# It Takes Money to Make MPs: New Evidence from 150 Years of British Campaign Spending*

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**Abstract**

What is the relationship between money and votes and how did it evolve over time? In particular, how does the introduction of new campaigning technologies and political parties interacts with campaign spending? In this paper, we investigate these questions using a new exhaustive dataset on campaign spending and votes in the United Kingdom from 1857 to 2017, which includes not only detailed election expenses for 69,291 election-constituency-candidates, but also extensive candidates' characteristics as well as constituency-level socio-demographic controls. We show that the strength of the relationship between campaign spending and votes has increased over time, peaking in the last quarter of the XXth century, and then decreased concomitant to the introduction of the Internet. We link this evolution to changes in electoral competition, conduct of campaigns, and candidates' characteristics. Finally, we propose two new instrumental variables based on historical events to pinpoint the causal impact of spending on votes.

**Keywords**: Elections, Campaign financing, Campaign expenditures, Campaigning technologies, Candidates' characteristics
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# 1 Introduction

What is the impact of money on votes and how did it evolve over time? In particular, how does the introduction of new campaigning technologies affect the relationship between campaign spending and electoral results? While there is an important literature on campaign finance, its focus is mainly on recent decades. Yet, many argue that with the introduction of new technologies, in particular the Internet, it has become increasingly cheaper for candidates to run in elections. However, despite the intrinsic policy significance of campaign finance regulations, there is little empirical evidence on the impact of the introduction of new campaigning technologies on the role played by money in elections. Similarly, we know little about the effect of changes in the electorate and in electoral competition on the efficiency of campaigning.

In this paper, we tackle these questions by investigating the effect of campaign spending on votes in the United Kingdom over a very long period of time – 1857-2017 –, which covers important innovations in electoral regulations, technologies and environments. The UK was the first country worldwide to require the candidates to lodge the details of their campaign expenses (in 1854) and to introduce limits on campaign expenditure (in 1883). We collect data from the UK *Parliamentary Papers* and build an exhaustive dataset on campaign spending by category (printing; public meetings; etc.), covering 40 elections and $20,263$ election-constituencies, for a total of $34,330$ unique candidates. We use the *Times Guide to the House of Commons* to gather detailed biographical information for almost all of these candidates since 1929; and the Decennial Censuses from 1861 onwards to assemble socio-demographic controls for all the election-constituencies. It is, to the best of our knowledge, the most exhaustive data on spending and votes over the long run available to researchers.

We start by reviewing the historical changes in the conduct of campaigns and their technologies, from the open-air election meetings to the targeting of voters on the Internet, and relate these qualitative accounts to aggregate statistics from our campaign spending data We document that the average total amount spent (per registered voters) by candidates has decreased dramatically, in constant terms, over time – and even more so when normalized by average earnings: a candidate in the 1860's and 70's spent on average the equivalent of 21 annual households revenues, while in the XXIth century this number would decrease to 0.18. At the same time, the number of candidates increased significantly, and their biographical characteristics evolved.

We then investigate the long-run patterns of the relationship between campaign spending and votes. To do so, we use a Conditional Logit Model to estimate the average effect of candidates' electoral expenditures on vote shares. Our estimations, that include fixed effects for districts interacted with elections and, in some specifications, fixed effects for candidates (to capture unobserved candidate heterogeneity), also control for districts' characteristics (socioe-

conomic data, age structure and occupations) as well as for detailed candidates' characteristics (age, gender, diploma, previous occupation and political mandates). In all specifications, we find a positive and statistically significant correlation between the candidates' spending and the vote shares they obtain. On average, a one-percentage point increase in the spending share of a candidate is associated with a 1.1% increase in her vote share. The magnitude of this effect is economically significant: in our most conservative specification, an increase by €5.8 in campaign spending is associated with one additional vote.

Second, we show that the strength of this relationship displays significant variation over time. In particular, the magnitude of our estimated coefficients is twice higher during the last three decades of the XXth century than in the previous period – a results that contrasts with the general consensus in the political science literature on the importance of local campaigning (see in particular Kavanagh, 1995; Butler, 1989). Besides, we find that the efficiency of campaigning then declines in the early 2000's, concomitant to the introduction of the Internet. We show that these patterns can be rationalized by changes in the closeness of the elections (as measured by the winning party's margin at the previous election).[1] According to our estimates, the closer the elections, the more efficient campaign spending (which is consistent with a mobilization effect of campaign spending (Jacobson, 2015)). Similarly, we link these patterns with the characteristics of candidates: in particular, older candidates have a lower correlation between their spending and results, while the average age of candidates dramatically increased in 2001. This stresses the importance of understanding the historical dynamics of political selection (Cagé and Dewitte, 2019).

Finally, we discuss the issue of causality. Our estimates, even if they capture unobserved candidates' characteristics, may still suffer from endogeneity issues common with campaign spending data, in particular if financial contributions to candidates follow their popularity. A number of papers in the literature have tried to address this endogeneity: e.g. Levitt (1994) uses repeat challengers in US Congressional elections; Gerber (1998) instruments spending with variables that affect a candidate's ability to raise campaign funds; Spenkuch and Toniatti (2018) exploit exogenous variation in the number of impressions across county borders driven by Federal Communications Commission regulations; and Bekkouche and Cagé (2018) exploit changes in campaign finance legislation. Using the specifics of the UK history, we eventually propose two new instruments for campaign spending. The first one relies on shocks in Trade Union political funding, and the second on changes in spending limits due franchise extension. In both strategies, we show that the instrumented change in a candidate spending has a positive and statistically significant effect on the change in the vote share obtained by this candidate. Hence, the correlation we document between spending and votes does not seem to

[1] We test for and overrule alternative explanations in terms of political competition, in particular changes in the spending limits and in the strength of party identification.

be entirely driven by the endogenous nature of campaign spending.

**Literature review** Our article first contributes to the large literature on campaign expenditures and votes. While the focus of this literature has mainly been on the US (Jacobson, 1978, 1980, 1985, 1990, 2006; Abramowitz, 1988; Green and Krasno, 1988; Gerber, 1998; Levitt, 1994), our paper is one of the first attempts at estimating the impact of spending in another Western democracy. Bekkouche and Cagé (2018) estimate the effects of campaign expenditures on local elections in France, but they only consider the 1993-2014 time period. Similarly, in their study of the effects of campaign spending limits in Brazil, Avis et al. (2017) consider the 2012 and 2016 mayoral elections. On the contrary, our empirical setting covers more than 150 years of data, and includes information on spending by expenses categories. It allows us to provide (to our knowledge) the first estimates of the historical evolution of the relationship between spending and vote.

To our knowledge, the only other paper using UK campaign spending data over a long time period is Fouirnaies (2018). Relying on the same data source for expenditures (the *Parliamentary Papers*[2]), he investigates the extent to which the introduction of spending limits has impacted political competition between 1885 and 2010. He finds that a decrease in spending limits decreases average total spending, increases the number of candidates running, and decreases the incumbency advantage. While the research question of our paper – the relationship between campaign spending and votes – clearly differs to his – the impact of spending limits on electoral competition –, we view them as complementary; in particular, our results help informing the mechanisms behind his finding regarding political selection. Furthermore, compared to this work, we also contribute to the existing literature by providing additional new data. On the one hand, we build a rich dataset on constituency-level controls, merging together historical census data from different sources. On the other hand, we construct a new dataset on candidates' characteristics using biographical data. These new data would be of use in the future for researchers willing to study the determinants of the vote and the dynamics of political selection.

Besides, our paper contributes to the literature that investigates whether campaigning impacts electoral results, in particular through the use of new media technologies. Following the seminal work of Eldersveld (1956), a number of papers in the literature have used natural or randomized experiments to evaluate the effectiveness of a wide array of campaigning methods on votes[3]: positive effects have for instance been found for door-to-door canvassing (Braconnier et al., 2017; Pons, 2018) and lawn signs (Farrer et al., 2016), but not for robotic phone

[2]We have built our expenditures dataset simultaneously, using the same archival paper data. Our data go back to 1857 – when candidates' expenditures were reported for the very first time – while Fouirnaies (2018) begins his analysis in 1885, with the introduction of spending limits.

[3]On their effect on turnout, see Panagopoulos and Green (2008) for a literature review, and examples in Gerber and Green (2000) for the US, and Fieldhouse et al. (2013) for the UK.

calls (Shaw et al., 2012). Similarly, researchers have looked at the effects of political advertising, producing mixed evidence depending on the broadcasting technologies. Larcinese and Miner (2018) highlights the role played by the Internet in increasing Democratic vote shares at the 2008 US presidential election, while Broockman and Green (2014) find that Facebook ads might have help voters recall candidates' names, but not favoring them in the polls. If TV political advertising has little effect on aggregate turnout (Krasno and Green, 2008), it could impact electoral results by changing the composition of the electorate (Spenkuch and Toniatti, 2018) or voters' preferences (Gerber et al., 2011). Finally, Larreguy et al. (2018) show that radio advertising in Mexico only benefited candidates from specific parties. While these studies are particularly helpful in understanding the channels through which campaigning influences votes, they usually estimate the effect of spending at a given moment of time. Yet, it is likely that both the costs and effectiveness of campaign technologies have evolved over time: we contribute to this literature by investigating these historical changes.

The remainder of the paper is organized as follows. Section 2 below provides historical background on the introduction and the evolution of campaign finance regulation in the UK, and describes today's rules. Section 3 introduces the new dataset we built for this study and provides descriptive statistics. Section 4 investigates the long-term relationship between campaign spending and votes, and highlights several dimensions of heterogeneity. Section 5 pinpoints the causal impact of spending on votes. In Section 6, we perform a number of robustness checks, discuss the different mechanisms at play and the external validity of our results. Finally, Section 7 concludes.

## 2 Historical background and today's rules

In this section, we provide a historical and regulatory background on these elections; we briefly describe their key characteristics and actors, as well as the rules applying to campaign finance. We then discuss how electioneering and its technologies evolved over time.

### 2.1 General elections in the UK

**Overview** Between 1857 and 2017, 41 General Elections took place in the UK. The time interval between two general elections is set at five years (seven, before 1911), assuming no earlier election is called. Before the 2011 Fixed-term Parliament Act, the law allowed Prime Ministers to dissolve Parliaments before their maximum duration was attained, and in practice, this has always been done: no Parliament has ever reach its expiry, and the time interval between elections has sometimes been as short as seven months. The current (2011) Act requires a "no confidence vote" or a two-third majority vote at the House to dissolve the

Parliament, which tempered the variation. The average interval between two elections in our data is 4 years.[4]

Elections are held in parliamentary constituencies, each one electing one (or two, until 1948) Member of Parliament (MP) in a first-past-the-post system (or block-vote system, for two-member ones). The number of constituencies and their boundaries have changed over time, to adapt to the evolution of demography, and are administered, since the *House of Commons (Redistribution of Seats) Act 1944*, by independent bodies called the "Boundary Commissions".[5] In this article, we consider all the British constituencies – Ireland is excluded given the particular political history of the country. There is a median number of 613 constituencies per election.

**Running and voting rights** At the beginning of our period, only men with sufficient property qualifications – the "franchise" – were eligible to vote at General Elections. Over the course of the 19th and early 20th centuries, "Four Reform Acts" (1832, 1867, 1884 and 1918) progressively extended the franchise up to universal male suffrage. Overall, the size of the electorate in Great Britain increased from 5.4 million in 1885 (17.4% of the population) to 21.8 millions in 1918 (56.1%) (see online Appendix Figure C1). 1918 is also the year of the first General Elections where women could vote, provided they were above 30 and meet specific franchise requirements. Women gained the right to vote on equal terms as men in 1928. Finally, in 1969, the minimum age for voting was lowered from 21 to 18.

The right to run for election is granted to anyone with the right to vote and who does not enter specific disqualification categories.[6] Provisions were also made to exclude individuals in jail or deemed mentally insane. Since the RPA 1918, a deposit system has been implemented to deter the less serious candidates: candidates would pay £125 (£500 since 1983) upon registering, and they would get their money back only if they attained 12.5% (5%) of the votes.

**Political landscape and parties** General elections in the UK are fought between individual candidates. However, most candidates choose to use the label of a political party while campaigning.[7] By the end of the XIXth century, the two main parties were the Tories (now Conservatives) and the Whigs (the Liberals). The Labour Party was created in 1900 by Trade Unions and Socialist Societies, but remained relatively minor in electoral importance before World War I. Benefiting from ideological dissensus and organizational failures among

[4] While a number of elections took place within the same year – e.g. in 1910 or in 1974 – there are only two occurrences of a larger than 5-year gap due to the two World Wars.

[5] This relative independence means that there is little gerrymandering in the UK. However, it does not prevent commissions or their recommendations to sometimes favor a political party (Johnston et al., 2017).

[6] These categories slightly changed over the years, but generally included several members of the police and army forces; members of the judicial system; bishops and civil servants.

[7] Only since 1969 are candidates allowed to display their party affiliation on the ballot paper.

the Liberals in the following decade, the Labour party was able to form minority governments in 1923 and 1929. Since then, power alternated between the Labour and the Conservatives; the Liberals, although merging with the Social Democratic Party (Labour dissidents) in the 1980s, had to wait 2010 to enter back government, in an alliance with the Conservatives.

Among the smaller parties, worth mentioning are the Scottish National Party (SNP) and the Plaid Cymru (PC), respectively in Scotland and Wales. Both created in the inter-war period with an objective to defend local interests, they grew in importance over the century to gain, at least in the case of the SNP, significant influence on national politics. Similarly, the UK Independence Party (UKIP) was founded in 1991 (originally as the Anti-Federalist League) with a strong Euroskeptic position, and became, over the last two decades, an important and heavily-mediatized political player, in particular over Brexit debates. Our focus in this article will mostly be on the Conservative, Liberal, Labour, and UKIP parties; candidates from other parties or running independently are gathered together in an "other" category.

It should be noted that, until the Registration of Political Parties Act 1998 and, more importantly, the Political Parties, Elections and Referendums Act 2000 (PPERA), political parties in the UK enjoyed a great autonomy, in the sense that very few legislation were addressing their status directly (Ewing, 1987). As organizations, they fell under the wide "unincorporated association" category, meaning they were mostly bound by their own internal rules, which would constitute a formal contract with each member. One consequence is that no transparency whatsoever was required with respect to their funding and expenses, neither would they be eligible for direct public funding.[8] The aforementioned acts introduced formal registration and financial transparency, and the Election Order 2002 a "Public Development Grant" of £2 millions to be split among parties with at least two seats in the House.

## 2.2 Candidates' campaign spending

**Definition and disclosure** Since the 1854 Corrupt Practices Prevention Act, candidates have been required to lodge the details of their expenses with specially appointed Election Auditors.[9] Election expenses include all the spending incurred by a candidate for the promotion of her candidacy. Initially, no time period was clearly defined – in order to allow for case-to-case appreciation – but the PPERA 2000 set up a "regulated period", which would start at the official dissolution of Parliament – or, if later, the day after the candidate's nomination – and end on the day of the election. In most cases, this period varied from 3 to 6

[8] Public funds were allocated to Opposition parties of the Commons since 1974, and of the House of Lords since 1996, but were technically restricted to the conduct of parliamentary duties. Moreover, their amount have always been very low. The *Capital Transfer Tax Act 1984* exempted from inheritance tax all donations to parties with at least two seats in the House. Note also that there is no public reimbursement of campaign expenditures in the UK. For more details regarding the funding of parties, see Cagé (2018).

[9] See in particular Ewing (1987); Johnston and Pattie (2014).

weeks.[10]

**Limits** Limits to campaign spending have been set by the *Corrupt and Illegal Practice Act 1883* (CIPA), thereby applying for the first time in the 1885 General Election. These limits included all the aforementioned expenditures incurred by candidates or their agent[11] over the course of their campaign, to the exception of their personal expenses (e.g. travel and accommodation) and of those covering Returning Officers charges. The 1918 Representation of the People Act also excluded from the limit the salaries of election agents (provided they do not exceed a certain amount), but they were included again by the 1948 RPA.

The formula used to calculate the effective limits has remained the same over the years: a fixed amount plus a variable one depending on the number of registered voters. Those amounts differed whether a constituency was a borough or a county, and were modified regularly to adapt to the changes in both the cost of living and the electorate. We report the spending limit formula in the online Appendix Section A.2; online Appendix Figure A2 plots the evolution of this limit. We observe two large drops in the spending limit: one in 1918 (with a drop for all the constituencies) and one in 1928 (with a drop for the counties). These decreases occurred because of increases in the electorate: most MPs feared a rise in spending they could not (Liberal and Labour) or did not want (Conservative) to afford. The third reform decreasing the spending limit was passed in 1948 by the first Labour majority government, in order to decrease the burden on its candidates-to-be. Finally, in 1970, there was an increase in the limit to cope up with the changes in the cost of living. Since then, the limits have been indexed to inflation and are readjusted before every election.[12]

## 2.3 The conduct of campaigns and their technologies

Over the 19th, 20th and 21th centuries, the way candidates campaign has changed radically, in particular with the appearance of new modes of communication and broadcasting technologies. This section documents these changes.

**The (news)paper-only epoch** The 1867-1885 period of electoral reforms, in particular the 1872 Secret Ballot Act, meant the birth of political campaigns as we understand them (Kavanagh, 1995; Lawrence, 2009). No more hustings or succinct voters' lists to canvas directly and observe at the poll; candidates had to find new ways to reach the mass of

[10] To account for the fact that campaigns could start before the official dissolution of Parliament when their expiry were coming close, the Political Parties and Elections Act 2009 sets that a proportion of the expenses incurred after the 55th month of Parliament by candidates(-to-be) was also part of campaign expenditures (Johnston and Pattie, 2014).

[11] Election agents are candidates' campaign managers, upon which most of the administrative and legal requirements – such as the payment, recording, and transmission of election expenses – fall. The 1883 Act limited their number to one per candidate; and a candidate can be her own agent.

[12] See online Appendix Section A.2 for additional details on the evolution of spending limits.

anonymous electors on which their fate lied. Hence the growth of open-air election meetings, often vehement and even disturbed by the opposition, where candidates, at times simply standing on a chair or improvised scene, had to present their view and face public inquisition. Although exhausting – without amplification and comfortable transportation –, and of a doubtful efficiency – candidates were often addressing non-voters –, these meetings represented an essential step to assert candidates' legitimacy (Lawrence, 2009).

Election candidacies were, at the time, the privilege of an elite. Admittedly, by controlling and limiting for the first time election expenses, the *CIPA 1883* incentivized the creation of local party organizations and the use of volunteers (Lawrence, 2009)[13] - but these new limits were initially set extremely high. Besides, until 1918, candidates had to bear the cost of organizing elections in their constituencies (the *Returning Officers' expenses*).[14]. To this was to be added the costs of "nursing" the constituency – i.e. be (financially) involved in local activities and patronizing organizations, which, although having been drastically reduced by the 1883 qualifications of allowed expenses, were still widespread (Gwyn, 1962; Rix, 2008) –, and the potential loss of work revenues – MPs were not paid before 1911. As a result, only the very rich could afford running for elections.

The main technological innovations of this period are to be found in printing, with techniques such as offset-lithography and rotogravure, opening a new era of paper-based propaganda through two key channels: election leaflets and the press (Lawrence, 2009). At the time highly local and politicized, the latter also experienced, with the creation of titles such as the *Daily Mail* and the growth of commercial advertising, a move towards a more visual and attractive format – an opportunity quickly understood by political parties, which bought an increasing share of advertising space and printed leaflets and posters by millions. It was even not uncommon to see candidates subsidizing – or even buying – newspapers, few months before a contest to boost their popularity (Dawson, 1992; Kavanagh, 1995).

**The radio days** The inter-war period was a time of more humble and low-profile politics (Lawrence, 2009). The war had tempered exuberance – both financially and emotionally – and the RPA 1918, by controlling more strictly candidates' and third parties' expenses while extending the electorate, practically ended the nursing of constituencies and other lavish practices of the Edwardian period (Denver and Hands, 1997). Besides, if microphonic technologies allowed meetings to grow in size, speeches became less intended to arose popular feelings than to expose opinions to an unassertive and peaceable crowd (Lawrence, 2009). These meetings, always more numerous with the rise of motor vehicles increasing the visibility of candidates,

[13]Before 1885, candidates sometimes managed, through their election agent, hundreds of paid campaigners (Denver and Hands, 1997).

[14]Some researchers actually argue that the rise of the Labour Party as a major contender in the inter-war period is directly linked to the 1911 and 1918 reforms (Dawson, 1992).

remained the central location of British politics (Joyce, 2004).

At the same time, the invention of radio – the BBC was created in 1922 – and the first political broadcasts in cinemas – which appeared in the early 1930's – led to the rise of national party figures, while building a more intimate connection between them and electors (Lawrence, 2009). In 1929, a quarter of British homes had a radio license; by 1935, they were almost two-thirds able to hear the national parties' studio recordings (Swaddle, 1988). But these new broadcasting technologies, managed and used mostly by the (growing) central parties, were still far from replacing election meetings. If anything, they came as partial substitutes to the press, which faced increasing skepticism from both candidates and voters (Lawrence, 2009). As a matter of fact, becoming much more centralized, magnates of Fleet Street could now influence elections *nationally* and oppose candidates more directly, raising hostility. This concentration of press titles also made it much harder for a candidate to acquire a local media (Dawson, 1992).

That being said, local parties still relied heavily on the written word, with the posters as a main weapon of war (see e.g. Roudaut, 2016). Leaflets, produced either by national and local machineries, grew in numbers as the RPA 1918 provided every candidate with one free postal delivery to all the registered electors (Denver and Hands, 1997).

**The television time** If elections of the first decades following WWII remained in the relatively same – low-key – tone as those preceding, evolutions in both the media landscape and parties strategies changed the ways campaigns were conducted. The traditional outdoor advertisements, such as posters or meetings, which were so popular in the inter-war period, became indeed progressively disregarded to the benefit of a new emerging media: television. Initially a few thousands at the end of the war, approximately 50% of British homes were equipped with a TV set in 1955; by 1964, the number was almost 90% (Lawrence, 2009). The first political broadcast dates back to 1951, the first live debate to 1955, and 1959 was the first time elections were covered by the news bulletin. But as the 1949 RPA had made clear that any constituency-targeted broadcast had to enter candidates' expense limits, local parties avoided directly using this media. Besides, this centralization phenomenon was further strengthened by developments in electoral studies. Two-party politics at its heights, experts were estimating that a vast majority of voters were already settled on their vote months before an election, and very few of the remaining ones would change their mind *because* of a campaign (Lawrence, 2009). As a result, parties started to focus on bringing their own supporters to the poll, and campaigns were conducted in extraordinary isolation (Butler, 1989). One major consequence of these phenomena was that local campaigns became totally overshadowed by national politics, both in the mind of the parties and in those of political scientists (Lawrence, 2009; Johnston and Pattie, 2014). But if it is true that local party organizations have known,

during this period, a relative decline – as measured by the number of members or election agents, it did not mean the end of constituency campaigning, especially in marginal seats.

An increasing use was made of the local press for advertising, and newspapers continued to relay speeches or statements from candidates. The period also saw the birth of the "walk-abouts": candidates engaging discussions with their constituents through random walks in chosen neighborhoods. Well-organized local parties also go "knocking-up", i.e. visit, during election day, their supporters who had not yet voted, based on screenings made at the front of polling stations (Denver and Hands, 1997).

Only in the 1970's did the tendencies towards nationalization and mass broadcasting of campaigns became fully accomplished, bringing the electoral communication to a new era (Lawrence, 2009). Before 1974, political appearances on TV remained a relatively rigid and formal exercise, on which parties had a clear control. With the coming of live audiences, phones-in and spontaneous interviews, candidates were put into more dynamic and fragile positions. Outside of the broadcasting room, the growth in the number of tabloids, television channels and cameras was to boost the intensity of coverage, and the competition for electors' attention grew dramatically (Denver and Hands, 1997).

Candidates resorted to a wide array of innovations to revive election periods – some even organized torchlight processions or festivals (Lawrence, 2009), and increased the number of walkabouts and canvasses, which were becoming a way to catch local media attention – including the growing number of local radios and regional TV channels. Computer-based registers of voters saved hours of address handwriting (Lawrence, 2009) and improved the efficiency of knocking-up (Denver and Hands, 1997). They also set the path for targeted campaigning, initially through mailing (Swaddle, 1988) and, in the 1990's, faxes (Fisher and Denver, 2009; Denver et al., 2003) and telephones (Lawrence, 2009). Overall, the whole process of campaigning became, with the increasing use of professional consultants and marketing techniques (Wring and Ward, 2010; Lawrence, 2009), more "professional". Interestingly, this was concomitant to a reappraisal of the effect of local campaigning by the academic community (see for instance Whiteley and Seyd, 1994; Pattie, Charles; Whiteley, Paul; Johnston, Ron; Seyd, 1994; Denver and Hands, 1997).

**The Internet era** All four 1997-2010 elections have been labeled the "first Internet election" (Wring and Ward, 2010). While the BBC opened its website in 1997, one has to wait the early 2000's to see the new technology having a significant coverage in the UK: at the 1997 General Elections, only 2% of British homes reported using the Internet; in 2001, 33% did (Coleman, 2001).[15] Similarly, while in 1994 no MP had ever used emails to reach her constituents, by 2002, they were 73% to have done so (Coleman, 2001) – and by 2010, two-third

[15]High-speed broadband Internet came in the early 2000's, with the number of households connected increasing from 6% in 2003 to 74% in 2011 (Gavazza et al., 2018).

of the main parties' candidates had a website (Wring and Ward, 2010).

In a world where targeted-campaigning was ever increasing, the Internet has improved the collection and redirection of voters' data (Wring and Ward, 2010). At the same time, political parties' websites have become channels of information on parties themselves, though often targeted towards rational and partisan viewers (Jackson, 2018). But Internet promise to bring back unmediated political communication (Coleman, 2001) has been quickly challenged by the rise of social media platforms. If anything, the Internet has rendered obsolete some of the old medias, starting with the posters, whose digitalization meant they could be easily modified and mocked (Wring and Ward, 2010).

In the following section, when providing descriptive statistics for our main variables of interest, we split our sample into five periods, broadly corresponding to those historical changes.

## 3 Data and descriptive statistics

We create a new, exhaustive dataset on campaign expenditures and electoral results at the candidate level in the United Kingdom for all the General Elections since 1857. Producing these data is our first contribution. We do so by computing and merging information from the UK's "election expenses reports", transmitted after every General Election (but the 1918 one, for which no data has been published) since the *Corrupt Practices Prevention Act 1854* to the returning officers, and published in the UK *Parliamentary Papers* as the "*Return of expenses of each candidate at the General Election*". The data transmitted includes, for each candidate, all the expenses incurred during the campaign, detailed into a number of different categories – e.g. printing and advertising, public meetings, etc.. It also includes the number of votes polled by each candidate, the number of polling districts and stations, the number of electors, and the number of persons entitled to vote by post. Online Appendix Figure C2 shows an example of these data.

As they are self-reported, one can question how reliable these expenses data are. According to Gwyn (1962) and Pinto-Duschinsky (1981), the figures for the 1857-1880 years have to be taken with caution. As it imposed caps on total spending, the *CIPA 1883* introduced stricter controls on expenses, in particular by facilitating the use of Election Petitions to notify abnormal spending, and by increasing the threat of punishment. Offenders risked criminal convictions, heavy fines or, at least, their election declared void. The latter happened many times all over the century, for various reasons: e.g. the 1923 Berwick-upon-Tweed's election was canceled because the winner's agent had agreed with the local printer to decrease by £100 his official bill, while in 1911 Hull's winning candidate had made distributed 250 bags of coal to the poor. Since 2000, the Electoral Commission acts as a watchdog, and failures by candidates to properly report spending leads to fines and investigations by the Crown

Prosecution Service. Most observers agree that, since the late XIXth century, expenses data can be considered reliable.

### 3.1 Electoral results

Our 1885-2017 dataset covers 35 elections, 20,263 election-constituency observations, and 65,387 election-constituency-candidate observations. For the sake of consistency, we drop the constituencies in which citizens were voting to elect two MPs (the so-called "double-seat constituencies") by block (or "plurality-at-large") voting[16]: these constituencies represent 1.39% of all the constituency-year observations in our sample. We also drop the 851 constituencies-year (4.27% of the sample) that were uncontested – i.e. with only one candidate running for the seat.

Given many candidates run in multiple General Elections, we have created a unique candidate identifier based on their first name and surname. In the end, we obtain a total of 32,025 unique candidates.

**Number of candidates running** On average, during our time period, 3.3 candidates run in each of the constituencies (see Table 1 for summary statistics). We observe an increase in electoral competition over time, in particular since the 1970's. In the last General Elections covered by our data, 2017, 5 candidates ran on average. We come back to this point later, given it may be linked to the emergence of new – and cheaper – campaigning technologies. Fouirnaies (2018) provides another likely explanation through the tightening of spending limits, which is also consistent with the results of Avis et al. (2017) in the case of Brazil.

[Table 1 about here.]

### 3.2 Campaign expenditures

Table 2 reports summary statistics on campaign spending.[17] Over time, we observe a dramatic drop in the total spending by candidates (from £83,893 on average in 1885-1911 to £4,837 in 2001-2015). This is at least partially due to the changes in spending regulations that we have described above. Furthermore, the historical drop in the spending per voter is also due to the extension of the franchise (i.e. the increase in the number of registered voters per constituency).

Note however that despite the introduction of spending caps, an important share of the candidates spend much less than the legal maximum, in particular in recent years. While the

[16] Besides, candidates from the same party were allowed to return a single report expenses which makes these constituencies very complicated to analyze (given one cannot allocate spending between candidates).

[17] Elections are gathered together into five time periods. See the online Appendix Tables B1, B2, and B3 for data for each of the elections.

average spending as a share of the legal maximum was equal to 75% of the limit on average in 1885-1911, it is of only one third of the limit in the recent period. While this drop is partly driven by the increase in the number of candidates – with the entry of relatively "small" candidates – this is not the only explanatory factor. If we focus on the main three parties – the Labour, the Liberal, and the Conservative – we indeed see a drop in the spending as a share of the spending cap from 77% in 1885-1911 on average to 47% in 2001-2017. Note that there is no public reimbursement of campaign expenditures in the UK; hence if the candidates do not raise enough money from donations, all the spending they incur for their campaign comes from their own pocket.

[Table 2 about here.]

How do campaign expenses vary depending on the political party of the candidates? Figure 1 plots the average total spending of the candidates, depending on the time period and on the political party to which they are affiliated. Candidates of the Conservative Party always spent more on average than their opponents. This is consistent with evidence from other countries (see e.g. Bekkouche and Cagé, 2018), and also with the fact that right-wing parties tend to receive more donations than their left-wing counterparts (Cagé, 2018). While until WWII candidates of the Liberal Party spent more on average than candidates of the newly created Labour Party, this is no longer the case since the 1950's.

[Figure 1 about here.]

**Expenses by categories** Our expenditure data include information on the different categories of spending.[18] The main expenses categories subject to the legal maximum for the 1885-2001 period are (i) the printing expenses (on printing, stationery, etc.) that include the advertising expenses; (ii) the expenses on public meetings, such as the payment of speakers or refreshments; (iii) the expenses on committee rooms, usually used to organize the campaign; (v) the expenses on agents, overseeing the campaign; (vii) the expenses on clerks and messengers; and (viii) the other expenses (on miscellaneous matters). Moreover, one has to add to these categories the "personal expenses" that are not subject to the spending limit. In the online Appendix Section A.1, we provide a detailed definition of these different categories and present examples.

Figure 2 shows the relative importance of the different categories, and its evolution over time. While expenses on printing and advertising have always been the main spending item, their importance has been increasing since Word War II in relative terms. On the contrary,

[18] Limbocker and You (2018) offer a very detailed analysis on all types of campaign expenditures in the US between 2004 and 2014. However, they do not examine the relative efficiency of the different expenditure categories.

some items that were characteristics of the way campaigns worked before WWII have nearly disappeared, in particular expenses on agents and on clerks – the latter being drastically reduced by the free postage delivery granted by the *RPA 1918*.

[Figure 2 about here.]

There is no data on candidates' expense categories for the 2005 elections. Since the 2010 elections, the expenses categories are slightly different, in particular with the distinction between spending on advertising (including advertising on the Internet) and spending on unsolicited material (such as letters or leaflets). Online Appendix Figure A1 shows the distribution of spending for recent years depending on the political parties. Interestingly, the UKIP spends less on unsolicited material (such as letters or leaflets) but more on advertising (including street banners and websites) than the other parties.

**Campaign spending and votes: raw correlation** Because different candidates are willing to spend different amounts – and can, inasmuch as they respect the spending limit – the focus of this article is on the impact of differences in spending on the probability of being elected. Figure 3 shows the "raw" relationship between the proportions of total spending and total votes received by candidate by constituency, depending on the time period (and the associated campaigning technologies).

The correlation is positive for all the elections under consideration and the relationship seems to be well approximated by a straight line. This finding is consistent with the results of Ferguson et al. (2016) in the US and Bekkouche and Cagé (2018) in France. However, it is interesting to note that the relationship between expenses and vote shares evolves through time. In particular, the slope of the relationship appears to be significantly higher for the elections before the introduction of the Internet than for recent tears (a result to which we will return below).

[Figure 3 about here.]

### 3.3 Candidates' characteristics

As highlighted above, our dataset includes information on $32,025$ unique candidates. For each of these candidates, we have determined a number of key characteristics. First, using their first name, we have identify their sex. Out of the $32,025$ candidates, 86% are males. The share of female candidates has increased over time, however. In the online Appendix Figure C4, we plot the share of male candidates running, as well as the share of males among candidates who run for the first time: the latter has decreased from 100% in 1885 to 73% in

2015. We also collect information on whether the candidate is the incumbent, and on whether she previously ran in the same district.

Moreover, also using their reported name, we investigate whether the candidates have a nobility courtesy title (e.g. Baron, Viscount, Marquis etc.)[19], a civilian courtesy title (e.g. Commander of the Order of the British Empire), as well as a grade in the army (e.g. Lieutenant, Captain, Major, etc.).[20] Moreover, some candidates are ministers of a religion (e.g. Reverend). Not surprisingly, the share of the candidates with a nobility title has decreased over time (online Appendix Figure C5). The share of the candidates with a civilian honor as increased between 1885 and 1922 and has continuously declined since then. On the contrary, the share of the candidates with a grade in the army has been growing until the mid-20th century, with a peak following WWII. It has been decreasing since then. Finally, the ministers of a religion has never represented but a very small share of the candidates.

For each of the candidates running, we also collect information regarding their political party. While this may sound an easy information to obtain, it turns out not to be the case in the UK context where, until 1969, candidates were not allowed to state the name of their party on the ballot paper (Johnston and Pattie, 2014).[21] Hence this information is also not reported in the UK's "election expenses" reports, and in order to obtain to obtain it, we merge our expenses dataset using the name of the candidates, their electoral districts and the score they obtain with Ball and Smith (2016) who provide information on the election results, including the political party of the candidates.[22] Online Appendix Figure C6 reports the share of the candidates with a title separately for the Conservative, the Liberal and the Labour Party. Even if declining over time, the Conservative party consistently presents more candidates with a title than the other parties.

All these candidates' characteristics(gender, incumbency status, titles, political parties, etc.) are included as controls in our empirical analysis. Table 3 presents summary statistics.

[Table 3 about here.]

**Candidates' biographies** Furthermore, we build a completely new dataset on the background of the candidates using *The Times Guide to the House of Commons*, a paper format

[19]These titles mostly denominate heirs of peerages of a higher rank – their parent being of course forbidden to run for the House of Commons, but allowed in the House of Lords instead.

[20]Note that some candidates acquire their title between two elections, or obtain a new title. E.g. John Robert Pretyman Newman was a captain when he unsuccessfully run for the first time in 1906 as a Conservative candidate. He then became Lieutenant-Colonel.

[21]This was modified by the Representation of the People Act 1969. Moreover, new rules were introduced regarding the ballot paper format – in particular the possibility of including the party logo – with the Representation of the People Act 1983.

[22]Moreover, doing so allows us to cross-check our voting results data and correct a number of small mistakes found in (both) datasets. Online Appendix Figure C3 plots the vote shares obtained at the national level by the different parties at the General Elections since 1885.

repertory of all the candidates that we digitize for all historical years.[23] Since 1880, in the year following each General Election, *The Times* has indeed published a guide providing biographical details on every elected members of the House and, since 1929, on every unsuccessful candidates. These detailed data include the date of birth of the candidates, the high school and university they attend (if they do), their past occupations and public offices held, including committee and cabinets positions.[24]. Such data are extremely rare – especially for long-time series (see e.g. Dal Bó et al., 2017; Dal Bó and Finan, 2018).

Figure 4 presents summary statistics for the different candidate characteristics, including their age (sub-figure 4a), the share of candidates with a university degree (sub-figure 4b), the share of candidates who graduated from Oxford or Cambridge (sub-figure 4c), and the share of white-collar workers (sub-figure 4d). For each of these variables, we present the information separately for all the candidates and for the elected candidates.

[Figure 4 about here.]

### 3.4 Constituency-level controls

Finally, we build a dataset of constituency-level controls based on several sources. We first control for the electoral characteristics of the constituency: the number of candidates running in the constituency, the number of consecutive elections won by the incumbent party – in order to capture the marginality of a seat –, the victory margin at the last election, the total population, the number of registered voters, the total spending per registered voters, and turnout. Table 4 presents summary statistics

[Table 4 about here.]

Second, we construct a set of socio-demographic controls at the constituency level using census data. Censuses were conducted in the UK every 10 years since 1801 (to the exception of 1941); we apply interpolation to obtain election-years values. The type and aggregation of the data collected in the censuses varied over time, hence our controls differ depending on the time period under consideration. The remaining of the Section briefly describe the different controls included in each time period; more details and summary statistics are provided in the online Appendix.

At the constituency level, pre-WWI censuses of the period only display total population. Besides, the censuses also contain detailed occupational data at the *administrative county*

[23] Data for 2015 were provided to us by Jennifer vanHeerde-Hudson and Rosie Campbell (Lamprinakou et al., 2016).

[24] Online Appendix Figure C7 provides an example of the format of the data.

level.[25] It allows us to compute the share of population employed overall and in 27 different professional categories (see the full list of categories in the online Appendix).

The inter-war censuses data at the constituency level are also limited to population counts. However, censors added data on the composition of constituencies in terms of smaller units (local government areas), for which occupational data exists, together with tables describing the composition of constituencies in terms of these units. Hence, with a careful work of mapping [26], we compute the population shares by occupation at the level of the constituency.

From 1961 onward, censuses started to include richer socio-economic data, in particular information on where individuals are born and whether they recently moved in or out of the constituency. We also compute housing data such as the average number of rooms per households and their ownership status. Finally, instead of the previous occupational categories, which were judged obsolete, we extract newly defined socio-professional classes (from managerial to low-skill manual work), and occupations regrouped in sectors.

Finally, since 1974, in addition to the previously described data, we collect more detailed demographic (such as age classes) and employment data; as well as data on religious affiliation and educational levels. When estimating the overall effect of campaign spending on votes over the whole period, we introduce a reduced set of district-level controls that allow us to use all the electoral years. We enrich our set of controls – depending on data availability – when performing the estimation at the period level.

# 4 The long-term relationship between campaign spending and votes

In this section, we document the relationship between campaign spending and votes, and its evolution over time.

## 4.1 Empirical strategy

To estimate the impact of campaign spending on votes, we rely on the literature on discrete choice models (see e.g. Alvarez and Nagler, 1998, in a multiparty elections setting), and use an extended version of the Conditional Logit model that can accommodate the characteristics of the choices available to the voter.[27]

More precisely, for a choice among $c = 1, ..., C$ candidates $C_c$ with observed characteristic $X_{ic}$ (e.g. their campaign expenditures) and unobserved characteristics $\epsilon_{ic}$, we presume that

[25] At the time, there were 62 administrative counties in England and Wales, each comprising between 2 (Brecon) and 128 (London) constituencies.

[26] In this regard, we built on the work of Ball and Smith (2016), which we extended.

[27] In our context, it would be incorrect to simply estimate the impact of expenses on candidates' vote shares given that, within a district, candidates' vote shares are interdependent. See Bekkouche and Cagé (2018) for a detailed discussion.

the utility of an individual $i$ choosing the candidate $c$ is $U_{ic} = \beta X_{ic} + \epsilon_{ic}$. If we assume that $\epsilon_{ic}$ follows a type-I extreme value distribution uncorrelated across choices and individuals[28], and that the voters vote for the candidates who provide them with the highest utility, the probability that individual $i$ chooses candidate $c$ is given by:

$$P_{ic} = \frac{exp(\beta X_{ic})}{\sum_k exp(\beta X_{ik})}$$

In non-compulsory voting systems, individuals always have an "outside option" $P_{i0}$, which is to abstain. Assuming that $X_0 = 0$ (in particular, there is no campaign spending on abstention), the log-ratio of the probability that elector i votes for candidate c on i's probability of abstaining is given by:

$$\ln(P_{ic}) - \ln(P_{i0}) = \beta X_{ic}$$

Given only aggregate data is available (there is no information on the voting choice of each of the individual voters), the idea, in the spirit of Berry et al. (1995), is to approximate this probability with the proportions associated with each choice, i.e. in our context the number of votes obtained by each candidate $c$, $s_c$, so that:

$$\ln(s_c) - \ln(s_0) = \beta X_c$$

Hence, we can estimate the following empirical model:

$$\ln\left(\frac{s_{cmt}}{s_{0mt}}\right) = \alpha + \beta \text{spending}_{cmt} + \mathbf{X_{mt}}\gamma + \mathbf{Y_{ct}}\delta + \mathbf{Z_c}\theta + \zeta_m + \omega_{jt} + \epsilon_{cjmt} \quad (1)$$

where $c$ indexes the candidates, $j$ the political parties, $t$ the electoral years, and $m$ the electoral constituencies. Our left-hand side variable, $\ln\left(\frac{s_{cmt}}{s_{0mt}}\right)$, is the log of the ratio of the number of votes obtained by candidate $c$ in district $m$ in election $t$ over the abstention in district $m$ in election $t$. Our main explanatory variable, $\text{spending}_{cmt}$, is the share of the district $m$ total spending represented by the candidate $c$ in electoral year $t$ (alternatively, we use the absolute candidate spending). $\mathbf{X_{mt}}$ is a vector that includes all the previously described constituency-level covariates, $\mathbf{Y_{ct}}$ a vector that includes the the time-varying candidates' characteristics, and $\mathbf{Z_c}$ a vector that includes the constant candidates' characteristics (such as sex). All the specifications include party-election $\omega_{jt}$ fixed effects (in order to control for the electoral "popularity" of the candidates' political party on a given electoral year). This specification

[28] In other words, we assume that, at the individual level, the odds ratio for any two alternatives is independent of the probability of choosing the other alternatives (Independence of Irrelevant Alternatives, or IIA, assumption). This may be potentially problematic in the electoral context where strategic voting may be at play. We relax this assumption in the online Appendix where we show that our results are robust to using a multivariate logistic transformation with seemingly unrelated regressions.

also includes fixed effects at the constituency level, $\zeta_m$, and clusters standard errors at the same level.[29]

Furthermore, in our most conservative specifications, we focus on candidates who run multiples times and control for candidate fixed effects. The identifying assumption here is that the candidates' quality is constant over time conditionally on the electoral "popularity" of their political party in a given year and the time-varying candidates' characteristics $\mathbf{Y_{ct}}$ that we observe. Our empirical specification is then:

$$ln\left(\frac{s_{cmt}}{s_{0mt}}\right) = \alpha + \beta \text{ spending}_{cmt} + \mathbf{X_{mt}}\gamma + \mathbf{Y_{ct}}\delta + \xi_c + \omega_{jt} + \epsilon_{cjmt} \quad (2)$$

where $\xi_c$ indicate the candidate fixed effects. The main caveat of this specification is that in this case we have to limit our sample of analysis to those candidates who run multiple times, and that these candidates can be considered as a selected set of candidates.

Finally, when we investigate the change of the relationship between spending and votes over time, we add an interaction term between the share of spending and the election fixed effects:

$$ln\left(\frac{s_{cmt}}{s_{0mt}}\right) = \alpha + \beta \text{ spending}_{cmt} + \sum_t \beta_t \text{ spending}_{cmt}\phi_t + \mathbf{X_{mt}}\gamma + \mathbf{Y_{ct}}\delta + \xi_c + \omega_{jt} + \epsilon_{cjmt} \quad (3)$$

### 4.2 A positive correlation between spending and votes

**Average effect** In this section, we first present the results of the estimation of equations (1) and (2). We begin by estimating these models over our entire time period (1885-2017). Table 5 presents the results. Columns (1) and (2) include all the candidates. Columns (3) and (4) only consider the candidates who have run multiples times, and in Column (4) we control for candidates fixed effects. Overall, we obtain a positive correlation between the share of the total district spending represented by a candidate and the share of the votes she obtained. According to our estimates, a one-percentage point increase in the spending share leads to a 2 to 2.8% increase in the votes-on-abstention when we control for constituency, election, party, and party interacted with election fixed effects (Columns (1) to (3)).

The effect is robust to controlling for candidate fixed effects but, when we do so, the magnitude of the effect is halved: a one-percentage point increase in the spending share

[29] A challenge in that respect arises as, over the whole period, constituencies were frequently redrawn. For the post-1950 period, we were able, using historical sources (in particular the *BBC/ITV Guides to the New Parliamentary Constituencies*), to link constituencies across redistricting, and control whether they experienced significant changes or not. However, the scope of the 1918 and 1948 boundary reviews, as well as the lack of data around them, mean we have to assume all 1918 and 1950 constituencies were "new" ones. Therefore, our number of unique constituencies (hence clusters) is 2,053, around three times more than their average number by election (650).

is associated with 1.1% increase in the votes-on-abstention (Column (4)). It means that candidates' unobserved heterogeneity plays an important role in the relationship between spending and votes. Our empirical specification here allows us to capture the part of the heterogeneity that is constant over time.

The magnitude of the estimated effect is economically significant. On average, the total spending in an electoral district amounts to €68,478. Hence, a one-percentage point increase in the spending share of a candidate corresponds on average to an additional €685 in campaign spending. If we consider our most conservative estimate (Column (4)), such an increase leads to a 1.2% rise in votes-on-abstention. Holding abstention constant (i.e. assuming the changes in votes comes solely from other candidates' voters), this corresponds on average to 134 additional votes[30]. In other words, the price of a vote may be estimated to around €5.1.

[Table 5 about here.]

This result is robust to using the absolute spending (per voter) rather than the share of total spending represented by each candidate as the main explanatory variable of interest (online Appendix Table B5).

**Change over time and space** To investigate the evolution of the relationship between campaign spending and votes over time, we plot in Figure 5 our main estimates interacted with time fixed effects (see equation (3) above). Volatile, relatively low, and at times non-statistically significant in the pre-WWI period, the effect of spending seems to stabilize between 1922 and the early 1970's. It then surges to heights at the end of the century, and goes back to lower levels in the early XXIth century.

[Figure 5 about here.]

Alternatively, to estimate the evolution of the relationship between spending and votes and also control for a richer set of district-level covariates, in the online Appendix Table B4, we estimate equations (1) and (2) separately for five different time periods that broadly coincide with the introduction of the different campaign technologies described in Section 2 above. With or without controlling for candidate fixed effects, we obtain a positive and statistically significant correlation between spending and votes in all the time periods. The observed changes in the magnitude of the coefficients are consistent with the relationship plotted in Figure 5.

Interestingly, this time trend seems to be coupled with geographical divergences, as observed on 6. For each time period, the spending coefficients are plotted depending on the

[30]The average number of votes received by a candidate is 11,055.

region. While relatively homogeneous in magnitude across the country at first, the gap between regions widens over time, to reach a point where, in early the XXIth century, spending is 5 times more correlated with electoral results in the South West than in the North East region. We explain these striking temporal and spatial patterns in Section 4.3 below.

[Figure 6 about here.]

**Heterogeneity depending on the expenses categories** Before doing so, we investigate whether the correlation between campaign spending and votes varies depending on the expenses categories. For instance, are expenses on public meetings more efficient at switching votes than printing expenses (e.g. posters)? To answer this question, we look at the impact of the share of a candidate's spending on one expense category (e.g. printing) over the total spending on this category in the constituency.[31] In other words, we re-estimate equation (2), but our main explanatory variable of interest is now $\sum_e \beta_e \text{spending}_{ecmt}$, where $e$ index the different expense categories, and $\text{spending}_{ecmt}$ is the share of the district $m$ total spending represented by the candidate $c$ in electoral year $t$ on expense categories $e$.

Table 6 presents the results for the 1885-2015 time period. All the specifications include candidate fixed effects. In Columns (1) to (6) we consider the effect of each of the spending categories independently, and Column (7) includes all the categories simultaneously. We find that the positive relationship between spending and votes seems to be mainly driven by the "printing and advertising" spending category.

[Table 6 about here.]

This is further strengthened when looking at the effect across time that are plotted in Figure 7: the time pattern observed in Figure 5 is most (only) visible for the "printing and advertising" category; only in the interwar period are the other categories – "meetings" in particular – comparable in terms of magnitude.

[Figure 7 about here.]

## 4.3 Explaining the patterns of the evolution in the impact of spending

How to explain the change over time in the impact of spending on votes? We consider three potential explanations: the level of spending limits; the intensity of electoral competition; and the introduction of new campaign technologies.

[31] Given that the expense categorization was changed in the 2000's, we only perform this analysis for the the 1885-2001 period.

### 4.3.1 Spending limits

Fouirnaies (2018) shows that, in the UK, spending limits are positively correlated with the average amount spent by candidates. Given that we found decreasing returns to scale for total spending, a change in the spending limits could directly affect the magnitude of our estimated effects. This is indeed what we find in Table 7 where we interact the share of spending with the spending limit per voter in the constituency: the estimated coefficient associated with this interaction is negative.

[Table 7 about here.]

However, as shown in the online Appendix Figure A2 and discussed in Section 2, spending limits have been extremely stable in real terms since 1970. Hence, while they should be considered when looking at the impact of campaigns, they are an unlikely candidate for explaining our findings regarding the last quarter of the twentieth century, that appears as the golden age of campaigning. Similarly, they cannot be the factor behind the observed drop in the efficiency of spending since the introduction of the Internet.

### 4.3.2 Electoral Competition

**Partisanship** One dimension of the electoral environment that could have affected the impact of spending on votes is partisanship. The strength of voters' preference towards their chosen party has indeed been shown to interact with polarization (Ezrow et al., 2014) and incumbency importance (Eggers and Spirling, 2017). One way to measure the strength of partisanship is to use the self-reported degrees of party identification. Since 1963, the British Election Survey (BES) has included questions on individuals' party affiliation and its strength – i.e. whether individuals identify themselves *"very strongly"*, *"fairly strongly"*, or *"not very strongly*" with the party.

In the online Appendix Figure B1, we show that the strength of party identification has drastically decreased over the years, in particular since 1974. It thus makes it an interesting factor that could potentially explain the increase in the strength of the relationship between spending and votes during this period. However, in the online Appendix Table B8, interaction estimates suggest that the strength of partisanship does not affect the relationship between spending and votes.

**Election closeness** Another, more direct, measure of electoral competition in majoritarian systems is the marginality of a seat, i.e. the level of perceived certainty the seat will be won by a certain party/candidate. At the constituency level, marginality is often measured by the votes margin between the two main contenders – the lower the margin, the "closer" the election, the more uncertain the outcome – taken either in opinion polls or, more often, from

previous elections results in the same constituency (the margin at time t being of course highly endogenous to the analysis). While the impact of closeness on turnout is still debated (see Bursztyn et al., 2017), closeness is acknowledged to directly impact the behaviors and strategies of candidates (Cann and Cole, 2011; Gerber et al., 2017), and the impact of campaign spending (Gerber, 2004).

Table 8 reports the results of our estimations when we interact the share of spending with the winner votes-margin at the previous election. We focus on the post-war period. We find that the interaction between spending and election closeness is negative and significant. Hence, the closer the elections, the more efficient campaign spending seems to be.

[Table 8 about here.]

Interestingly, looking at the patterns of marginality over time, one observes from Figure 8 a sudden drop in the average votes margin in 1974 – and an increase in 2001. In other words, changes in the strength of the electoral competition can help to rationalize the evolution in the impact of spending we observe over time.

[Figure 8 about here.]

#### 4.3.3 Candidates Characteristics

Aside from on *what* it is spent and in *which environment*, the relation between election expenses and electoral results could also depend on *who* spends them - i.e. on the candidates themselves. In section 3.3, we have seen that their characteristics have significantly changed over time. In particular, the average age of candidates has jumped in 2001 from 46 to 52 years old. Estimates of Table 9 suggest that age is negatively correlated with the efficiency of spending: part of the latter's fall in the 2000's might thus be explained by a change in the composition of the candidates' pool.

[Table 9 about here.]

## 5 Shedding light on the causal effect of spending on votes

Until now, we have documented a positive and statistically significant relationship between campaign spending and votes. But is this relationship causal? As a matter of fact, our estimates may suffer from the endogeneity of campaign spending with respect to votes, with a bias that can go in both directions. On the one hand, we might have over-estimated the impact of spending given that more popular candidates are likely to receive higher levels of financial

contributions – and therefore have higher campaign expenditures.[32] Similarly, overestimation can come from the fact that campaign spending positively correlates with other forms of local campaigning – in particular, campaign work by volunteers (e.g. canvassing, leaflets distribution etc.) (Pattie et al., 1994; Denver and Hands, 1997) – which themselves positively impact the results.[33] On the other hand, our estimates could be underestimated if campaign spending was over-proportionally used by (financially well-off) candidates having a hard time, to compensate for their lack or loss of popularity.

In this section, we propose two new IV strategies, based on events of British History that led to exogenous variation in campaign spending, to get rid of endogeneity. Our results suggest a causal effect of spending on votes.

## 5.1 IV Strategy

### 5.1.1 Trade Union political funding

Our first instrumentation strategy is based on changes in the regulation of the Trade Union's political funding. As discussed previously, Trade Unions have played a key role in the foundation of the Labour Representation Committee (then Labour Party) in 1900. At the time, all union members were paying a levy for political purpose, part of which was directly paid to the Labour Party as affiliation fees accounting for on average 60-80% of its total income.[34] Over the century, and until the so-called "New Labour" turn of the 90's, the Labour Party has relied extensively on Trade Unions' funding, to the extend that it became the target of legislative pressures from the other parties – first of all the Conservatives. Two times, in 1908 and 1927, these attacks led to reforms that significantly reduced unions political funding; and each time, they were overturned by later governments, in 1913 and in 1945. It is these four shocks that we intend to use in our identification.

In 1908, a Liberal union member, W. Osborne, formally complained against the compulsory nature of the levy. Seizing the opportunity, the House of Lords and the Court of Appeal both judged that since the definition of unions' object under the *Trade Union Act 1871* made no clear mention of political action, their political funding was illegal (Gwyn, 1962) – this has been known as the *Osborne Judgement*, pronounced in December 1909. Progressively then, injunctions on Unions decreased Labour Party affiliation fees, which fell by 25% over the sole

[32] This relates to the difficulty to observe certain traits of candidates: while our empirical specifications capture, through candidate fixed-effects and biographical accounts, all their time-invariant characteristics and some of their time-varying ones, time-varying dimensions such as charisma or popularity can remain. Besides, bias can also also come from dynamic positive feedback loop between fundraising and electoral success (Feigenbaum and Shelton, 2013).

[33] Trying to disentangle between the two dimensions, Johnston and Pattie (1998) find however that both are likely to impact elections' results.

[34] In fact, until 1918, no individual member outside those affiliated to Trade Unions were actually allowed in the Party.

year of 1910. A major threat to the very existence of the Labour Party, the judgment was overturned in the years that followed by the Liberal government, through the *Trade Union Act 1913*. Under the Act, Unions had to conduct a secret ballot to determine whether they wanted to adopt a political object. If a majority of members voted for, a special fund was created within the Union, to which members could freely decide to contribute or not, but the default position was "in" – i.e. the members would automatically contribute unless they explicitly specified not wanting to do so (Ewing, 1987).[35] In other words, the system introduced was an "opt-out" or "contracting-out" system.

Following large strikes in 1925-1926, the Parliament voted the Trade Union Act 1927 to diminish the power of the Trade Unions.[36] Section 4 of the Act mandated Trade Union members to contract-in (opt-in) to any political levy which their union made on their behalf – thereby replacing the "opt-out" system. As the result, participation rates in political funds declined, falling from more than 75% of the members of all unions affiliated to the Trades Union Congress in 1925 to 48% in 1938 (Ewing, 1987). One has to wait the landslide Labour victory in 1945 to see the opt-out system re-installed.

These reforms had important impacts on the finance of the Labour Party. We collected annual data on the Labour party's balance sheets (from the *Report of the annual conference of the Labour Party* that we digitized), which include information on the sources of the funding. We find that the Labour party's funding originating from the Trade Unions decreased by more than 40% between 1926 and 1929; between 1946 and 1947, affiliation fees from TUs to the Labour Party increased by more than 50%.

These figures refer to the situation of the Labour party at the national level, but Labour candidates were not benefiting from the Trade Unions funding homogeneously. In fact, for most of the century, the Labour party has operated a sponsoring system whereby each Labour-endorsed candidate was supported by either the Constituency Labour Party (CLP), the Co-operative Party (a small left-wing party in alliance with the Labour), or a Trade Union. The information on candidates' sponsorship can be found in the *Reports of the Labour Party Annual Conference* of the election years. While all Labour candidates might have suffered from the drop in TUs contribution, it seems reasonable to assume that those directly financed by the Unions suffered even more.

Therefore, our strategy is to instrument the variation in campaign spending of Labour candidates – between two elections spanning a reform – by their sponsorship status. We focus here on the 1927 reforms, using Labour candidates who ran both in 1924 and in 1929. Out of the 482 Labour party's candidates who ran in 1929, 201 (around 42%) were already present

[35] The fund could then contribute either to a party or to a specific campaign, to the discretion of the party leaders (members usually did not have a direct say).

[36] Perhaps surprisingly, this Act was supported by the Labour Party in 1927. The strategy of the Labour was indeed to appear less as as "the party of the Trade Unions" but more as the one of all the citizens.

in 1924. Out of these 201 candidates, 79 were sponsored by the Trade Unions in 1929, while 122 were not. Importantly for us, the sponsoring status hardly changed between 1924 and 1929. Out of the 79 candidates sponsored by a Trade Union in 1929, 76 were sponsored so in 1924; out of the 122 candidates who were not sponsored by Trade Union in 1929, only 5 were were so in 1924. For the sake of identification, we focus in our analysis on these 193 candidates whose sponsoring status did not change.

Our exclusion restriction is the following: conditionally on controls, the change in vote shares of the candidates should only be affected by their sponsorship status (and the political expenses of their sponsor) through the decrease in campaign spending. Our first stage identification equation is:

$$\Delta_{29-24}\text{Spending}_{cm} = \alpha + \theta_1 \text{Sponsored by Trade Unions}_c + \mathbf{\Delta_{29-24} X_m}\phi + \mathbf{\Delta_{29-24} Y_c}\psi + \omega_{cjm} \tag{4}$$

and our second stage:

$$\Delta_{29-24} \ln\left(\frac{s_{cm}}{s_{0m}}\right) = \alpha + \beta \Delta_{29-24}\widehat{\text{Spending}}_{cm} + \mathbf{\Delta_{29-24} X_m}\gamma + \mathbf{\Delta_{29-24} Y_c}\delta + \epsilon_{cjm} \tag{5}$$

where as before $c$ index the candidates and $m$ the electoral districts, $X_m$ is the vector of district-level controls and $Y_c$ is the vector of time varying candidate-level controls. $\Delta_{29-24}$ indicates the change in the values between the 1924 and the 1929 elections. Sponsored by Trade Unions$_c$ is an indicator variable equal to one if the candidate is sponsored by a Trade Union, and to zero otherwise.

One can be concerned that the Trade Union-sponsored candidates may differ significantly from the other Labour party candidates, both in their own characteristics and in the characteristics of the constituencies in which they run, in a way that would impact their change in vote shares and hence threaten our identification strategy. This would be the case especially if the two groups exhibited different trends in their popularity over time – our strategy being indeed akin to a Diff-in-Diff. Reassuringly, Figure 9 shows that, prior to 1929, the votes shares of both types of candidates, even if different in levels, followed very similar trends.

[Figure 9 about here.]

**Using Trade Unions' political expenses** Until now, we have used Union-sponsorship as a binary dimension, but it might be that Unions were affected heterogeneously by the reforms. Besides, a binary approach cannot rule out the possibility of external factors affecting the

general perceptions of Unions, and hence the popularity of their candidates. We thus go one step further by using direct information on Unions' political spending, which we collected from the Annual Reports of Unions' historical supervising body: the *Chief Registar of Friendly Societies*. These Reports display, each year, the total political expenditure of each Trade Unions' industrial *sectors* (Mining; Metals; Textile; Government; etc.) (see Figure C8 in the Online Appendix), and a list of which registered Trade Union belongs to which sector. We can therefore assume that, among sponsoring Unions, those experiencing the largest drop in political expenditure (at the sectoral level [37]) could be those decreasing the most their Labour candidates' funding – thereby strengthening our exclusion restriction assumption. In a second step, we thus change our first stage regression to:

$$\Delta_t \text{Spending}_{cm} = \eta + \theta_1 \text{UnionSponsored}_c + \theta_2 \text{UnionSponsored}_c * \Delta_t \text{PoliticalExp}_s + \mathbf{\Delta_t X_m}\phi + \mathbf{\Delta_t Y_c}\psi + \omega_{cjm} \quad (6)$$

### 5.1.2 Changes in spending limits

Our second instrument relies on exogenous changes in spending limits due to extension of the franchise – limits are indeed defined with respect to number of registered voters. We use the one induced by the 1969 Representation of the People Act, which, as documented in Section 2, lowered the voting age from 21 to 18 years old. This leads to a 3.5 million increase in total number of registered voters, simultaneously increasing the spending limit.

Our assumption here is that such an increase should only affect the candidates who were previously constrained by the limit (in absolute terms), as it indicates that they had the resources and willingness to spend more. This seems to be validated by Figure 11, which represents graphically the change in spending limits between 1966 and 1970 in each constituency, and the change in total expenses of the 1966 highest- and lowest-spending parties within these constituencies: while higher spenders, who were most often at the limit in 1966, clearly increased their spending following the increase in the limit, the correlation does not appear for the lower spenders. Our exclusion restriction here is that the effect of change in spending limit impacts vote share only through changes in spending, conditional on the controls. It seems unlikely indeed that the young voters would have a special preference to 1966 high-spending candidates (who come from all three main parties).

[37] Note that since sponsoring Unions were often the largest ones, the are likely to be the ones accounting for the largest share in sectoral political spending variations

$$\Delta_{70}\text{Spending}_{cm} =$$
$$\eta + \theta_1 \Delta_{70}\text{Limit}_m + \theta_2 \text{ShareLimitSpent}_{c,66} + \theta_3 \Delta_{70}\text{Limit}_m * \text{ShareLimitSpent}_{c,66} + \mathbf{\Delta_{70} X_m} \phi + \mathbf{\Delta_{70} Y_c} \psi + \omega_{cjm} \quad (7)$$

$$\Delta_{70} \ln \left( \frac{s_{cm}}{s_{0m}} \right) = \alpha + \beta \Delta_{70} \widehat{\text{Spending}}_{cm} + \mathbf{\Delta_{70} X_m} \gamma + \mathbf{\Delta_{70} Y_c} \delta + \epsilon_{cjm} \quad (8)$$

[Figure 10 about here.]

[Figure 11 about here.]

## 5.2 IV estimations

### 5.2.1 TU political funding

Table 10 presents the results of the estimation for the 1927 reform, which reduced Trade Unions political funds. The estimation is performed at the candidate level, focusing on Labour candidates who ran both in 1924 and in 1929 (hence the relatively small number of observations). The first four columns report the first stage estimates of the 2SLS regressions reported in the last 4 columns. As expected, being sponsored by a Trade Union in 1929 implied a lower change in total spending per elector between the 1924 and 1929 elections. This translated into a smaller change in vote shares (as the coefficient in columns (5) is positive and significant). This relation persists as we control for candidate- and constituency-level characteristics (Columns (2)-(3) and (6)-(7)) as well as for the vote share obtained by the party of the candidate in 1923 and its change between 1923 and 1924, to make sure there is no pre-trend (Column (4) and (8)). Online Appendix Table D12 show similar results when interacting Union-sponsorship with changes in Union political expenditures.

[Table 10 about here.]

### 5.2.2 Franchise extension

Table 11 presents the results of the estimation. The estimation is performed at the candidate level, focusing on the candidates who ran both in 1966 and 1970. In the first four columns, we report the first stage estimates, and in Columns (5) to (8) the second stage estimates where we instrument the change in candidate spending. In Columns (1) to (4), our main

explanatory variable of interest is the interaction between the change in the spending limit between 1966 and 1970 (which varies at the electoral district level) and the share of the limit spent in 1966 (which varies at the candidate level). As expected, we find that this interaction is positive and statistically significant: an increase in the spending limit between 1966 and 1970 increases the amount spent by the candidates in 1970, but only for those candidates who were constrained by the limit in 1966. This is robust to controlling for candidate-level characteristics and district-level controls (Columns (2) and (3)) as well as for the vote share obtained by the party of the candidate in 1964, to make sure there is no pre-trend (Column (4)).

If we now turn to the impact of spending on votes, we find that the instrumented change in candidate spending has a positive and statistically significant effect on the change in the vote share obtained by the candidate (Columns (5) to (8)). In other words, our results do not seem to be driven by the endogenous nature of campaign spending.

[Table 11 about here.]

#### 5.2.3 Direction of the bias

To investigate the direction of the bias implied by the endogeneity of spending, in the online Appendix Tables B9 and B10, we estimate the effect of the change in spending limits on the change in candidates' vote shares in the exact same specification as the 2SLS regressions presented above, but without instrumenting for spending. We find that the magnitude of the IV estimates is on average sligthly more than two times as high as the magnitude of the OLS estimates. Hence OLS *underestimates* the effect of spending. We understand this as candidates having a hard time spending large amounts to compensate. This may also be due to the fact that given in our estimations we control for a lot of candidates' observed characteristics, as well as in some specifications for candidate fixed effects, we in fact capture several possible overestimation biases – such as those related to candidates' "quality" – while we do not control for unobserved factors behind the underestimation bias.

Of course, the causal effect we point towards has to be considered carefully, given that our estimations take place at specific points of time (in the 1920's for the Trade Union political funding instrument, and the late 60's for the franchise extension one). On the contrary, the correlations between spending and votes we present in Section 4.2 are estimated using our entire time period (1885-2015). While it would be great to have an instrument that we could use for each of the elections in our sample, we unfortunately do not have one. We think nonetheless that the evidence we present in this section shows that the impact of spending on votes is not entirely driven by the endogeneity of spending. If anything, our OLS underestimates the effect of spending – a result obtained using two very different instruments

in different time periods and on a different subset of candidates – and could be therefore considered as lower bounds.

# 6 Discussion and External validity

## 6.1 Why does money matter?

In this article, we have shown that money plays a role in the electoral process: by increasing their electoral spending, candidates increase the number of votes they obtain on average. However, different campaigning technologies have different marginal returns in terms on votes. We have also shown that the impact of campaign spending on votes has increased over time. Why is it so? In this section, we discuss and test the different forces that may be at play.[38]

While a key explanation for campaign spending impact on electoral results is the provision of information about candidates to voters, it is likely not the only one (Herrera et al., 2008). First, spending can move party sympathizers to effectively vote – something usually called the "mobilization effect". Second, spending can help persuade undecided voters or voters leaning to the other party of the merits of one party's policies by providing information (see e.g. Baron, 1994; Coate, 2004; Prat, 2002a,b; Schultz, 2007). This is the "persuasion effect" of spending. Finally, campaign spending can be used to dissuade sympathizers of the other party from voting.

**Mobilization and turnout** In his literature review on the impact of campaign spending, Jacobson (2015) highlights that campaign spending can bring to the poll people who would not otherwise do so, but existing evidence is inconclusive: Ansolabehere et al. (1994), for instance, find that *negative* campaigning reduces voter turnout.

We can use our dataset to study this question on the long run by running the regression:

$$\text{turnout}_{mt} = \alpha + \beta \,\text{total spending}_{mt} + \mathbf{X'_{mt}}\boldsymbol{\kappa} + \lambda_m + \eta_t + \epsilon_{mt} \tag{9}$$

where as before $t$ indexes the election and $m$ the district. $\text{turnout}_{mt}$, the outcome of interest, is calculated as the total number of votes received by all candidates in constituency m at election t, divided by the number of registered voters. $\text{total spending}_{mt}$ is the total amount spent (per registered voter) by these candidates; or, in a second step, by each political party taken individually. The vector $\mathbf{X_{mt}}$ contains the same constituency-level controls as before. Standard errors are clustered at the constituency level.

Table 12 presents the results when spending by all the political parties is pulled together. Whether we consider the entire time period 1885-2017 (Columns (1) and (2)) or each of our

[38] For a review of the literature on how campaigns matter, see Jacobson (2015).

sub-time periods separately, we obtain a positive and statistically significant effect of total spending at the district level on turnout. The magnitude of the effect is the strongest in the 1974-1997 time period (7.3), when modern campaign technologies were introduced.

In the online Appendix Table 12 we report the standardize "beta" coefficients. We find that a one-standard deviation increase in total spending increases turnout by 0.38-0.39 percent of a standard deviation when we consider the entire time period. The increase is respectively of 0.37 and 0.31 percent of a standard deviation in 1885-1911 and 1922-1945. It is much lower in 1950-1970 and 2001-2017 (0.06). Finally, we show that a one-standard deviation increase in total spending increases turnout by 0.20 percent of a standard deviation in 1974-1997.

[Table 12 about here.]

In Table 13, we consider spending by each of the different political parties separately.[39] Interestingly, we show that while for the Conservative, the Liberal and the Labour parties, spending has a positive (and most often statistically significant) effect on turnout at the district level, the effect is negative and statistically significant for the UKIP party. In other words, spending by candidates from the UKIP party seems to reduce voter turnout, as does negative campaigning.

[Table 13 about here.]

**Persuasion** To disentangle between the persuasion and the information effects of spending, we rely on the fact that, as highlighted by Jacobson (2015), *"campaigns matter, but not for everyone"*. In particular, citizens vary in their susceptibility to persuasion by political campaigns. For instance, persuadable voters tend to be the least educated voters. Recent evidence from the U.S. documents that spending on messages to voters primarily affects people who are members of a political party, and people dissatisfied with the economy (Sprick Schuster, 2018).

To investigate whether the channel is persuasion, we estimate equation (1) separately for electoral districts that are above / below the median regarding the share of the population with higher education. Online Appendix Table B13 presents the result for the 2001-2015 time period. We find no statistically significant different between low-education and high-education district. If anything, the magnitude of the estimated effect is higher in high-education constituencies.

[39] See the online Appendix Table B15 for the standardized "beta" coefficients.

### 6.2 External validity

There is a lack of empirical information about the flow of money and its impact on politics outside the case of the United States.[40] Yet it is critical in this area to develop a broad comparative perspective in order to better understand and analyze the forces at play. Our paper focuses on the specific case of the UK; a key question is then to determine whether we should expect the patterns we have uncovered in this country to be repeated in other contexts.

A number of aspects of the British campaign finance regulation can also be found in other countries (see Cagé, 2018, for a review of the different regulations at play in Western democracies). First, the UK have limited campaign spending by law. This is the case of a number of other countries, such as Belgium, Brazil, Canada, Chile, France, Israel, New Zealand, and South Korea, among many others (Gunlicks, 1993; Nassmacher, 2009; Speck, 2013; Avis et al., 2017). Hence our findings could have important implications for these countries. Second, like in Germany, there is no limitation on the donations that can be made to the parties and candidates in the UK. Finally the UK, like the vast majority of the democracies around the globe, has a multiparty electoral system.

## 7 Conclusion

In this paper, we have provided the first estimation of the impact of campaign spending on votes over a very long period of time. While many argue that with the introduction of the Internet, it has become increasingly cheaper for candidates to enter the electoral races, we document on the contrary that while the effect of candidates' expenses on their results became stronger over the 20th century, it has decreased in recent years, a period corresponding to the introduction of the Internet. This finding may have consequences regarding the optimal campaign finance regulations in the Internet era.

Furthermore our results, based on the study of the effect of campaign spending over a period of time which covers important innovations in technologies, indicate that to understand the mechanisms at play behind the role of money in politics, it is important to consider the heterogeneity in the technologies used by the candidates. It is also important to take into account changes in the structure of the electorate. E.g., we show that the efficiency of campaigning varies depending on the closeness of the elections. We also find that the lower the spending limits, the higher the correlation between spending and votes. While the existing literature on campaign expenditures and votes has mostly focused on the US, a country where there is *de facto* no spending limit, analyzing this impact in the context of a country that has limited campaign spending by law sheds a new light on this debate.

[40] See Scarrow (2007) for a literature review.

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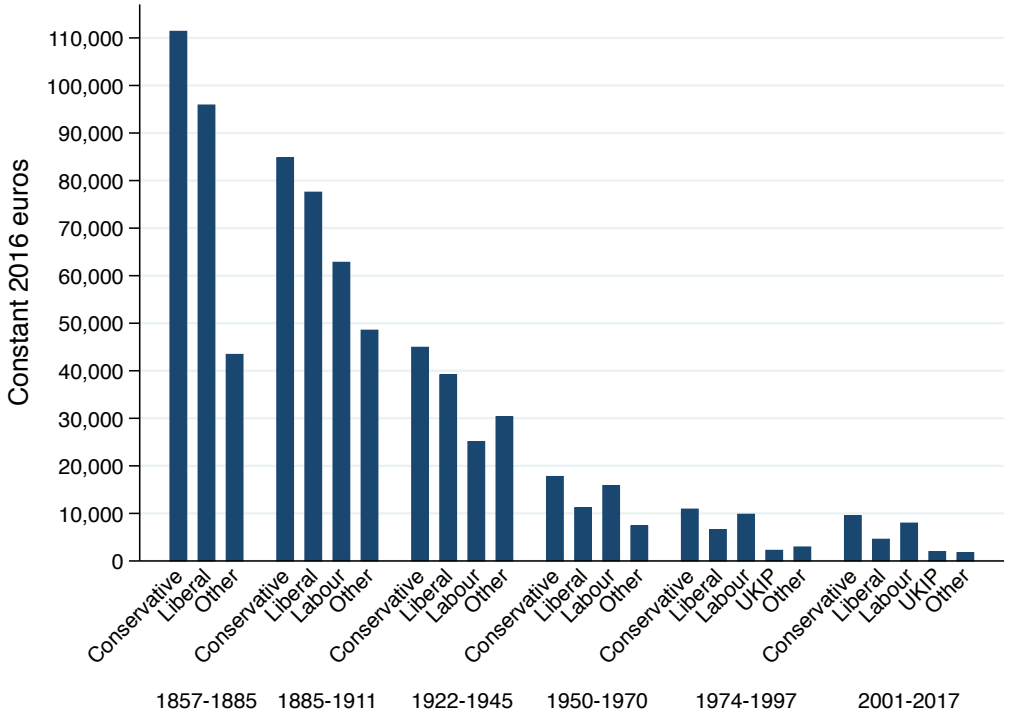
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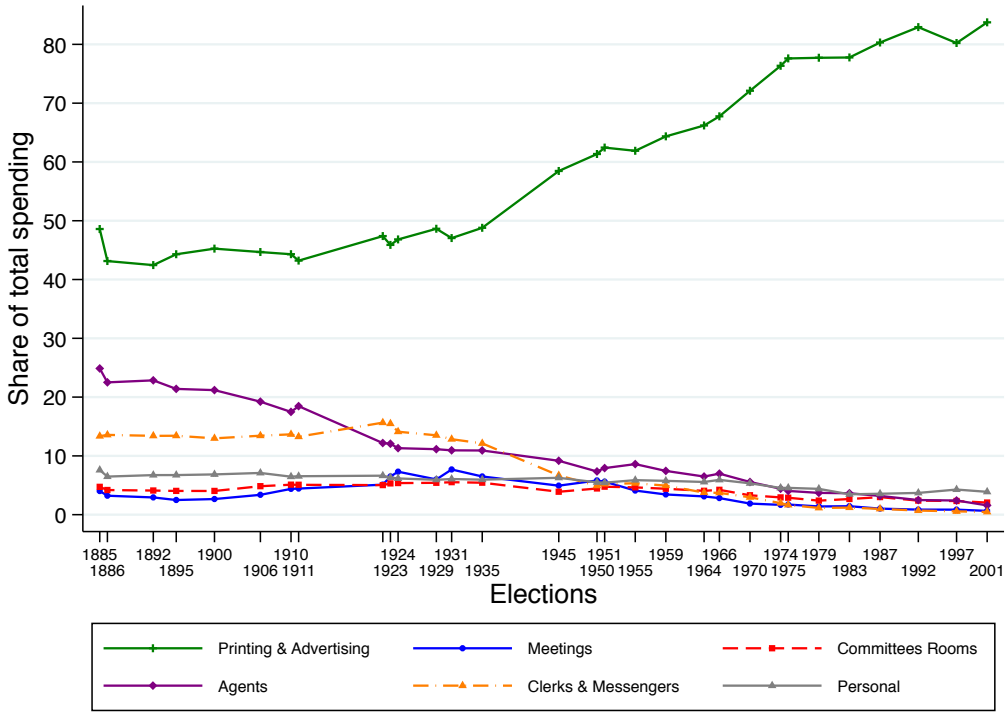
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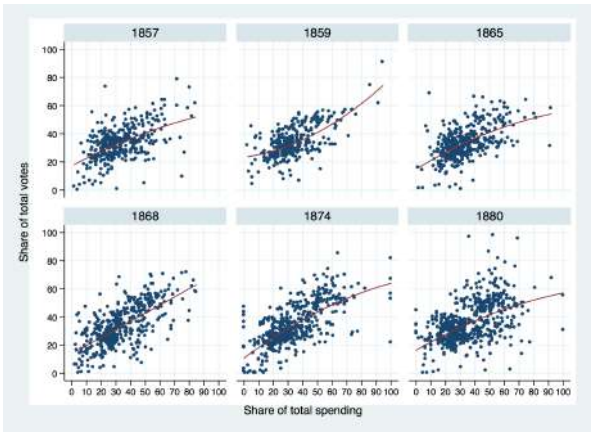

**Notes:** The figure plots the average total spending of the candidates, depending on the time period and on the political party to which they are affiliated.

Figure 1: Total spending of the candidates, depending on the time period and of their political party

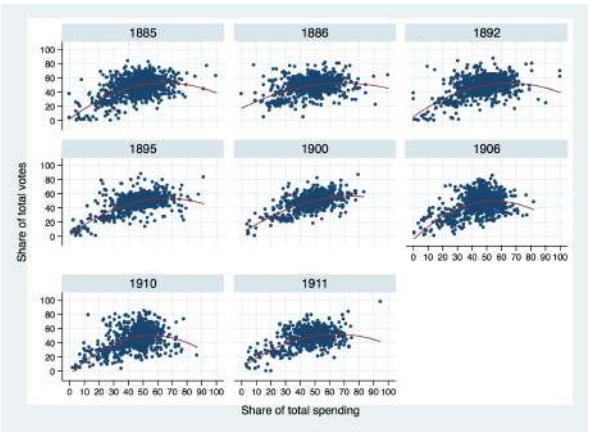



**Notes:** The figure plots the average share of candidates' total expenses spent on each expenses category, at every general elections over the 1885-2001 time period. The expenses categories are described in details in the text.

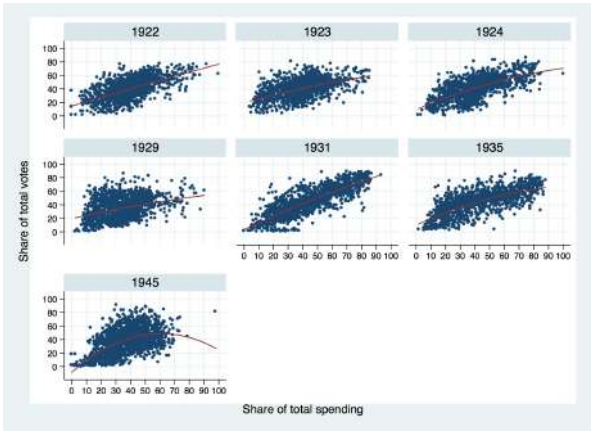
Figure 2: Electoral expenses by category over time, 1885-2001



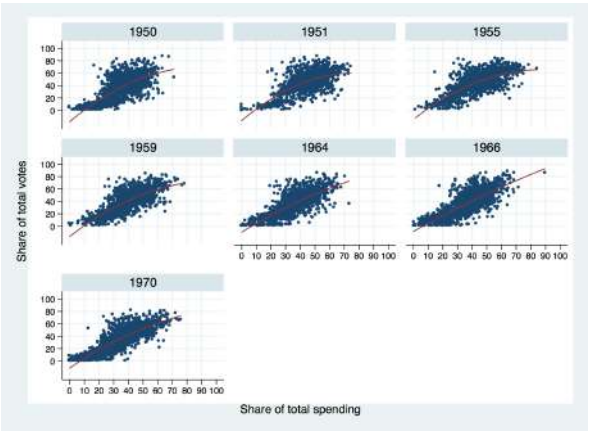

(a) 1857-1880



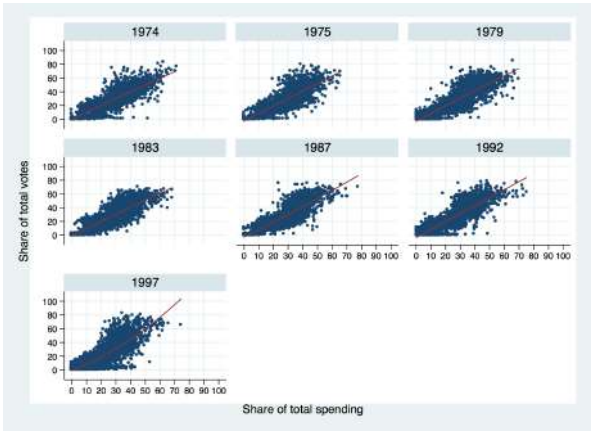

(b) 1885-1911



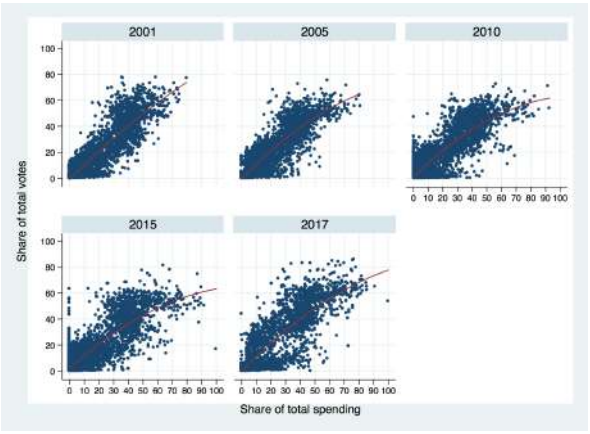

(c) 1922-1945




(d) 1950-1970



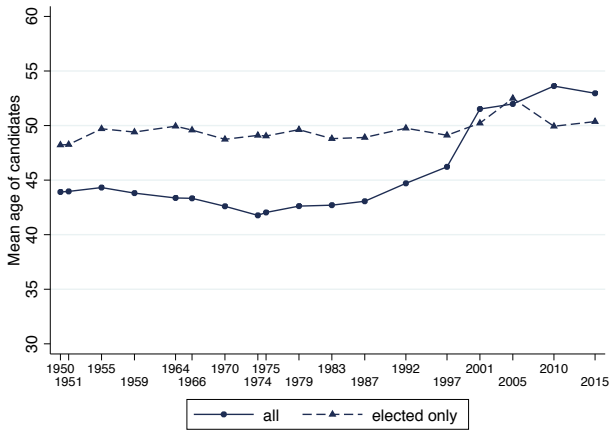

(e) 1974-1997



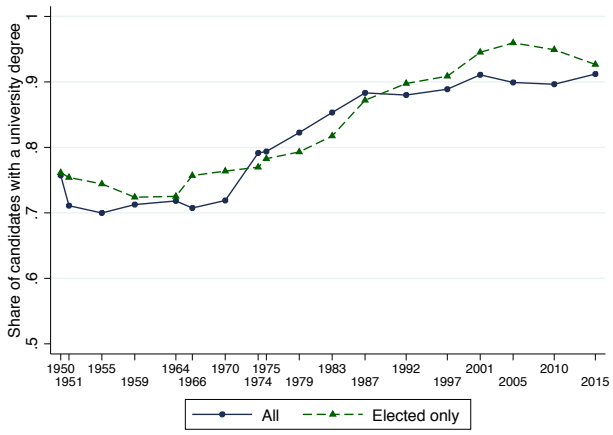

(f) 2001-2017

**Notes:** The figure plots the relationship between the proportions of total spending and total votes received by candidate by district, for the 1857-1880 elections (3a) for the 1885-1911 elections (3b), the 1922-1945 elections (3c), the 1950-1970 elections (3d), the 1974-1997 elections (3e) and the post-2001 elections (3f).

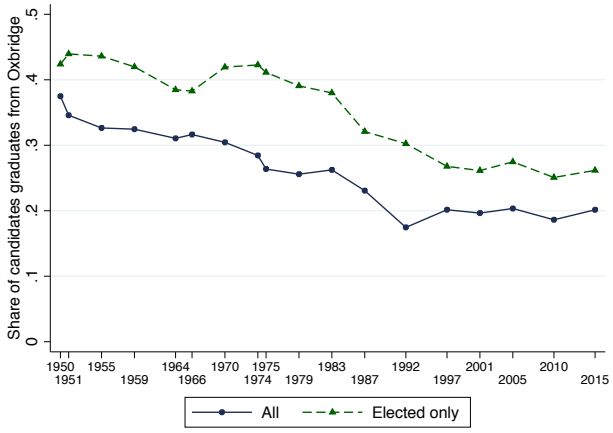
Figure 3: Relationship between the proportions of total spending and total votes, 1885-2017



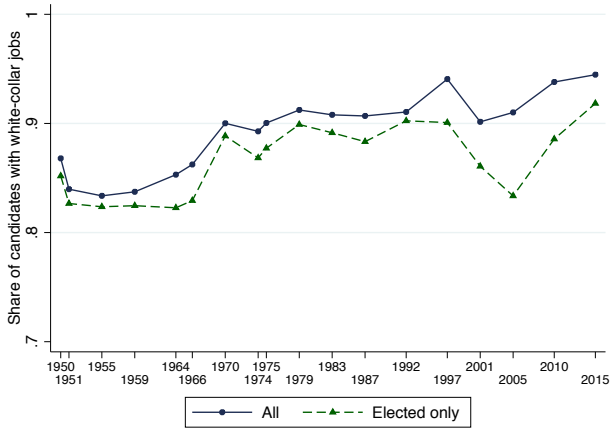

(a) Age




(b) University diploma



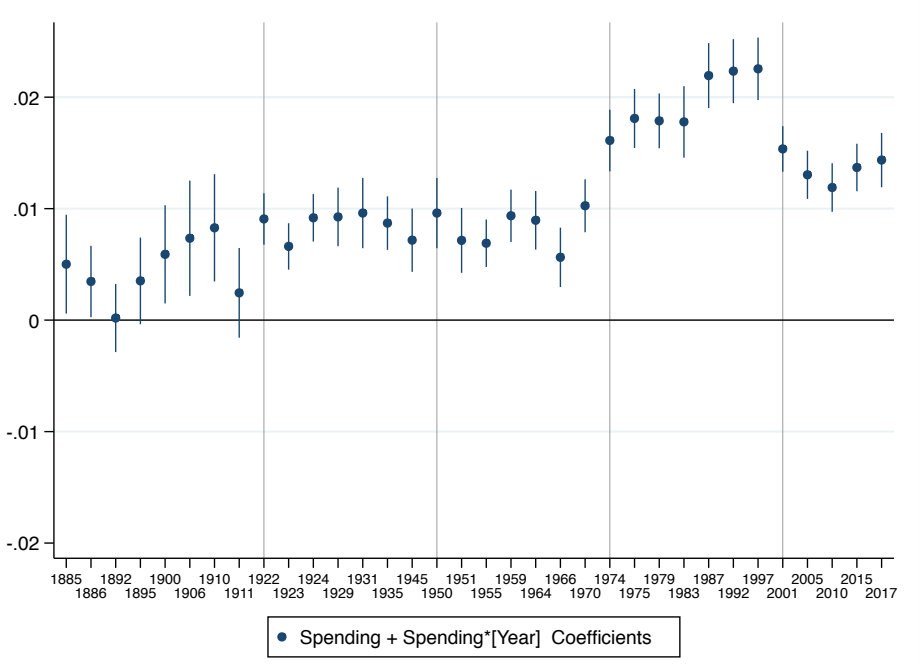

(c) Oxbridge




(d) Occupation

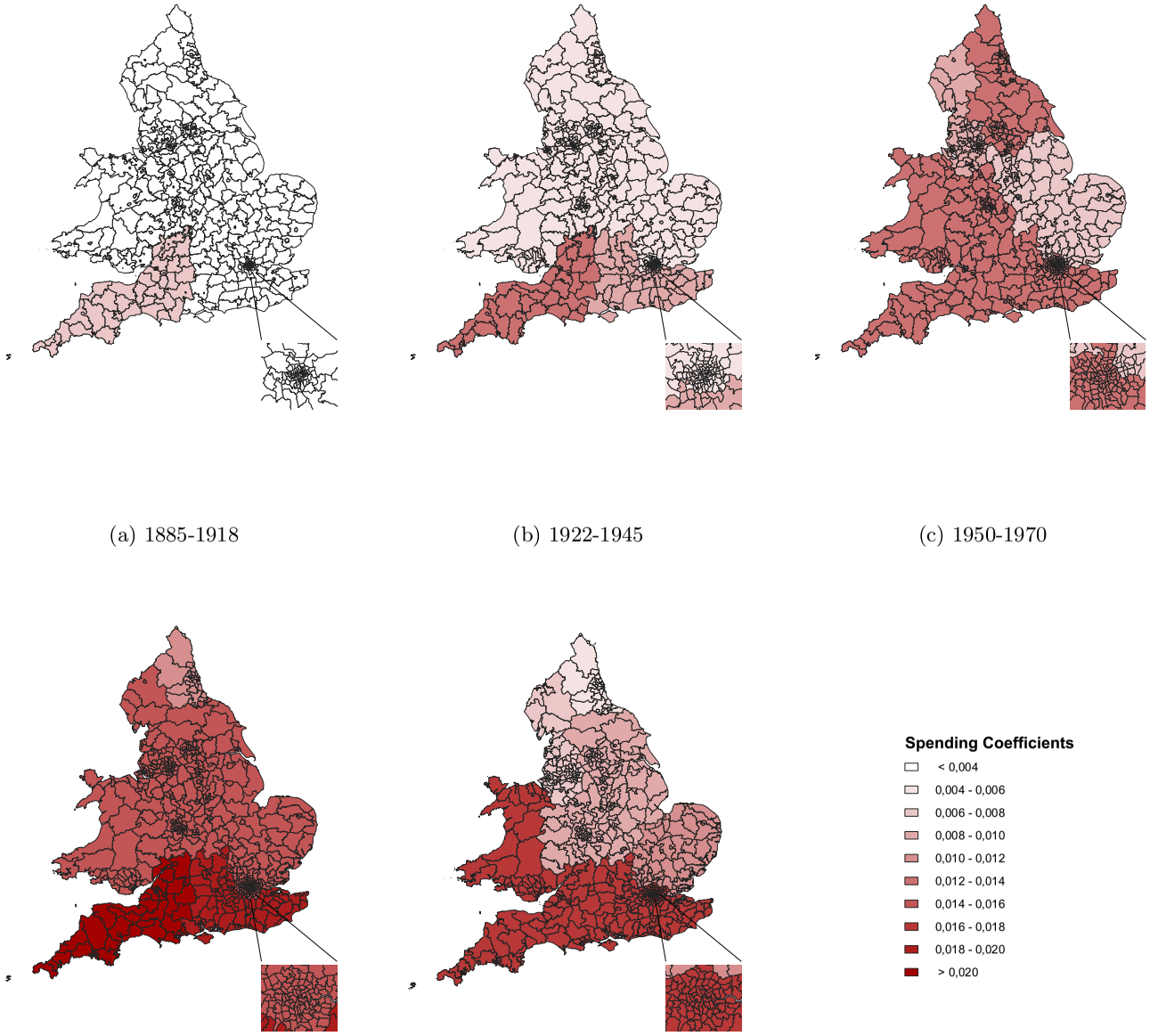
**Notes:** The figure plot summary statistics for all the candidates and for the elected candidates. Figure 4a report the average age of the candidates, Figure 4b the share of candidates with a university degree, Figure 4c the share of the candidates who graduated from Oxford or Cambridge, and Figure 4d the share of white-collar workers.

Figure 4: Candidates' biographies: Summary statistics




**Notes:** The figure plots, for each election year, the point estimates and 95% confidence intervals of the linear combination of the share of spending coefficient and its interaction with an election-year dummy (the coeficients $\beta + \rho$ in equation (3)).

Figure 5: Evolution of the relationship between candidates' share of total spending and vote share, 1885-2017

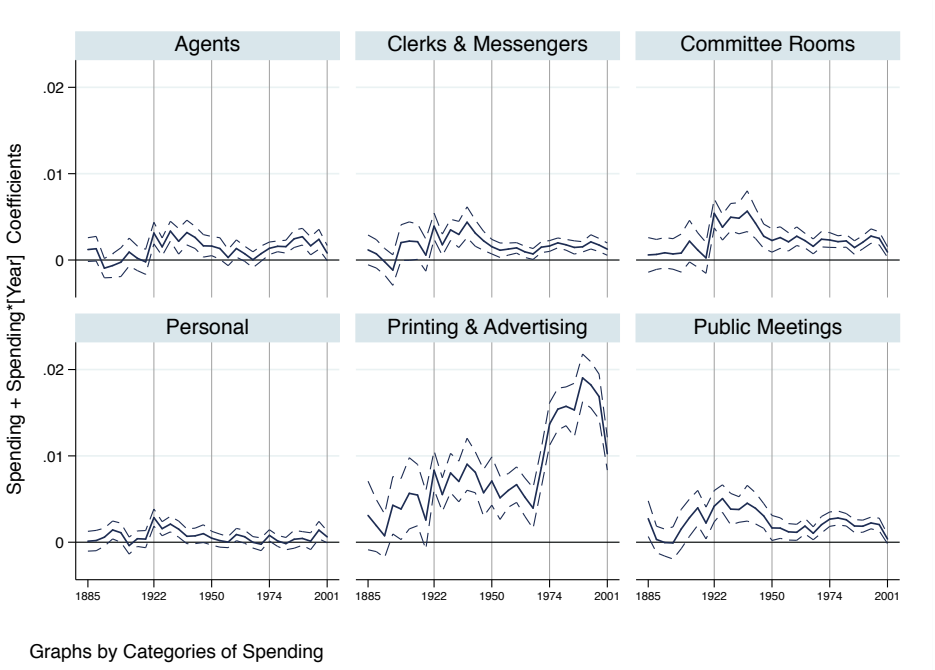



(a) 1885-1918 (b) 1922-1945 (c) 1950-1970

(d) 1974-1997 (e) 2001-2017 (f) Legend

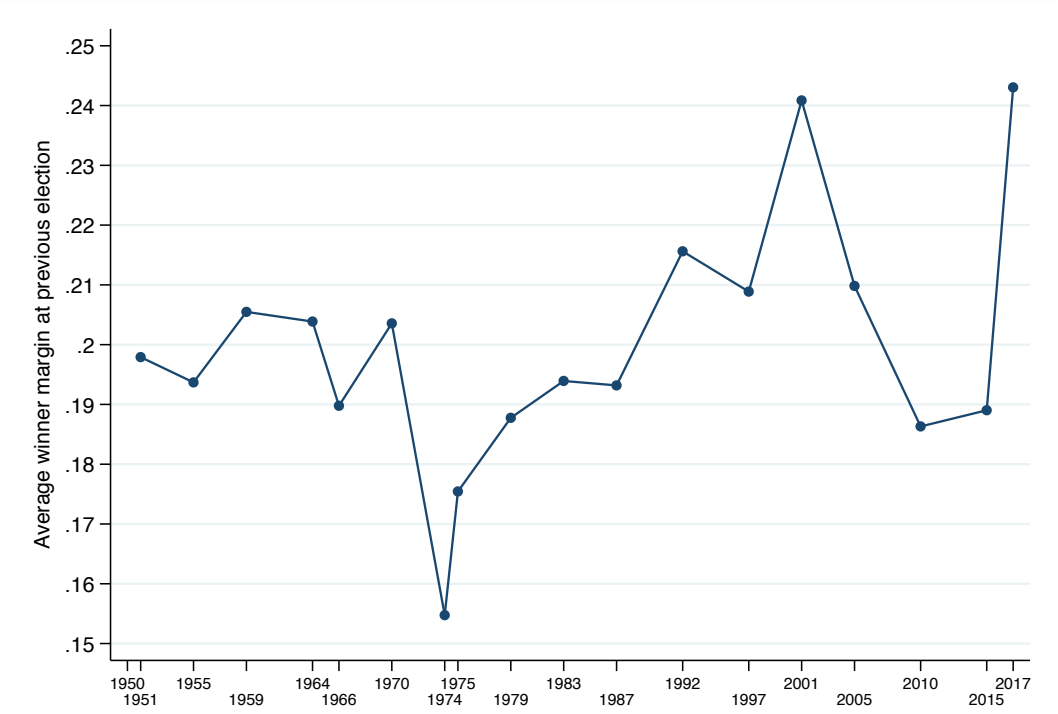
**Notes:** The maps represent the estimated spending coefficients, to which are added, when significant, the coefficients for this spending interacted with a region fixed-effect.

Figure 6: Evolution of the relationship between candidates' share of total spending and vote share, depending on the region, 1885-2017




**Notes:** The figure plots, for each election year, the point estimates and 95% confidence intervals of the linear combination of spending-category (as the share of the candidate spending in this category over all candidates spending in this category) coefficient and its interaction with an election-year dummy.

Figure 7: Evolution of the relationship between candidates' share of total spending and vote share, depending on the expenses categories, 1885-2001



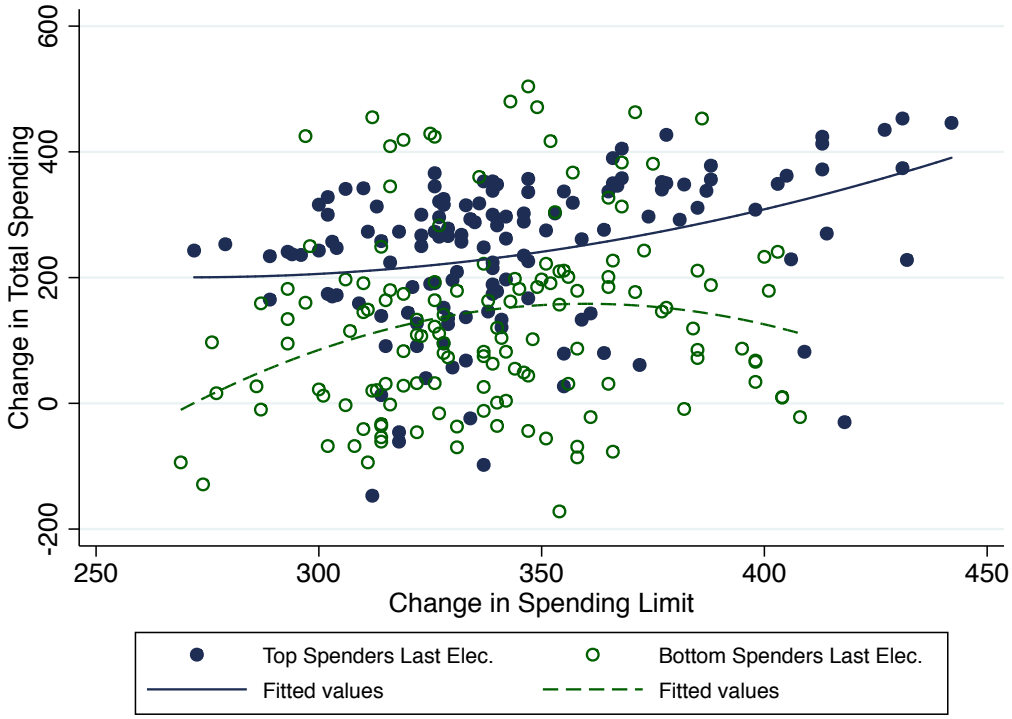

**Notes:** The figures plots the average difference in votes between the candidates arriving first and second in the constituency at the previous election.

Figure 8: Average winning party's margin at the previous election, 1950-2017



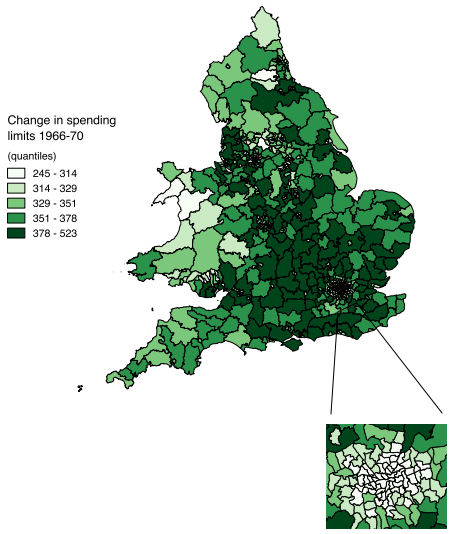

**Notes:** The graph plots the average votes shares obtained by Labour candidates depending on their sponsorship status.

Figure 9: Average vote shares, by Trade Union's sponsorship status

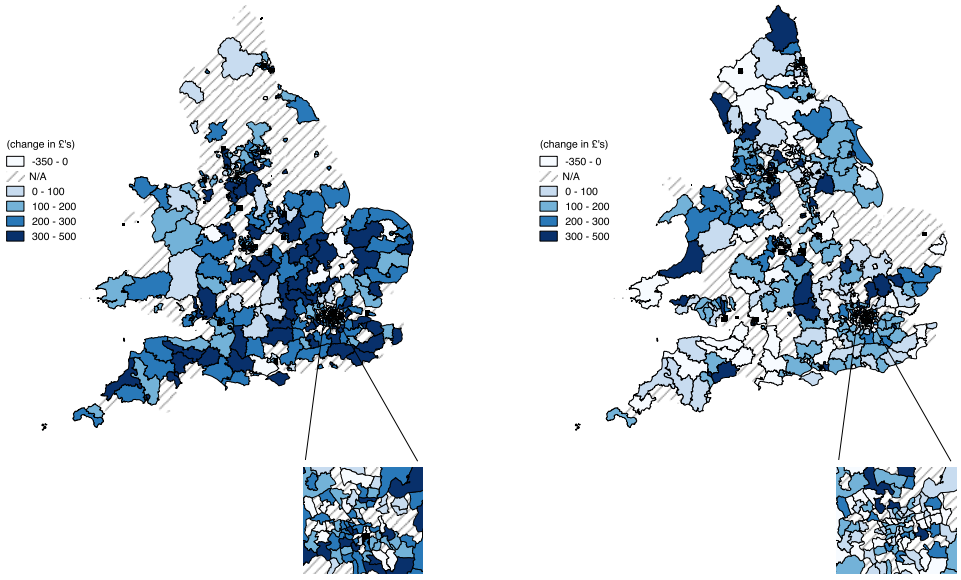



**Notes:** The graph plots in plain dots the 1966-1970 change in total spending of candidates who were close to the spending limit in 1966 ($>$ 97% ; top 25% spenders) and in hollow dots the change in total spending of those who were not ($<$ 79% ; bottom 25% spenders), as a function of the change in spending limit in their constituency.

Figure 10: Relationship between candidates' change in total expenses and the change in the spending limit in their constituency, depending on whether they were close to the 1966 spending limit




(a) Change in Spending Limits, 1966-1970




(b) Change in expenses – Close to the limit in 1966 (c) Change in expenses – Far from the limit in 1966

**Notes:** The upper map represents the change in the spending limit between the 1966 and the 1970 general elections, following the 1969 extension of voting rights to 18- to 20-year old. The bottom maps compare the average change in parties total expenses between the 1966 and the 1970 elections for the parties near the spending limit in 1966 (left) and for those significantly below (right).

Figure 11: Relationship between candidates' change in total expenses and the change in the spending limit in their constituency, depending on whether they were close to the 1966 spending limit

Table 1: Summary statistics: Number of candidates running

| | Number of candidates | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Median | sd | Min | Max | N |
| **The (news)paper-only epoch** | | | | | | |
| 1885 | 2.1 | 2.0 | 0.3 | 2 | 4 | 502 |
| 1886 | 2.0 | 2.0 | 0.1 | 2 | 3 | 371 |
| 1892 | 2.0 | 2.0 | 0.2 | 2 | 4 | 480 |
| 1895 | 2.1 | 2.0 | 0.2 | 2 | 3 | 395 |
| 1900 | 2.0 | 2.0 | 0.2 | 2 | 4 | 357 |
| 1906 | 2.1 | 2.0 | 0.3 | 2 | 4 | 484 |
| 1910 | 2.1 | 2.0 | 0.3 | 2 | 3 | 508 |
| 1911 | 2.0 | 2.0 | 0.2 | 2 | 4 | 425 |
| **The radio days** | | | | | | |
| 1922 | 2.5 | 2.0 | 0.6 | 2 | 5 | 525 |
| 1923 | 2.5 | 2.0 | 0.5 | 2 | 4 | 531 |
| 1924 | 2.4 | 2.0 | 0.5 | 2 | 4 | 540 |
| 1929 | 2.9 | 3.0 | 0.4 | 2 | 4 | 564 |
| 1931 | 2.2 | 2.0 | 0.5 | 2 | 4 | 518 |
| 1935 | 2.3 | 2.0 | 0.5 | 2 | 4 | 538 |
| 1945 | 2.7 | 3.0 | 0.7 | 2 | 5 | 590 |
| **The early television time** | | | | | | |
| 1950 | 3.0 | 3.0 | 0.6 | 2 | 5 | 613 |
| 1951 | 2.2 | 2.0 | 0.4 | 2 | 4 | 613 |
| 1955 | 2.2 | 2.0 | 0.5 | 2 | 4 | 618 |
| 1959 | 2.4 | 2.0 | 0.6 | 2 | 4 | 618 |
| 1964 | 2.8 | 3.0 | 0.6 | 2 | 5 | 618 |
| 1966 | 2.7 | 3.0 | 0.6 | 2 | 6 | 618 |
| 1970 | 2.9 | 3.0 | 0.7 | 2 | 6 | 618 |
| **The mass-media age** | | | | | | |
| 1974 | 3.3 | 3.0 | 0.7 | 2 | 7 | 623 |
| 1975 | 3.5 | 3.0 | 0.7 | 3 | 6 | 623 |
| 1979 | 4.0 | 4.0 | 0.9 | 2 | 9 | 623 |
| 1983 | 3.9 | 4.0 | 1.0 | 3 | 11 | 633 |
| 1987 | 3.6 | 3.0 | 0.7 | 3 | 7 | 633 |
| 1992 | 4.5 | 4.0 | 1.1 | 3 | 10 | 634 |
| 1997 | 5.6 | 5.0 | 1.4 | 3 | 10 | 641 |
| **The Internet era** | | | | | | |
| 2001 | 5.0 | 5.0 | 1.2 | 2 | 9 | 641 |
| 2005 | 5.5 | 5.0 | 1.4 | 3 | 15 | 628 |
| 2010 | 6.2 | 6.0 | 1.4 | 3 | 12 | 632 |
| 2015 | 6.0 | 6.0 | 1.2 | 3 | 13 | 632 |
| 2017 | 5.0 | 5.0 | 1.0 | 2 | 12 | 632 |

**Notes:** The table presents summary statistics on the number of candidates running in the General Elections. The observations are at the constituency level. Note that the minimum number of candidates is always 2 given that in our analysis we have dropped the uncontested constituencies (see the text for details).

Table 2: Summary statistics: campaign spending

| | Spending (cst 2016 €) | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Median | sd | Min | Max | N |
| **Total spending per candidate** | | | | | | |
| 1857-1885 | 102,825 | 50,006 | 140,572 | 0 | 1,503,898 | 3,902 |
| 1885-1911 | 79,375 | 72,667 | 42,001 | 0 | 400,226 | 8,529 |
| 1922-1945 | 35,608 | 34,381 | 18,378 | 0 | 177,205 | 10,093 |
| 1950-1970 | 15,206 | 15,194 | 6,063 | 0 | 32,473 | 11,284 |
| 1974-1997 | 7,424 | 7,348 | 4,750 | 0 | 40,157 | 17,987 |
| 2001-2017 | 4,800 | 2,383 | 4,999 | 0 | 32,844 | 17,494 |
| **— Normalized by Average Annual Earnings** | | | | | | |
| 1857-1885 | 20.93 | 10.51 | 28.34 | 0 | 331.03 | 3,902 |
| 1885-1911 | 11.05 | 10.18 | 5.75 | 0 | 53.16 | 8,529 |
| 1922-1945 | 4.25 | 4.09 | 2.22 | 0 | 19.96 | 10,093 |
| 1950-1970 | 1.33 | 1.19 | 0.69 | 0 | 3.46 | 11,284 |
| 1974-1997 | 0.38 | 0.38 | 0.25 | 0 | 1.98 | 17,987 |
| 2001-2017 | 0.18 | 0.09 | 0.18 | 0 | 1.20 | 17,494 |
| **Total Spending per candidate & per voter** | | | | | | |
| 1857-1885 | 21.32 | 10.67 | 31.17 | 0 | 373.28 | 3,902 |
| 1885-1911 | 7.51 | 7.16 | 4.09 | 0 | 36.19 | 8,529 |
| 1922-1945 | 0.82 | 0.78 | 0.43 | 0 | 2.30 | 10,093 |
| 1950-1970 | 0.28 | 0.27 | 0.12 | 0 | 0.92 | 11,284 |
| 1974-1997 | 0.12 | 0.12 | 0.08 | 0 | 0.57 | 17,987 |
| 2001-2017 | 0.07 | 0.03 | 0.07 | 0 | 0.59 | 17,442 |
| **Spending as a share of the legal maximum** | | | | | | |
| 1857-1885 | . | . | . | . | . | 0 |
| 1885-1911 | 0.70 | 0.77 | 0.27 | 0 | 1.85 | 8,529 |
| 1922-1945 | 0.56 | 0.56 | 0.27 | 0 | 1.92 | 10,085 |
| 1950-1970 | 0.73 | 0.79 | 0.24 | 0 | 1.11 | 11,284 |
| 1974-1997 | 0.52 | 0.52 | 0.33 | 0 | 1.49 | 17,959 |
| 2001-2017 | 0.32 | 0.15 | 0.33 | 0 | 1.45 | 17,442 |
| **— only Labour, Liberal, and Conservative** | | | | | | |
| 1857-1885 | . | . | . | . | . | 0 |
| 1885-1911 | 0.72 | 0.78 | 0.26 | 0 | 1.85 | 8,141 |
| 1922-1945 | 0.57 | 0.57 | 0.27 | 0 | 1.92 | 9,328 |
| 1950-1970 | 0.75 | 0.81 | 0.22 | 0 | 1.11 | 10,500 |
| 1974-1997 | 0.64 | 0.69 | 0.28 | 0 | 1.23 | 13,028 |
| 2001-2017 | 0.49 | 0.46 | 0.34 | 0 | 1.45 | 9,431 |

**Notes:** The table presents summary statistics on spending by candidates running in general elections. For the "total spending per candidate" and the total spending "per candidate & per voter" variables, an observation is a candidate/election. For the "total spending per constituency" variable, an observation is an electoral constituency / election.

Table 3: Summary statistics: candidates' characteristics

| | Mean | Median | sd | N |
|---|---|---|---|---|
| Gender (male=1) | 0.89 | 1.00 | 0.31 | 60,402 |
| Incumbent | 0.25 | 0.00 | 0.43 | 60,402 |
| **Titles** | | | | |
| Nobility title | 0.05 | 0.00 | 0.22 | 60,402 |
| Grade in the army | 0.04 | 0.00 | 0.20 | 60,402 |
| Civilian honor | 0.02 | 0.00 | 0.14 | 60,402 |
| Minister of a religion | 0.00 | 0.00 | 0.05 | 60,402 |
| **Political parties** | | | | |
| Conservative Party | 0.30 | 0.00 | 0.46 | 60,402 |
| Liberal Party | 0.24 | 0.00 | 0.43 | 60,402 |
| Labour Party | 0.25 | 0.00 | 0.43 | 60,402 |
| SNP | 0.00 | 0.00 | 0.05 | 60,402 |
| UKIP | 0.04 | 0.00 | 0.19 | 60,402 |
| Other | 0.18 | 0.00 | 0.38 | 60,402 |

**Notes:** The table presents summary statistics on candidates' characteristics. An observation is a candidate-election. The time period is 1885-2017. Variables are described in more details in the text.

Table 4: Summary statistics: constituency-level controls, 1885-2017.

| | 1885-2017 | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Median | sd | Min | Max | N |
| **Controls always included** | | | | | | |
| Number of candidates running | 3.3 | 3.0 | 1.5 | 2.0 | 15.0 | 19,210 |
| Nb. consecutive GEs won by incumb. party | 5.2 | 4.0 | 4.2 | 1.0 | 18.0 | 19,210 |
| 1st-2nd margin at last election | 0.20 | 0.15 | 0.21 | 0.00 | 1.00 | 19,210 |
| **Controls included in some specifications** | | | | | | |
| Total population | 81,050 | 80,636 | 20,204 | 4,365 | 312,864 | 19,210 |
| Number of registered electors | 49,921 | 54,963 | 23,181 | 2,015 | 167,939 | 19,210 |
| Total spending per reg. vot. | 3.9 | 0.7 | 7.0 | 0.0 | 65.2 | 19,210 |
| Turnout | 74.5 | 75.4 | 8.9 | 34.1 | 97.4 | 19,210 |

**Notes:** The table presents summary statistics on the constituencies' characteristics that are included over the whole 1885-2017 time period. An observation is a constituency-election. Variables are described in more details in the text.

Table 5: Relationship between candidates' share of total spending and vote share (logarithm of the ratio of the number of votes over absentention), 1885-2017

| | 1885-2017 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Share of constituency total spending | 0.027*** | 0.022*** | 0.019*** | 0.012*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Constit FE | Yes | Yes | Yes | No |
| Election-Party FE | Yes | Yes | Yes | Yes |
| Candidate FE | No | No | No | Yes |
| Constit-level controls | No | Yes | Yes | Yes |
| Candidate-level controls | No | Yes | Yes | Yes |
| Candidates | All | All | Mtp times | Mtp times |
| R-sq (within) | 0.22 | 0.28 | 0.29 | 0.12 |
| Observations | 63,263 | 63,263 | 42,401 | 42,349 |
| Cluster (Constit) | 2,016 | 2,016 | 2,000 | 2,000 |
| Mean DepVar | -0.7 | -0.7 | -0.3 | -0.3 |
| Sd DepVar | 1.7 | 1.7 | 1.4 | 1.4 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, and election-party fixed effects. Columns (1) to (3) also control for party fixed effects, and Column (4) for candidates fixed effects. Standard errors are clustered at the district level. The district-level controls are listed in the text. The candidate-level controls include the sex, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 6: Effect of candidates' share of total spending on vote share (logarithm of the ratio of the number of votes over absentention), depending on the expenses categories, 1885-2001

| | 1885-2001 | | | | | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Agents | 0.0014*** | | | | | | 0.0007*** |
| | (0.0001) | | | | | | (0.0001) |
| Clerks & Messengers | | 0.0016*** | | | | | 0.0009*** |
| | | (0.0001) | | | | | (0.0001) |
| Printing & Advertising | | | 0.0087*** | | | | 0.0069*** |
| | | | (0.0004) | | | | (0.0004) |
| Meetings | | | | 0.0019*** | | | 0.0011*** |
| | | | | (0.0001) | | | (0.0001) |
| Miscalleneous | | | | | 0.0015*** | | 0.0007*** |
| | | | | | (0.0001) | | (0.0001) |
| Personal | | | | | | 0.0005*** | -0.0000 |
| | | | | | | (0.0001) | (0.0001) |
| Election FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constit FE | No | No | No | No | No | No | No |
| Party FE | No | No | No | No | No | No | No |
| Election-Party FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Candidate FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constit-level controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Candidate-level controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Candidates | Mtp times | Mtp times | Mtp times | Mtp times | Mtp times | Mtp times | Mtp times |
| R-sq (within) | 0.07 | 0.08 | 0.11 | 0.08 | 0.08 | 0.07 | 0.12 |
| Observations | 34,567 | 34,567 | 34,567 | 34,567 | 34,567 | 34,567 | 34,567 |
| Cluster (Constit) | 1,965 | 1,965 | 1,965 | 1,965 | 1,965 | 1,965 | 1,965 |
| Mean DepVar | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sd DepVar | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, election-party fixed effects, and candidates fixed effects. Standard errors are clustered at the district level. Variables are described in more detail in the text.

Table 7: Relationship between candidates' share of total spending and vote share (logarithm of the ratio of the number of votes over absentention), depending on the spending limit per registered voter, 1885-2017

| | 1885-2017 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Share of constituency total spending | 0.022*** | 0.024*** | 0.012*** | 0.013*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Spending Limit per RV | | 0.095*** | | 0.014* |
| | | (0.010) | | (0.009) |
| Limit * Share of spending | | -0.002*** | | -0.001*** |
| | | (0.000) | | (0.000) |
| Election FE | Yes | Yes | Yes | Yes |
| Constit FE | Yes | Yes | No | No |
| Party FE | Yes | Yes | No | No |
| Election-Party FE | Yes | Yes | Yes | Yes |
| Candidate FE | No | No | Yes | Yes |
| Constit-level controls | Yes | Yes | Yes | Yes |
| Candidate-level controls | Yes | Yes | Yes | Yes |
| Candidates | All | All | Mtp times | Mtp times |
| R-sq (within) | 0.28 | 0.29 | 0.12 | 0.12 |
| Observations | 63,263 | 63,236 | 42,369 | 42,354 |
| Cluster (Constit) | 2,016 | 2,016 | 2,016 | 2,016 |
| Mean DepVar | -0.7 | -0.7 | -0.3 | -0.3 |
| Sd DepVar | 1.7 | 1.7 | 1.4 | 1.4 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, and election-party fixed effects. Columns (2) and (3) also control for party fixed effects, and Column (4) for candidates fixed effects. Standard errors are clustered at the district level. The district-level controls are listed in the text. The candidate-level controls include the sex, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 8: Relationship between candidates' share of total spending and vote share (logarithm of the ratio of the number of votes over absentention), depending on the closeness of the election (measured by the winner margin at previous elections), 1950-2017

| | 1950-2017 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Share of constituency total spending | 0.025*** | 0.031*** | 0.016*** | 0.020*** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Winner margin at previous election | -0.101*** | 0.451*** | -0.370*** | 0.117 |
| | (0.029) | (0.054) | (0.039) | (0.080) |
| Margin * Share Spending | | -0.023*** | | -0.018*** |
| | | (0.002) | | (0.002) |
| Election FE | Yes | Yes | Yes | Yes |
| Constit FE | Yes | Yes | No | No |
| Party FE | Yes | Yes | No | No |
| Election-Party FE | Yes | Yes | Yes | Yes |
| Candidate FE | No | No | Yes | Yes |
| Constit-level controls | Yes | Yes | Yes | Yes |
| Candidate-level controls | Yes | Yes | Yes | Yes |
| Candidates | All | All | Mtp times | Mtp times |
| R-sq (within) | 0.30 | 0.31 | 0.18 | 0.18 |
| Observations | 44,660 | 44,660 | 27,351 | 27,351 |
| Cluster (Constit) | 897 | 897 | 891 | 891 |
| Mean DepVar | -1.2 | -1.2 | -0.7 | -0.7 |
| Sd DepVar | 1.7 | 1.7 | 1.5 | 1.5 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, and election-party fixed effects. Columns (2) and (3) also control for party fixed effects, and Column (4) for candidates fixed effects. Standard errors are clustered at the district level. The district-level controls are listed in the text. The candidate-level controls include the sex, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 9: Relationship between candidates' share of total spending and vote share (logarithm of the ratio of the number of votes over absentention), depending on the age of the candidate, 1950-2017

| | 1950-2015 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Share of constituency total spending | 0.0247*** | 0.0288*** | 0.0145*** | 0.0295*** |
| | (0.0005) | (0.0011) | (0.0006) | (0.0018) |
| Age | 0.0004 | 0.0027*** | -0.0002 | 0.0085*** |
| | (0.0003) | (0.0007) | (0.0010) | (0.0016) |
| Age * Share Spending | | -0.0001*** | | -0.0003*** |
| | | (0.0000) | | (0.0000) |
| Election FE | Yes | Yes | Yes | Yes |
| Constit FE | Yes | Yes | No | No |
| Party FE | Yes | Yes | No | No |
| Election-Party FE | Yes | Yes | Yes | Yes |
| Candidate FE | No | No | Yes | Yes |
| Constit-level controls | Yes | Yes | Yes | Yes |
| Candidate-level controls | Yes | Yes | Yes | Yes |
| TGHC Candidate-level controls | Yes | Yes | Yes | Yes |
| Candidates | All | All | Mtp times | Mtp times |
| R-sq (within) | 0.41 | 0.41 | 0.20 | 0.21 |
| Observations | 30,782 | 30,782 | 21,438 | 21,438 |
| Cluster (Constit) | 888 | 888 | 893 | 893 |
| Mean DepVar | -0.5 | -0.5 | -0.2 | -0.2 |
| Sd DepVar | 1.3 | 1.3 | 1.1 | 1.1 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a candidate-election. The dependent variable is the logarithm of the ratio of the number of votes obtained by a candidate over abstention. All the estimations include district fixed effects, election fixed effects, and election-party fixed effects. Columns (2) and (3) also control for party fixed effects, and Column (4) for candidates fixed effects. Standard errors are clustered at the district level. The district-level controls are listed in the text. The candidate-level controls include the sex, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. Variables are described in more detail in the text.

Table 10: IV Strategy I - *2SLS estimation* – Effect of being sponsored by a Trade Union during the 1927 TU political funding reform on the change in *Labour candidates'* vote shares between 1924 and 1929 elections, through a change in their total spending per elector.

| | Change in candidate spending | | | | Change in vote share | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Sponsored by TU | -0.1461*** | -0.1329*** | -0.1463*** | -0.1515*** | | | | |
| | (0.0261) | (0.0300) | (0.0310) | (0.0312) | | | | |
| Change in candidate spending (per elec) | | | | | 0.6782*** | 0.6101** | 0.5815** | 0.5776*** |
| | | | | | (0.2591) | (0.2518) | (0.2287) | (0.2222) |
| Candidate-level controls | | | | | No | Yes | Yes | Yes |
| District-level electoral controls | | | | | No | Yes | Yes | Yes |
| District-level socio-dem controls | | | | | No | No | Yes | Yes |
| Pre-Trends controls | | | | | No | No | No | Yes |
| Observations | 194 | 194 | 194 | 176 | 194 | 194 | 194 | 176 |
| F-stat for Weak identification | | | | | 31 | 20 | 22 | 24 |
| Underidentification (p-value) | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean DepVar | | | | | 0.0674 | 0.0674 | 0.0674 | 0.0490 |
| Sd DepVar | | | | | 0.2424 | 0.2424 | 0.2424 | 0.2284 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using 2SLS estimates. An observation is a Labour Party candidate in 1929. Our sample is restricted to the candidates who ran both in the 1924 and in the 1929 elections. Coefficients for the controls are not reported for the sake of space. The candidate-level controls include her gender, nobility and army titles, and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. The district-level electoral controls include the variation in the number of candidates running in the constituency, the type of the constituency, the number of consecutive elections the incumbent party won, and the victory margin of the incumbent party at the last election. The district-level socio-demographic controls are expressed in *change* between the 1924 and 1929 election, and are described in more detail in the text. Robust standard errors in parentheses.

Table 11: IV Strategy II - *2SLS estimation* – Effect of the change in spending limits between the 1966 and the 1970 elections on the change in *candidates*' vote shares, through an increase in their total spending.

| | Change in candidate spending | | | | Change in vote share | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Share limit spent*Change in limit | 1.9910* | 2.0017* | 1.9102* | 1.9732* | | | | |
| | (1.0811) | (1.0774) | (1.0718) | (1.1237) | | | | |
| Change in spending limit 1966-1970 | -0.6002 | -0.5864 | -0.6737 | -0.7524 | | | | |
| | (0.9727) | (0.9691) | (0.9829) | (1.0213) | | | | |
| Share of limit spent in 1966 | -404.6309 | -419.8583 | -422.7144 | -432.2476 | | | | |
| | (369.5892) | (367.1628) | (364.4149) | (381.9900) | | | | |
| Change in candidate spending | | | | | 0.0003** | 0.0003** | 0.0004** | 0.0005*** |
| | | | | | (0.0002) | (0.0001) | (0.0002) | (0.0002) |
| Candidate-level controls | | | | | No | Yes | Yes | Yes |
| District-level electoral controls | | | | | No | Yes | Yes | Yes |
| District-level socio-dem controls | | | | | No | No | Yes | Yes |
| Pre-Trends controls | | | | | No | No | No | Yes |
| Observations | 553 | 553 | 553 | 549 | 553 | 553 | 553 | 549 |
| F-stat for Weak identification | | | | | 38 | 33 | 16 | 15 |
| Underidentification (p-value) | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean DepVar | | | | | -0.2771 | -0.2771 | -0.2771 | -0.2765 |
| Sd DepVar | | | | | 0.1858 | 0.1858 | 0.1858 | 0.1819 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using 2SLS estimates. An observation is a candidate in 1970. Our sample is restricted to the candidates who run both in the 1966 and in the 1970 elections. The candidate-level controls include her gender and an indicator variable equal to one if the candidate is the incumbent and to zero otherwise. Coefficients for the controls are not reported for the sake of space. The district-level electoral controls include the variation in the number of candidates running in the constituency, the number of consecutive elections the incumbent party won, and the victory margin of the incumbent party at the last election. The district-level socio-demographic controls are expressed in *change* between the 1966 and 1970 election, and are described in more detail in the text. Pre-trends control include the party vote share in 1964 and the change in spending between the 1964 and the 1966 elections. Robust standard errors in parentheses.

Table 12: Campaign spending and turnout, depending on the time period

| | 1885-2017 | | 1885-1911 | 1922-1945 | 1950-1970 | 1974-1997 | 2001-2017 |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Total spending | 0.50*** | 0.49*** | 0.46*** | 2.74*** | 1.67** | 7.30*** | 3.17** |
| | (0.03) | (0.03) | (0.03) | (0.18) | (0.78) | (0.56) | (1.28) |
| Number of candidates running | | 0.16*** | -1.69*** | -0.26 | 1.30*** | -0.06 | -0.03 |
| | | (0.04) | (0.37) | (0.20) | (0.15) | (0.05) | (0.05) |
| Election FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constit FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constit-level controls | No | Yes | No | No | No | No | No |
| R-sq (within) | 0.04 | 0.09 | 0.14 | 0.13 | 0.08 | 0.09 | 0.02 |
| Observations | 19,171 | 19,171 | 3,522 | 3,768 | 4,316 | 4,385 | 3,106 |
| Cluster (Constit) | 1,977 | 1,977 | 514 | 567 | 653 | 677 | 642 |
| Mean DepVar | 74.5 | 74.5 | 80.9 | 73.9 | 77.9 | 74.1 | 64.1 |
| Sd DepVar | 8.9 | 8.9 | 8.3 | 8.0 | 6.9 | 5.7 | 6.8 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a district/election. All the estimations include district fixed effects and election fixed effects. Standard errors are clustered at the district level. Variables are described in more detail in the text.

Table 13: Campaign spending and turnout, depending on the time period and on the political parties

| | 1885-1911 | 1922-1945 | 1950-1970 | 1974-1997 | 2001-2015 |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Conservative spending | 55.8*** | 165.2*** | 234.3*** | 33.7*** | -0.7 |
| | (5.4) | (16.1) | (32.7) | (3.4) | (2.8) |
| Liberal spending | 52.1*** | 134.0*** | 184.8*** | 13.9*** | 4.2 |
| | (4.2) | (14.0) | (23.3) | (2.5) | (3.1) |
| Labour spending | | 136.2*** | -20.3 | 17.4*** | 11.0*** |
| | | (20.4) | (30.9) | (2.7) | (2.0) |
| UKIP spending | | | | | -8.9** |
| | | | | | (3.8) |
| Other parties spending | 17.0*** | 80.0*** | 119.3*** | -1.5 | 4.8** |
| | (5.8) | (17.0) | (29.1) | (2.2) | (2.3) |
| Number of candidates running | -0.6 | -0.1 | 0.3* | 0.1*** | 0.0 |
| | (0.4) | (0.2) | (0.2) | (0.1) | (0.1) |
| Election FE | Yes | Yes | Yes | Yes | Yes |
| Constit FE | Yes | Yes | Yes | Yes | Yes |
| R-sq (within) | 0.16 | 0.13 | 0.15 | 0.11 | 0.04 |
| Observations | 3,522 | 3,768 | 4,316 | 4,385 | 2,475 |
| Cluster (Constit) | 514 | 567 | 653 | 677 | 642 |
| Mean DepVar | 80.9 | 73.9 | 77.9 | 74.1 | 62.9 |
| Sd DepVar | 8.3 | 8.0 | 6.9 | 5.7 | 6.7 |

**Notes:** * p<0.10, ** p<0.05, *** p<0.01. The models are estimated using OLS estimates. An observation is a district/election. All the estimations include district fixed effects and election fixed effects. Standard errors are clustered at the district level. Variables are described in more detail in the text.