0.111	0.022	0.113

notes: standard errors are clustered on constituency

The results are more favorable to the view that party density mattered when we study the likelihood of a bill passing. The specification is similar to the previous one. Let the variable $y_{jt} = 1$ if a turnpike (or river) bill is introduced in constituency j in year t and is successful and 0 if a turnpike (or river) bill is introduced in constituency j in year t and fails. Our estimating equation is

$$prob(y_{jt} = 1) = \Lambda[\beta rulingpartystrength_{jt} + \delta t].$$

where all the other variables are the same as before. We do not include constituency fixed effects as there are a small number of constituencies that get bills introduced more than once. It is worth emphasizing again that our theoretical model suggests there may be unobserved quality differences between bills that have a lower cost of matching with MPs. As a result the coefficient on party density might be biased downwards due to measurement error.

The results are summarized in table 11. For turnpike bills there is a positive and significant relationship between success and ruling party strength within 25 miles. For river bills there is positive and significant relationship between the success of bills and ruling party strength in the constituency. Interestingly there is also a negative and significant relationship between the success of river bills and ruling party strength within 25 miles. Overall the results show that ruling party density affected the likelihood of success despite the potential for attenuation. Moreover the effect of party density in nearby constituencies is not always positive as we will explain momentarily.

Table 11: The effects of Party on success of Turnpike and River Bills

	turnpike bills	river bills
	1	2

variable	coeff	coeff
	(st. err.)	(st. err.)
ruling party strength, constituency	-1.32	2.89
	1.31	(1.51)*
ruling party strength, within 25 miles	5.56	-8.94
	(2.45)*	(4.6)*
Time trend included?	yes	yes
Constituency FE?	no	no
N	45	53
Pseudo R2	0.025	0.04

notes: standard errors are clustered on constituency

The net effect of party density can be seen through the likelihood of constituencies getting turnpike or river acts. The probability of a constituency getting an act is studied using the same specification as with bills. Table 12 reports the results for the models that include constituency fixed effects and a time trend. Here we see that the probability of having a river navigation act increases significantly with ruling party strength in a constituency. The coefficient has the same sign for turnpike acts, but is not significant.

Table 12: The effects of Party on success of Turnpike and River Acts

	turnpike acts	river acts
	1	2
variable	coeff	coeff
	(st. err.)	(st. err.)
ruling party strength, constituency	3.24	15.38
	3.66	(4.09)***
ruling party strength, within 25 miles	-1.05	-3.48
	5.22	10.76

Time trend included?	yes	yes
Constituency FE?	yes	yes
N	196	94
Pseudo R2	1	1

notes: standard errors are clustered on constituency

v.3 Close Elections and Party Density

The preceding results suggest some effect of ruling party density on the probability a constituency had a river act, but there may be a concern that changes in ruling party strength are not exogenous even after controlling for constituency fixed effects and the time trend. If so, the estimates for party density may be biased. We investigate this issue using close elections where there was arguably randomness in the strength of party. In some constituencies, seats were not contested and there were no elections. Candidates simply won by default. In other constituencies there were three and sometimes four candidates that ran for two seats. The votes have survived for a sample of these contests and are recorded in Cruickshanks, Handley, and Hayton (2002). We use this data to identify elections where the difference in the vote share between the second and third candidate is less than 5% or less than 7.5%. In these 'close' elections representation could have been different if a few votes were cast differently. Thus the fraction of ruling party MPs is arguably more random in these constituencies.

Our approach is to re-run the logit regressions on the probability of a bill or act being introduced within the sample of constituencies where elections were close. The results are reported in table 13. Columns 1 and 4 show the full sample results for comparison. In general we see no clear difference for the effects of ruling party strength in the constituency. None of the coefficients is statistically significant, although the sample sizes become small when restricting to constituencies with close elections. The only notable change is the estimate for ruling party

37

strength within 25 miles of the constituency. The coefficient is negative and statistically

significant for river bills (see column 5).

Table 13: The effects of Party Density on Bills in close elections

Variable	road bills full sample	road bills vote difference <5%	road bills vote difference <7.5%	river bills full sample	river bills vote difference <5%	river bills vote difference <7.5%
	1	2	3	4	5	6
	coeff	coeff	coeff	coeff	coeff	coeff
	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)	(st. err.)
ruling party strength, constituency	0.008	-0.73	-0.172	-0.237	0.232	0.744
	0.412	0.88	0.891	0.453	1.87	1.99
ruling party strength, within 25 miles	0.892	0.974	0.815	0.492	-4.397	-2.46
	0.892	2.48	2.079	0.652	(1.79)**	1.53
Time trend included?	yes	yes	yes	yes	yes	yes
Constituency FE?	no	no	no	no	no	no
N	2607	103	148	2574	100	144
Pseudo R2	0.014	0.175	0.18	0.014	0.12	0.08

notes: standard errors are clustered on constituency

v.4 Opposition and Party Density

The most pressing concern is that the previous results do not incorporate whether opposition

groups and promoters were in the same constituency. Our presumption is that the promoter is in

in the constituency where the bill is introduced. If only the promoter is in the constituency then

we would expect a positive relationship between ruling party density and the probability of

having a bill introduced or the likelihood of its success. But if opposition groups are in the

constituency then our prediction is ambiguous. We address this issue using detailed information

on the location of opposition groups. From the Journals we observe when groups submit a formal petition against a bill. Their residence is also reported which we then match to a constituency. Thus we code whether the residents of a constituency register opposition to a bill in each legislative term and as before the density of the ruling party in that area. The control group is all constituencies with a 50 mile radius of where the bill was introduced. Constituencies within a 50 mile radius of a project represent the locations where opposition is most likely.

Our specification replicates previous ones. Let the variable $y_{jt} = 1$ if constituency j records opposition to any turnpike (or river) bill introduced within 50 miles of its jurisdiction in year t and 0 if constituency j records no opposition to any turnpike (or river) bill introduced within 50 miles of its jurisdiction. Our estimating equation is

$$prob(y_{jt} = 1) = \Lambda[\beta rulingpartystrength_{jt} + \delta t]$$

where all the other variables are the same as before.

The results for turnpike bills are reported in table 14. We find no relationship between ruling party density and opposition ti turnpike bills, but there is a positive and significant relationship between ruling party density and opposition to river bills in neighboring jurisdictions. We regard the latter finding as the strongest evidence that parties affected the cost of promoting infrastructure bills.

Table 14: The effects of Party Density on Opposition to Bills

variable	Turnpike bills	river bills
	1	2
	coeff	coeff
	(st. err.)	(st. err.)

ruling party strength, constituency	0.181	0.622
	0.665	(.348)*
ruling party strength, within 25 miles	-0.436	-0.626
	1.33	0.69
Time trend included?	yes	yes
Constituency FE?	no	no
N	779	891
Pseudo R2	0.014	0.026

notes: robust standard errors are reported

VI.   Conclusion

The Glorious Revolution of 1689 is one of the most hotly debated political transitions in history. In the aftermath the Whig and Tory parties traded places as the majority in the House of Commons six times between 1690 and 1715. Some scholars have suggested that political parties encouraged rent seeking in this fractious period. In this paper, we study whether parties influenced the allocation of infrastructure improvement rights in Parliament. We find evidence that constituencies were more likely to get a river improvement act if more of their representatives in the House of Commons were affiliated with the ruling party. We also find that groups in a constituency were more likely to oppose river improvement bills in neighboring jurisdictions if they were more strongly represented by the ruling party. Our conclusion is that party politics slowed some infrastructure projects in the post-Glorious Revolution period and accelerated others, imparting a political bias. Britain had not yet achieved open access by 1715. The political transition following the Glorious Revolution was not entirely glorious.
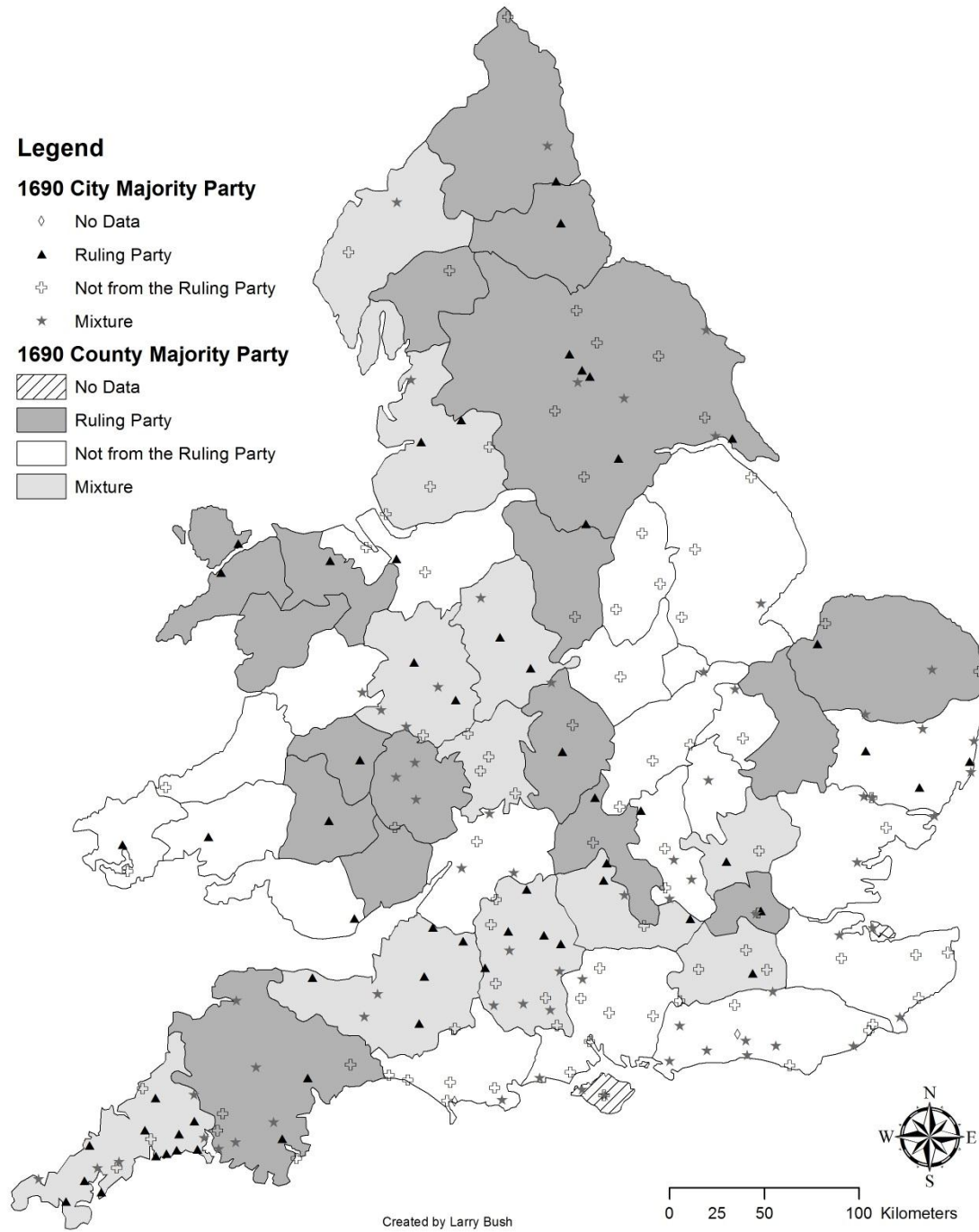
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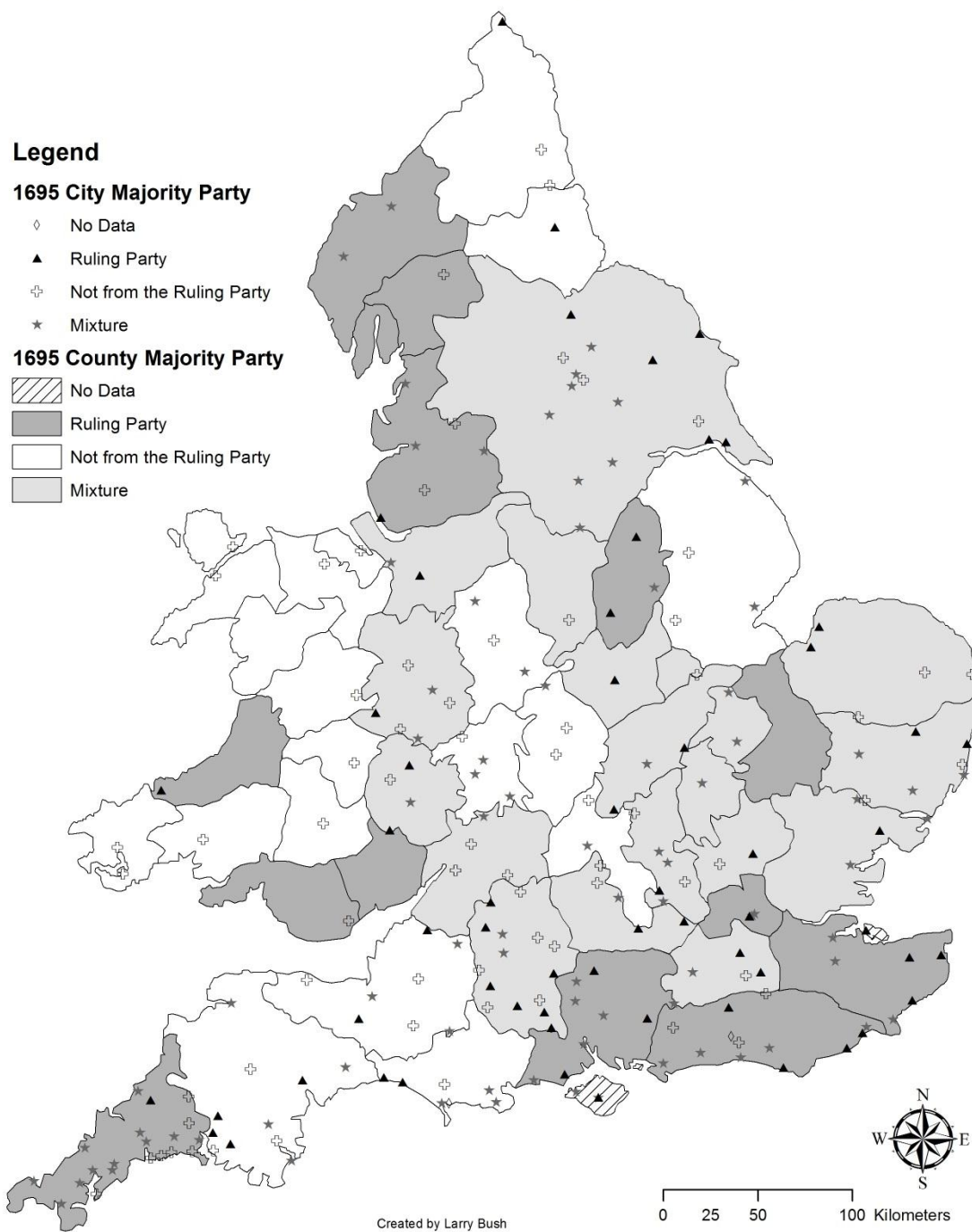Langford, P., *Public Life and the Propertied Englishman*. (Oxford, 1991).

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England and Wales House of Commons Fraction 1690

Legend

1690 City Majority Party
◇ No Data
▲ Ruling Party
✛ Not from the Ruling Party
★ Mixture

1690 County Majority Party
⧄ No Data
▨ Ruling Party
☐ Not from the Ruling Party
▨ Mixture

Created by Larry Bush

England and Wales House of Commons Fraction 1695

Legend

1695 City Majority Party

◇ No Data

▲ Ruling Party

✛ Not from the Ruling Party

★ Mixture

1695 County Majority Party

▨ No Data

▨ Ruling Party

☐ Not from the Ruling Party

☐ Mixture

Created by Larry Bush

0   25   50   100 Kilometers

England and Wales House of Commons Fraction 1698

Legend

1698 City Majority Party
◊ No Data
▲ Ruling Party
✛ Not from the Ruling Party
★ Mixture

1698 County Majority Party
▨ No Data
▨ Ruling Party
☐ Not from the Ruling Party
☐ Mixture

Created by Larry Bush

0   25   50   100 Kilometers

England and Wales House of Commons Fraction 1700

Legend

1700 City Majority Party

◇ No Data

▲ Ruling Party

✚ Not from the Ruling Party

★ Mixture

1700 County Majority Party

▨ No Data

▨ Ruling Party

▢ Not from the Ruling Party

▨ Mixture

Created by Larry Bush

0   25   50   100 Kilometers

England and Wales House of Commons Fraction 1701

Legend

1701 City Majority Party

◇ No Data

▲ Ruling Party

✛ Not from the Ruling Party

★ Mixture

1701 County Majority Party

▨ No Data

▨ Ruling Party

☐ Not from the Ruling Party

☐ Mixture

Created by Larry Bush

0   25   50   100 Kilometers

England and Wales House of Commons Fraction 1702

Legend

1702 City Majority Party
- ◇ No Data
- ▲ Ruling Party
- ✠ Not from the Ruling Party
- ★ Mixture

1702 County Majority Party
- ▨ No Data
- � Ruling Party
- ▢ Not from the Ruling Party
- ▢ Mixture

Created by Larry Bush

0   25   50   100 Kilometers

England and Wales House of Commons Fraction 1705

Legend

1705 City Majority Party

◇   No Data

▲   Ruling Party

✚   Not from the Ruling Party

★   Mixture

1705 County Majority Party

▨   No Data

▨   Ruling Party

☐   Not from the Ruling Party

☐   Mixture

Created by Larry Bush

0   25   50   100   Kilometers

England and Wales House of Commons Fraction 1708

Legend

1708 City Majority Party

◇   No Data

▲   Ruling Party

✛   Not from the Ruling Party

★   Mixture

1708 County Majority Party

▨   No Data

▓   Ruling Party

☐   Not from the Ruling Party

▤   Mixture

Created by Larry Bush

0   25   50   100   Kilometers

England and Wales House of Commons Fraction 1710

Legend

1710 City Majority Party

◇ No Data

▲ Ruling Party

✛ Not from the Ruling Party

★ Mixture

1710 County Majority Party

⬚ No Data

⬛ Ruling Party

⬜ Not from the Ruling Party

⬚ Mixture

Created by Larry Bush

0 25 50 100 Kilometers

England and Wales House of Commons Fraction 1713

Legend

1713 City Majority Party

◇ No Data

▲ Ruling Party

✚ Not from the Ruling Party

★ Mixture

1713 County Majority Party

▨ No Data

▦ Ruling Party

☐ Not from the Ruling Party

▢ Mixture

Created by Larry Bush

0 25 50 100 Kilometers