American Political Science Review (2021) 115, 2, 395–411
doi:10.1017/S0003055420001008 © The Author(s), 2020. Published by Cambridge University Press on behalf of the American Political Science Association

How Do Campaign Spending Limits Affect Elections? Evidence from the United Kingdom 1885–2019

ALEXANDER FOUIRNAIES *University of Chicago*

In more than half of the democratic countries in the world, candidates face legal constraints on how much money they can spend on their electoral campaigns, yet we know little about the consequences of these restrictions. I study how spending limits affect UK House of Commons elections. I contribute new data on the more than 70,000 candidates who ran for a parliamentary seat from 1885 to 2019, and I document how much money each candidate spent, how they allocated their resources across different spending categories, and the spending limit they faced. To identify the effect on elections, I exploit variation in spending caps induced by reforms of the spending-limit formula that affected some but not all constituencies. The results indicate that when the level of permitted spending is increased, the cost of electoral campaigns increases, which is primarily driven by expenses related to advertisement and mainly to the disadvantage of Labour candidates; the pool of candidates shrinks and elections become less competitive; and the financial and electoral advantages enjoyed by incumbents are amplified.

INTRODUCTION

The regulation of campaign finance is a fundamental electoral institution in modern democracies. Imposing legal limits on candidate campaign expenditures is one the most common ways, globally, to regulate campaign finance. As illustrated by the map in Figure 1, more than half of the democratic countries in the world impose limits on candidate campaign expenditures in national elections (Ohman 2012, 37).

Scholars have long theorized about the electoral consequences of campaign spending caps, but they disagree on the theoretical predictions. Some claim that "spending caps are anti-competitive" (Benoit and Marsh 2010; Bonneau and Cann 2011; Jacobson 1978; 1990; Palda 1994; Sahuguet and Persico 2006, 97), and some claim that "spending caps will be pro-competitive" (Avis et al. 2018; Bouton, Castanheira, and Drazen 2018; Che and Gale 1998; Iaryczower and Mattozzi 2012; Levitt 1995, 190; Prat 2002a; 2002b), whereas others claim that depending on circumstances "spending caps … can either increase or decrease competitiveness" (Meirowitz 2008, 692; Morton and Myerson 2012; Pastine and Pastine 2012) or have no effect on competition (Kaplan and Wettstein 2006).

In this paper, I provide empirical evidence on the matter by studying how campaign spending limits affect UK House of Commons elections. In order to do this, I contribute one of the longest spanning and most detailed datasets on campaign finance ever collected. Based on material from the House of Commons, I compiled a new dataset that covers approximately 99.7% of all candidates running in general elections from 1885 to 2019, producing in total more than 70,000 candidate-election observations. I document how much money each candidate spent on advertisement, agents, staff, public meetings, facilities, miscellaneous matters, their personal expenses, and the spending limit they faced.

To identify the effect of spending limits on elections, I exploit variation induced by reforms of the spending-limits formula that affected some but not all constituencies. In general, reforms implemented over the course of the twentieth century reduced the permitted level of spending, but most reforms had a differentiated effect on the permitted spending in the two types of parliamentary constituencies, boroughs and counties, permitting a difference-in-differences style design. I compare within-constituency changes in electoral outcomes following changes in the spending limits formula while differencing out common shocks affecting all constituencies and adjusting for changes in the electorate.

Figure 2 illustrates the main findings in the paper. First, when spending limits are increased, campaigns become more expensive, which is primarily driven by expenses related to advertisement and mainly to the disadvantage of Labour party candidates; second, the pool of candidates shrinks and competition is reduced; third, the financial and electoral advantages enjoyed by incumbents are amplified. In summation, high levels of permitted spending diminish electoral competition. This could suggest that the tightening of spending limits implemented over the course of the twentieth century may have fostered more competitive elections.

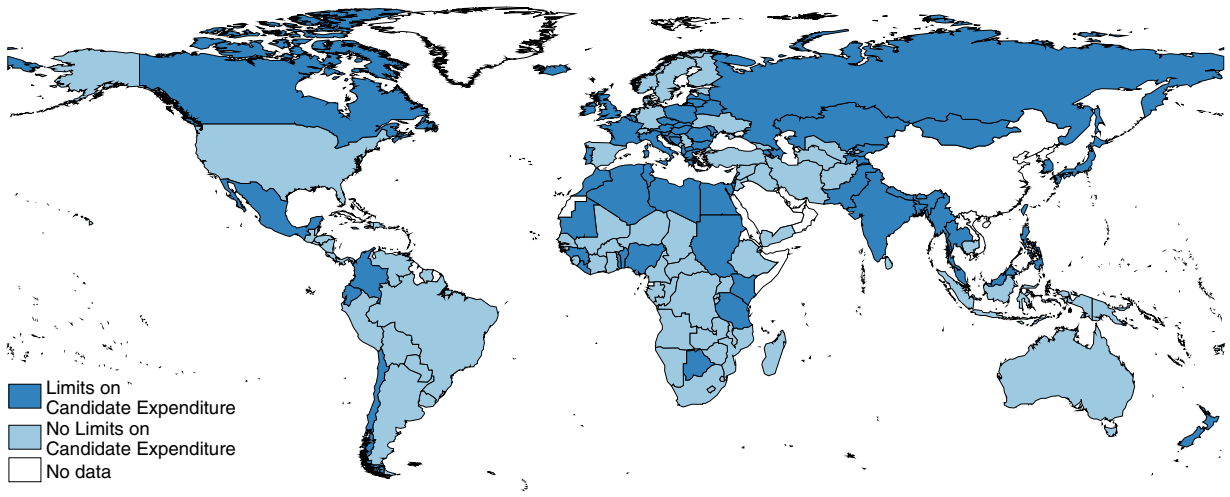
Alexander Fouirnaies, Assistant Professor, Harris School, University of Chicago, fouirnaies@uchicago.edu.

For helpful comments and suggestions, I thank Scott Ashworth, Chris Berry, Peter Buisseret, David Butler, Julia Cagé, Gary Cox, Torun Dewan, Edgard Dewitte, Wiola Dziuda, Andy Eggers, Anthony Fowler, Ron Johnston, Jens Hainmueller, Andy Hall, Dominik Hangartner, Jim Fearon, Steve Levitt, Roger Myerson, Michael Pinto-Duschinsky, Jim Snyder, Arthur Spirling, and Stephane Wolton. I thank the participants at Stanford University's Comparative Politics Workshop, Nuffield College's Politics Workshop, and the University of Copenhagen's Economics Department Workshop. I'm indebted to Andy Eggers and Arthur Spirling for generously sharing their data on the electoral outcomes of general elections. For excellent research assistance, I thank George Beknazar, Rachel Dec, Elysa Geras, Alec MacMillen, and Saurabh Sharma. All remaining errors are my own. Replication files are available at the American Political Science Review Dataverse: https://doi.org/10.7910/DVN/AP0DHP.

Received: June 05, 2019; revised: September 09, 2020; accepted: October 28, 2020. First published online: December 21, 2020.

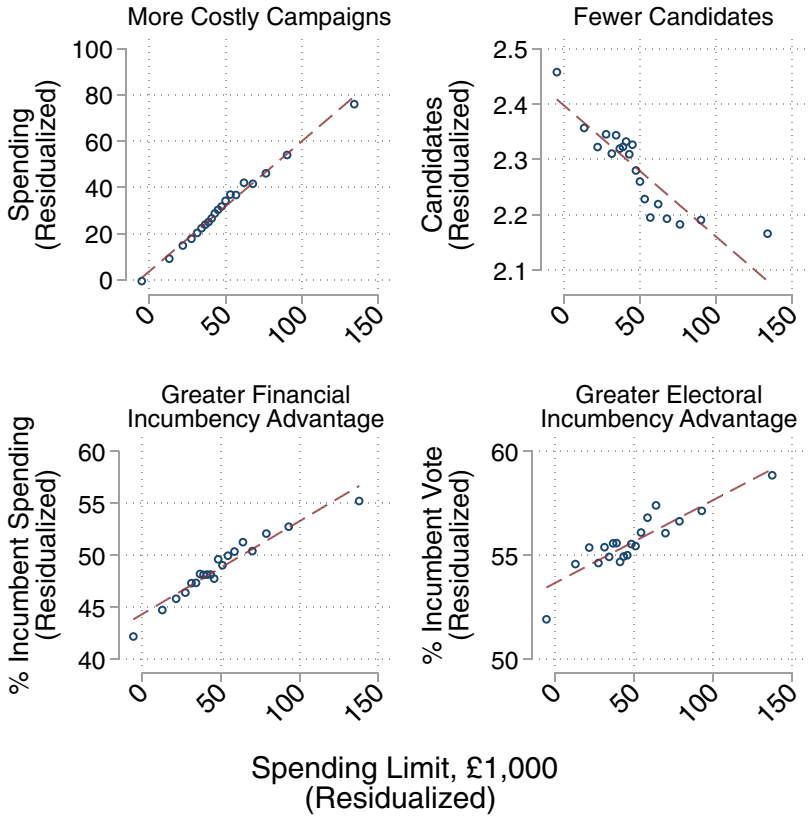
https://doi.org/10.1017/S0003055420001008 Published online by Cambridge University Press

FIGURE 1. Limits on Candidate Campaign Expenditure



Note: Approximately half of the democratic countries of the world impose limits on the money candidates are permitted to spend on their electoral campaigns. The map is constructed based on data from Ohman (2012).

FIGURE 2. Loose Spending Limits Reduce Electoral Competition



Note: After adjusting for spending-limits formula inputs, loose spending limits on average (a) increase the cost of campaigns, (b) reduce the number of candidates, and (c) amplify the financial and electoral incumbency advantages. Each partial-regression plot shows the covariation between spending limits and the outcome after adjusting for formula inputs. Each plot is constructed by running two OLS regressions of the following form: $Y_{it} = \lambda County_i + \phi Electors_{it} + \psi County_i \times Electors_{it} + \varepsilon_{it}$, where Y_{it} is the outcome variable in the first regression and the spending limits variable in the second regression, and plotting the residuals against each other in 20 equally sized bins.

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In addition to the contribution of the new data and the value of studying House of Commons elections in their own right, there are at least two reasons why this study constitutes an important contribution. First, the new panel dataset on UK elections provides key empirical advantages over the cross-sectional data used in other studies. Some questions can simply not be answered with cross-sectional data (for example, questions related to within-candidate variation), and many causal questions can be answered more convincingly with panel data. Second, many countries have directly adopted the British regulatory regime, especially many former territories of the British Empire. Studying the British system sheds light more broadly on the institutional blueprints upon which most other countries in the world have based their campaign spending restrictions.

The paper proceeds as follows: First, I briefly review the relevant literature. Then I describe the institutional context of UK campaign finance and explain the spending-limits formula. After that, I present the new dataset that I collected, and I then outline the empirical design. Following that, I present the results. Finally, I conclude with a short discussion.

RELATED LITERATURE ON CAMPAIGN FINANCE

Despite the theoretical interest and the wide-spread use of campaign spending limits, the empirical evidence on their electoral consequences is limited to two studies. Both of these studies find evidence consistent with the findings presented in this paper.

Milligan and Rekkas (2008) study the consequences of spending limits in the 1997 and 2000 parliamentary elections in Canada. Exploiting nonlinearities in the assignment of spending limits across parliamentary constituencies, they find that looser limits lead to less competitive elections, fewer candidates, and lower turnout. Avis et al. (2018) study spending limits in the 2016 mayoral elections in Brazil. Exploiting a discontinuous kink in the assignment of spending limits implemented by the Brazilian government in 2015, they find that looser spending limits reduce the number of candidates, attract self-financed candidates, and benefit incumbents.

A related but distinct empirical literature studies the effect of campaign spending on electoral outcomes. Many studies are based on data from US federal elections, and scholars have used a variety of different empirical approahces (see for example Abramowitz 1991; Bombardini and Trebbi 2011; Erikson and Palfrey 2000; Gerber 1998; Jacobson 1978; 1990; Krasno and Green 1993; Levitt 1994). In one of the most cited papers in this literature, Jacobson (1978) shows that the positive correlation between spending and vote shares is stronger for challengers than it is for incumbents. On the basis of this finding, Jacobson argues that "any reform measure which decreases spending by the candidates will favor incumbents", and that "ceilings on permissible spending, if they have any effect on it at all, can only lessen competition" (Jacobson 1978, 489).

Scholars have also studied campaign spending effects in the context of UK House of Commons elections (see for example Johnston 1979; Johnston, and Fieldhouse 1995; Johnston, Pattie, and Hartman 2019; Johnston, Pattie, and Johnston 1989; Pattie, Hartman, and Johnston 2017; Pattie and Johnston 2003; 2009; Pattie, Johnston, and Pattie 1995). Most studies are based on data from general elections from the 1970s and onwards, but Pinto-Duschinsky (1981), Johnston (2014), and Cagé and Dewitte (2020) study campaign spending from a longer historical perspective. Cagé and Dewitte (2020) also collect historical spending returns, and their data is very similar to the data used in this paper. Two systematic patterns are documented in this literature. First, constituency marginality is a strong predictor of constituency-level campaign spending: candidates spend systematically more money in competitive constituencies. Second, candidate spending positively correlates with vote shares. Similar to Jacobson (1978), these studies generally find that the association between campaign spending and votes is stronger for challengers than it is for incumbents. Pattie, Johnston, and Fieldhouse (1995, 976) interpret this as a consequence of the imposed spending limits: "The apparent lack of an incumbent spending effect here may be an 'asymptote' effect, created by the rather small variability in incumbent spending levels, itself a product of the ceiling placed on local campaign spending by statute."

Although I address a different research question, "What are the effects of campaign spending limits?" the stylized facts established in the previous research guide the empirical design in this paper. In particular, the documented heterogeneity across candidates and constituencies suggests that an empirical design tapping into within-unit variation might be more compelling than a simple cross-sectional design. I elaborate on this point in the section where I outline the empirical design.

The findings in this paper may shed light on the interpretation of the findings in the existing literature. By focusing on levels of actual campaign spending, which is realized on the equilibrium path, these studies could be missing that campaign finance may influence elections through spending threats that are made off the equilibrium path (Chamon and Kaplan 2013). The potential threat of campaign spending may shape elections, even if candidates do not spend any money. Spending limits provide a unique opportunity to jointly study actual spending and potential spending threats.

INSTITUTIONAL BACKGROUND: THE SPENDING LIMITS FORMULA

House of Commons general elections are held at least every 5 years.[1] Parliamentary candidates compete in single-member constituencies,[2] and the winner is

[1] Before 1911, general elections were held at least every 7 years.

[2] During the period between 1885 and 1949, a few constituencies elected two or three representatives (Butler 1963). For a detailed

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determined using simple plurality rule. Throughout the studied period, the vast majority of candidates represented either the Conservative Party, the Labour Party, or the Liberal (Dem.) Party.[3] Most parliamentary candidates fund and run their electoral campaigns with support from a local party organization (Johnston and Pattie 2007).[4]

Up until the late nineteenth century, general election campaigns in Britain were very corrupt. In many constituencies, candidates were involved in extensive dealings of bribery, voter intimidation, and various other forms of electoral fraud. Against the backdrop of a historically scandalous general election in 1880, William Gladstone's Second Ministry introduced the *Corrupt and Illegal Practices Prevention Act* in 1883, and the bill was passed with support from both major parties. The Act criminalized various forms of bribery; imposed limits on candidates' campaign expenditure; required candidates to fully disclose and document how they spent their money, with the back-up of official receipts; and introduced significant fines and punishments for rule violations. Candidates, along with their election agents,[5] who failed to file the required information to the returning officer within a certain number of days after the election, as well as candidates who filed erroneous information, could be subject to significant fines, unseated and banned from running for office in future, or even imprisoned.

The Act also stipulated that the legal expenditure maximum would vary across constituencies depending on the type of constituency and the number of electors therein. The historically important distinction between county and borough constituencies was used as a coarse proxy for population density and urbanization.[6] Although boroughs and counties were nearly equivalent in terms of franchise, counties were, on average, more rural and thinly populated than were boroughs. In response to these differences, it was deemed that candidates running in constituencies classified as counties should be allowed to spend more money relative to candidates in borough constituencies of the same magnitude. Approximately half of the constituencies in a given year were classified as county constituencies.

According to the Act, the specific spending limit to be faced by the candidates in a given constituency, i, in a given general election, t, was determined by the following formula:[7]

$$\begin{aligned} \textit{Spending Limit}_{it} \equiv\ & a_t + b_t \textit{Electors}_{it} + c_t \textit{County}_{it} \\ & + d_t \textit{Electors}_{it} \times \textit{County}_{it}, \end{aligned} \tag{1}$$

where a_t is a baseline lump sum amount allocated to all constituencies in year t; b_t represents the allowed spending rate per elector in year t; c_t is an additional lump sum amount allocated only to county constituencies; finally, d_t reflects the additional spending allowed per elector, again only in county constituencies.

The basic structure of the spending-limit formula as initially described in the *Corrupt and Illegal Practices Prevention Act*, remained essentially the same throughout the studied period, but the four formula coefficients (a_t, b_t, c_t, d_t) were modified on 13 occasions. Figure 3 illustrates how the different reforms affected the four formula parameters. In Figure 4, I show how the median number of electors changed over time, and I illustrate how the median spending limit developed in boroughs and counties, respectively.

To monitor compliance with the new campaign spending restrictions, the Act required candidates to fully disclose and document how they spent their money, with the back-up of official receipts. As a precaution against the temptation to submit fabricated information, the campaign expenditure returns filed by candidates and their agents were compiled by the Home Office in the months following the election and were made available for all members of the House of Commons to scrutinize.[8] The Home Office checked the receipts submitted by each candidate and wrote up a report summarizing the spending of each candidate in every constituency. These reports were then kept in the archives for parliamentary papers. The dataset introduced in this paper is based on these reports. In the appendix, I provide additional information on the data collection and digitization process.

discussion of multimember districts in Britain, see Eggers and Fouirnaies (2014).

[3] In 1988, the Liberal party merged with the Social Democratic Party, forming the Liberal Democratic Party.

[4] For a detailed discussion of funding and organization of electoral campaigns in Britain, see Pinto-Duschinsky (1981).

[5] In *Corrupt and Illegal Practices Prevention Act*, the individual who is officially responsible for managing the campaign is referred to as an election agent.

[6] The classification of geographical areas into boroughs and counties goes back to the territorial organization of England in the thirteenth century (Rossiter, Johnston, and Pattie 1999). Historically, boroughs and counties were represented differently in Parliament, and franchise differed systematically across constituencies; however, many of these fundamental differences gradually became less important following a series of franchise and boundary reforms that were implemented throughout the nineteenth century (see Berlinski and Dewan 2011). This process of reform culminated in the *Representation of the People Act 1884*, which was introduced with a declared purpose of equalizing the differences between county and borough constituencies (Blewett 1965). As a consequence of this Act, the previous distinction between counties and boroughs, which had mattered tremendously with respect to franchise, no longer served its initial purpose. University constituencies were a third, but less important, constituency type. For historical reasons, the major universities had their own parliamentary constituencies until 1949. The university constituencies are excluded from the analyses in this paper because spending limits were applied differently in these constituencies.

[7] In some periods, the number of electors was rounded before it was plugged into the formula. During the period of 1885–1910, it was rounded down to the nearest 1,000. During the period of 1969–1978, the number of electors was rounded to the nearest eight electors in boroughs and six electors in counties. The exact formulae are outlined in the appendix.

[8] Since 2001, the Electoral Commission has compiled and published the spending returns.

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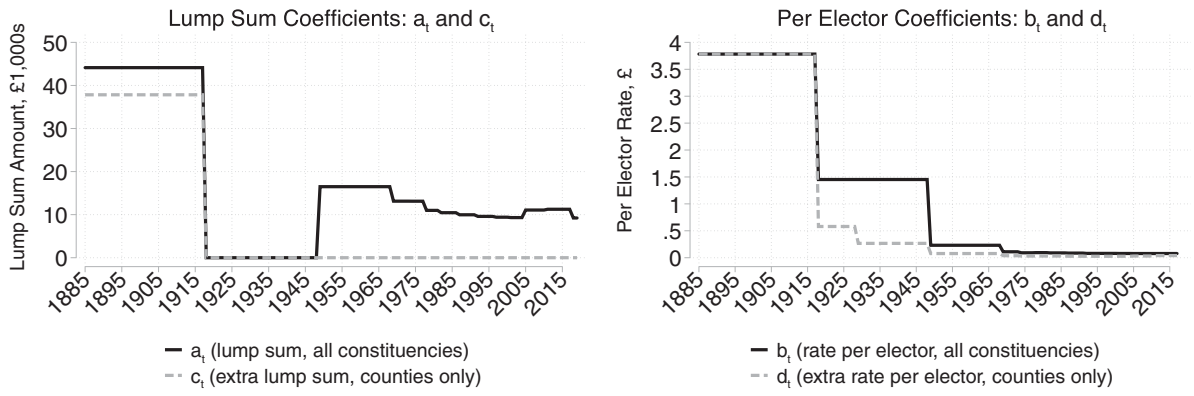
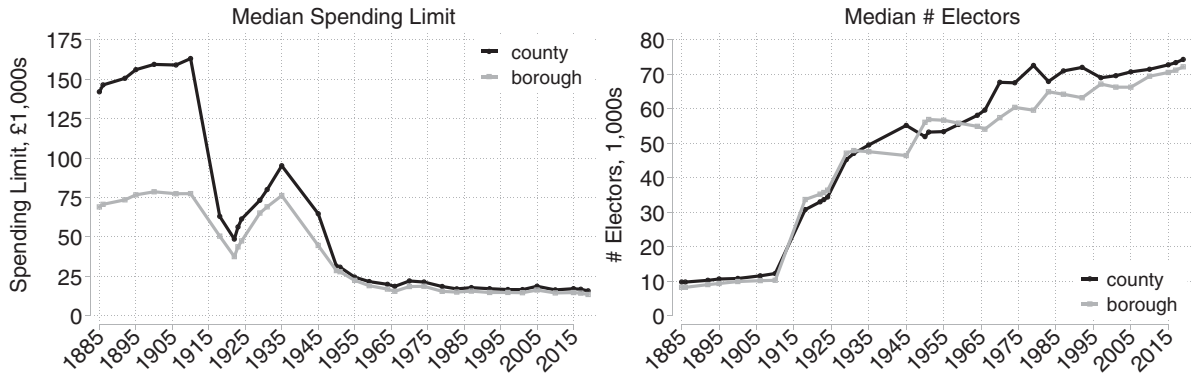
FIGURE 3. Development of Spending-Limit Formula Coefficients



Note: The amounts are reported in 2020 prices. The figure illustrates the modifications of the four parameters outlined in Equation 1.

FIGURE 4. Development of Electors and Spending Limits



Note: The amounts are reported in 2020 prices.

NEW DATA: HOUSE OF COMMONS CANDIDATES' CAMPAIGN SPENDING 1885–2019

Based on the sources described above, I constructed a dataset in which each observation pertains to a specific candidate in a given general election from 1885 to 2019. In total, this covers more than 70,000 individual candidate-election observations. In Table 1, I report basic summary statistics for the variables used in the study. To facilitate meaningful comparisons over time, all monetary variables are adjusted for inflation and reported in 2020 prices.[9]

All campaign spending returns related to the general election of 1918 appear to have been lost, but otherwise the dataset contains nearly complete information on all candidates running for office.[10] As reported in the appendix, close to 99.7% of all candidates complied with the regulations by reporting their spending in a timely manner.[11] In the appendix, I discuss the reliability of the reported campaign spending in greater detail.

To give a sense of how the data is distributed, I plot each candidate's total spending against the corresponding spending limit in Figure 5. I fit lines through the data

[9] From 1885 to 1948, prices are adjusted using the historical consumer price index published by O'Donoghue, Golding, and Allen (2004). From 1949 to 2019, prices are adjusted using the consumer price index published by the Office of National Statistics, https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/czbh/mm23. Note that for the 2010, 2015, and 2019 general elections, the Electoral Commission distinguishes between a short and a long electoral campaign. To facilitate comparisons across time, the reported spending pertains to the short campaign.

[10] The House of Commons Library is not aware of how the 1918 filings were lost. However, based on comparisons with other documents from 1918, they believe that the files were submitted by the candidates but never compiled by the Home Office because the 1918 election was held only a month after the end of World War I and presumably compiling the expenditure returns was a relatively low priority task for the British government at the time. As a consequence, I do not think that the missing files induce any notable bias in the estimates.

[11] The few candidates who did not report their spending were either nonviable candidates running as independents or candidates representing minor parties.

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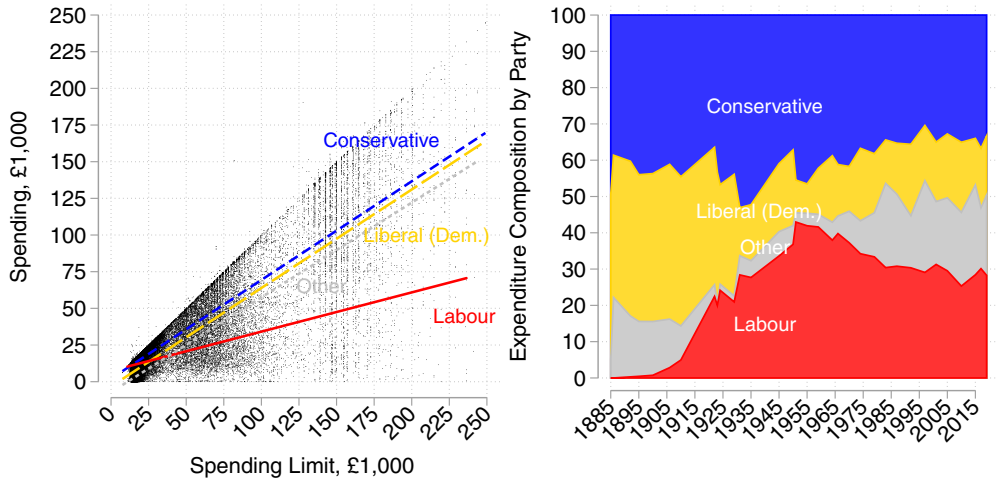
TABLE 1. Descriptive Statistics

	Mean	SD	Skew.	Min.	Max.	Obs.
			Constituency level			
Spending limit	48,222.6	47,118.0	1.8	7,587.8	452,445.0	21,282
Spending total	30,807.7	35,869.1	2.3	0.0	446,188.4	21,368
Electors	48,742.1	24,219.5	−0.4	1,066.0	167,939.0	22,082
Candidates	3.3	1.6	1.2	1.0	15.0	22,161
Effective candidates	2.3	0.6	0.4	1.0	6.0	22,161
Effective spenders	2.5	0.8	0.6	1.0	6.9	21,588
County constituency	0.5	0.5	−0.1	0.0	1.0	22,065
Incumbent vote %	55.7	14.5	1.3	8.1	100.0	15,313
Incumbent spending %	48.8	17.0	1.3	0.0	100.0	15,165
Spending on agents	6,191.4	11,252.3	2.9	0.0	87,280.4	18,122
Spending on staff	4,152.5	6,028.2	2.9	0.0	115,279.2	18,122
Spending on advertisement	15,466.0	14,636.4	2.6	0.0	213,500.2	20,722
Spending on meetings	1,164.5	1,622.3	2.5	0.0	16,212.1	20,722
Spending on facilities	1,435.7	1,886.0	3.0	0.0	34,300.2	20,722
Spending on miscellaneous	2,567.6	3,406.2	2.6	0.0	34,572.1	20,722
Personal spending	1,799.7	2,851.6	3.6	0.0	44,698.7	21,368
			Candidate level			
Spending limit	36,924.2	38,988.9	2.4	7,587.8	452,445.0	72,109
Spending total	22,850.8	31,859.7	2.8	0.0	452,445.0	70,742
Vote %	30.6	22.4	0.4	0.0	100.0	72,425
Spending %	30.6	20.6	0.5	0.0	100.0	70,651
Incumbent	0.2	0.4	1.4	0.0	1.0	72,426

Note: In the constituency-level panel, each observation pertains to constituency in a given election. In the candidate-level panel, each observation pertains to a candidate in a given election. All monetary values are adjusted for inflation and reported in 2020 prices.

FIGURE 5. New Data on More than 70,000 Candidates' Campaign Spending



Note: The amounts are reported in 2020 prices.

for each of the major parties. On average, Conservative and Liberal (Dem.) candidates spend approximately 70 pence when the spending limit increases by £1, whereas Labour candidates only spend 30 pence. In the right panel, I show how each party's share of total spending has developed over the course of the studied period.

The spending returns contain information on how candidates allocated their resources across the following types of expenditure:[12]

[12] The reporting of disaggregated spending was modified in 2010. From 2010 and onwards, candidates reported spending on all

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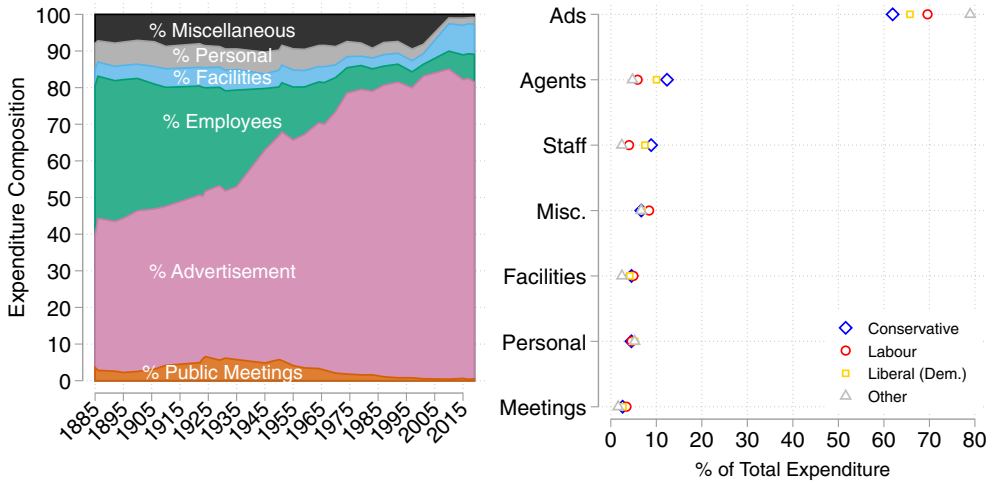
FIGURE 6. Composition by Types of Expenditure



Advertising This category sums up spending on advertisement, printing and publishing campaign material, issuing and distributing addresses and notices, stationary, postage, and telecommunications.

Agents This category sums up spending on campaign managers, election agents, subagents, polling agents, and other people responsible for managing key aspects of the campaign.[13]

Staff This category sums up spending on paid staffers, clerks, messengers, and canvassers.

Public Meetings This category sums up spending on organizing public meetings and debates. This also includes payments to external speakers.

Facilities This category sums up the cost of renting committee rooms, campaign headquarters, and other places of lodging for the purpose of the campaign.

Personal Expenses This category sums up the costs personally incurred by the candidate for the purpose of the election.

Miscellaneous Matters This variable sums up all expenses that do not fit into one of the categories outlined above.

The left panel in Figure 6 shows how the composition of candidate expenditure has changed during the studied period.[14] The right panel breaks down how the composition varies across parties.

The spending returns also report the total number of votes polled. I link each candidate in the archival material to information on party affiliations used in a series of papers by Eggers and Spirling (2014; 2016).

Based on biographical information, I construct an identifier for each individual. This identifier tracks each individual over the course of their career, even if they change their name or move to a different constituency.[15]

In order to track constituencies over time, I construct constituency identifiers using historical maps and descriptions of constituencies before and after every boundary change. I match the boundaries before and after they were redrawn, and a constituency is given a new identifier if its name, classification, or geographical boundaries changes. For recent years, this is a trivial matter, but as other researchers have pointed out this is more complicated for the early period in the data. In some cases historical maps and descriptions are inconsistent, and in those cases I consult additional material from various boundary commissions.[16]

I measure candidate entry using the number of candidates, the effective number of candidates, and the effective number of spenders. The effective number of candidates is calculated using the standard formula (Laakso and Taagepera 1979):

$$\text{Effective Candidates}_{it} \equiv \frac{1}{\sum_{p \in P_{it}} v_{pit}^2}, \tag{2}$$

where v_{pit} is the vote share of the candidate representing party p in constituency i at time t, and P_{it} is the set of parties fielding candidates in constituency i at time t. Using the same formula, I also calculate the effective

employees (no disaggregation by agents and staff), spending on advertisement/printing was disaggregated into different categories, spending on travel became a separate category (I include this in the miscellaneous category).

[13] For a detailed account of the roles of the campaign managers in British General Elections, see Fisher, Denver, and Hands (2006).

[14] In this graph, I aggregate spending on agents and staff into the category employees because expenses related to agents and staff are only reported as an aggregated amount after 2010.

[15] The same individual candidate often submits spending returns under differently spelled names from one election to the next. For example, sometimes middle names are excluded and other times they are included, and sometimes the full name is spelled out and other times it is reported using initials. I attempt to ensure that candidates are given the same identifiers, despite the differences in reported names.

[16] The dataset contains an alternative constituency variable for the cases where there is some uncertainty about the boundaries.

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spenders by substituting vote shares, v_{pit}, with their campaign spending shares, s_{pit}.

To facilitate constituency-level analyses, the candidate-level data is collapsed such that each row in the dataset pertains to a constituency in a particular general election. In this data, campaign spending variables measure the spending of the average candidate in a given constituency in a particular election.

EMPIRICAL DESIGN: EXPLOITING REFORMS OF THE SPENDING-LIMITS FORMULA

Using the dataset described above, suppose one regressed a measure of electoral competition on the level of permitted spending. For obvious reasons, it would not be sensible to interpret the coefficient on the spending limits variable as the average causal effect on electoral competition. A first-order concern is that the formula inputs may affect electoral competition. For example, suppose that the supply of candidates increases with the number of electors because the pool from which parties can recruit deepens when the population grows. This would induce bias in the estimated effect.

Could one address this concern by controlling for formula inputs? If only a single election was observed this would not be feasible. By construction, the level of permitted spending and the three formula inputs ($Electors_{it}$, $County_{it}$, and $Electors_{it} \times County_{it}$) would be perfectly multicollinear because the spending limit is a linear combination of these variables.

However, because we observe multiple general elections in which spending limits are assigned using different formula coefficients, one could exploit the panel structure to estimate equations of the form

$$\begin{aligned} Y_{it} &= \omega + \beta Spending\ Limit_{it} + \lambda County_i + \\ &\quad \phi Electors_{it} + \psi County_i \times Electors_{it} + \varepsilon_{it}. \end{aligned} \tag{3}$$

In this setting, the variation in $Spending\ Limit_{it}$ is engendered exclusively by the temporal variation in the formula coefficients (a_t, b_t, c_t and d_t in Equation 1), not the formula inputs ($Electors_{it}$, $County_{it}$, and $Electors_{it} \times County_{it}$).

Is it reasonable to interpret the estimated β in Equation 3 as the average causal effect of spending limits on electoral competition? The answer depends on whether one is willing to assume that the variation in formula coefficients is not systematically related to other determinants of electoral competition. The estimate may be biased if the formula coefficients were modified in response to changes in the electoral environment affecting electoral competition. Suppose, for example, that the modification of the formula coefficients in 1918 was implemented to offset an increase in electoral competition induced by the enfranchisement of women in the same year; this would bias the estimated effect.

To address concerns of this nature, one needs to wash out various time-specific shocks affecting all constituencies. This is possible because some reforms differentially affected county and borough constituencies. Exploiting variation from these reforms, one could estimate equations of the following form

$$\begin{aligned} Y_{it} &= \beta Spending\ Limit_{it} + \\ &\quad \lambda County_i + \psi County_i \times Electors_{it} + \\ &\quad \delta_t + \gamma_t Electors_{it} + \varepsilon_{it}, \end{aligned} \tag{4}$$

where δ_t represents time-fixed effects washing out common shocks affecting all constituencies in a given election, $\gamma_t Electors_{it}$ represents election-specific effects of the number of electors, and all other variables are the same as those in Equation 3. In this setting, the variation in $Spending\ Limit_{it}$ comes entirely from the temporal variation in the two county-specific formula coefficients (c_t and d_t in Equation 1), and it is neither affected by variation in formula inputs ($Electors_{it}$, $County_{it}$, and $Electors_{it} \times County_{it}$) nor by variation in formula coefficients affecting all constituencies (a_t, b_t).

The design is akin to a difference-in-differences design with a relaxed common-trends assumption where the identifying variation comes from reforms that differentially affected counties and boroughs. Unlike the typical difference-in-differences design, however, the treatment assignment mechanism is known, making it easier to evaluate threats to identification.

To further relax the identifying assumption, one could implement the analysis at the constituency level (as opposed to the constituency-type level) by estimating equations of the following form

$$\begin{aligned} Y_{it} &= \beta Spending\ Limit_{it} + \\ &\quad \alpha_i + \psi County_i \times Electors_{it} + \\ &\quad \delta_t + \gamma_t Electors_{it} + \varepsilon_{it}. \end{aligned} \tag{5}$$

The effects are identified by comparing within-constituency changes in electoral outcomes in county and borough constituencies following formula reforms that differentially affected these two constituency types while flexibly controlling for changes in the number of electors.

One might reasonably question how sensitive the findings are to the underlying functional-form assumptions. In the appendix, I show that the findings are qualitatively similar when using a log-transformed spending-limits variable. Further, I show that the results are not sensitive to alternative specifications and additional robustness checks. In particular, I show that one can further relax the common-trends assumption by including election-by-region fixed effects and constituency-specific linear trends and controlling for previous competitiveness in the constituency.

The estimated effect is a weighted average of the influence of the different reforms. When interpreting the results, one should keep in mind, however, that the estimates are weighted toward the reforms that most significantly affected the level of permitted spending. These reforms were primarily implemented in the early period. As a robustness check, I show in the appendix that most of the results, but not all, are robust overall when I exclude observations prior to 1918 (first reform), 1928 (second reform), and 1948 (third

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reform), although some coefficients are estimated more noisily when these data are dropped.

Important Changes in the Electoral Environment

While the long-span data provide unique research-design opportunities, this also entails important challenges. In particular, many aspects of British electoral politics have changed over the course of the studied period, and one might reasonably question whether those changes affect the findings in the paper. In this section, I briefly describe important changes in the electoral environment, I discuss the extent to which these changes might influence the findings, and I outline the robustness checks that I implement to address potential concerns.

Are changes in the electorate a cause for concern? Over the course of the studied period, the electorate grew considerably, in part driven by population growth and in part by three franchise extensions. In 1918 voting rights were extended to all men over the age of 21 and women over the age of 30, in 1928 women over the age of 21 were allowed to vote, and in 1969 the voting age was reduced to 18 years of age.

While changes in the size of the electorate are not necessarily cause for concern per se, there might be reason to worry if they differentially affected boroughs and counties. In Figure 4, I illustrate the development in the size of the electorate for boroughs and counties, respectively. Overall, the electorate in the median county and borough follow roughly similar trends, but they are by no means perfectly parallel. For example, the major franchise extension in 1918 expanded the electorate slightly more in boroughs than in counties—the same year that the permitted spending was reduced more in counties than boroughs. Some of the results are sensitive to whether one controls for the size of the electorate, and this suggests that the parallel trends in the simple difference-in-difference setup may be violated. This could be a cause for concern, and one should be cautious and keep this in mind when interpreting the findings.

As mentioned above, the design relaxes the standard common-trends assumption with respect to changes in the size of electorate by flexibly controlling for the number of electors. This will address most of the concerns raised above. However, one might still worry that the electoral reforms differentially affected the composition of the electorate in boroughs and counties in a way that influences electoral competition. To ensure that this is not driving the findings, I show in the appendix that the results are robust when I exclude variation from spending-limit reforms that coincide with either of the three franchise extensions.

Are changes in constituency boundaries a cause for concern? Constituency boundaries were redrawn on multiple occasions throughout the studied period, but even though some reforms redrew a majority of the constituencies, none of them affected all constituencies at the same time.[17] The changes in constituency boundaries do not affect the within-constituency estimates because they are based on variation from the unreformed constituencies.

Are changes in election-deposit rules a cause for concern? Since 1918 parliamentary candidates had to pay a deposit when they submitted their nomination papers. The deposit was refunded if the candidate polled more than a certain percentage of the valid votes, otherwise it would go to the Treasury. From 1918 to 1985, the deposit was £150 and the threshold for refunding was 12.5%. In 1985 the deposit was increased to £500 and the threshold reduced to 5%. While the deposit presumably deterred certain candidates from entering, the same rules always applied to all constituencies. Consequently, changes in deposits will be washed out by the time-fixed effects. As an additional robustness check, I show in the appendix that the results are robust when I adjust for the number of candidates who lost their deposit in the previous election.

A more general issue is whether one should be concerned about strategic reforms of the spending-limit formula. It is reasonable to think that modifications of the formula might be motivated, at least in part, by reelection concerns of MPs and parties in government. While spending-limit reforms designed to benefit MPs or members of a governing party are not necessarily cause for concern in itself, it could be problematic if a reform was implemented as a strategic response to changes in the electoral environment that differentially affected borough and county constituencies.

Suppose, for example, that urbanization increased electoral competition in boroughs but not in counties and that MPs in response implemented a reform that increased the permitted campaign spending in boroughs but did not do so in counties. Using the design outlined above, one would detect a positive effect—even if the true effect was zero. In this scenario, changes in electoral competition in one type of constituency lead MPs to implement a reform that exclusively affects the spending limit in this constituency type. One could think of this as a concern about reversed causality.

While constituency-fixed effects will address some of these concerns, one might still worry about reversed causality of the nature described above. However, this could presumably be detected by examining the pre- and post-treatment trends. If MPs are responding to observable changes in their electoral environments, this will be picked up when one includes leads and lags on the spending-limit variable in the regression. The analyses of the leads and lags in the next section do not suggest that the effects are driven by this type of strategic behavior. Further, to the extent that reforms were implemented as a strategic response to changes in the electoral environment that follows a somewhat linear path, the concerns could be addressed using constituency-specific linear trends. In the appendix, I show that the results are robust when I augment the models with constituency-specific linear trends. To address issues related to constituency marginality, I show, in the appendix, that the results are robust when I control for electoral competition in the previous election, and I also show how the estimated effects vary across different levels of competitiveness.

[17] The major changes were implemented in 1918, 1944, 1948, 1974, 1983, 1997, 2001, 2005, and 2010.

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TABLE 2. Spending Increases when Spending Limits Are Increased

	Spending			
Spending limit (£10,000)	6,406.35 (104.31)	5,634.29 (142.16)	5,451.32 (381.28)	5,350.03 (727.88)
Observations	21,282	21,282	21,282	21,282
Constituencies	3,853	3,853	3,853	3,853
$\phi Electors_{it}$		✓		
$\lambda County_i$		✓	✓	
$\psi Electors_{it} \times County_i$		✓	✓	✓
δ_t			✓	✓
$\gamma_t Electors$			✓	✓
α_i				✓

Note: All models are estimated using OLS. Robust standard errors are clustered on constituencies and are reported in parentheses.

RESULTS: LOOSE SPENDING LIMITS DIMINISH ELECTORAL COMPETITION

In the subsequent subsections, I document three electoral consequences of higher spending limits. First, campaigns become more expensive, which is primarily driven by spending on advertisement and mainly disadvantageous to Labour candidates. Second, fewer candidates run for office and elections become less competitive. Third, the financial and electoral advantages enjoyed by incumbents are magnified.

Loose Spending Limits Increase the Cost of Campaigns

In this section, I examine how spending limits affect the level and type of campaign spending. Table 2 presents the main results. In the first column, I present the simple pooled, cross-sectional association between level of permitted spending and spending by the average candidate in a race. In the second column, I control for the three formula inputs. In the third column, I further control for changes in formula coefficients affecting all constituencies. In the fourth column, I add constituency-fixed effects so the estimates are based on within-constituency variation.

Across all specifications, the estimated effect is positive and statistically significant, suggesting that the average candidate spends more money when spending limits are increased. On average, a £1 increase in the spending limit leads to an increase of approximately 55 pence in spending. Equivalently, each time over the course of the twentieth century that the permitted spending has been reduced by £1, candidates have decreased their actual spending by approximately 55 pence.

Next, I examine the pre- and post-treatment effects. I augment the model presented in the final column of Table 2 with two leads and two lags of the spending limits variable, and I plot these estimates in Figure 7. The estimated coefficients on both leads and lags are relatively small in magnitude and statistically insignificant, lending support to the causal interpretation of the increase in campaign spending.

To unpack how spending limits affect the electoral campaigns, I estimate the effect of spending limits on different spending categories and report these results in Figure 8. I estimate Equation 5 for each spending outcome and include a lead on the spending limits variable to test for pretreatment trends. In general, the spending limit at time t+1 does not predict spending at time t, but it is worth noting that one of the pretreatment coefficients (agents at time t+1) appears to be statistically significant. The results show that candidates primarily increase their spending on advertisement when spending limits are relaxed.[18]

Presumably, spending limits will affect the behavior of some individuals more than others, and this heterogeneity is not revealed in the constituency-level analyses discussed above. To unpack how individual candidates respond to changes in the spending limits they face, I implement a simple individual-level difference-in-difference design and estimate how the sensitivity to spending limits varies across parties. The idea is to compare the same individual before and after a change in the spending limit while differencing out general trends in the performance of their party. More specifically, I estimate equations of the following form using OLS:

$$\begin{aligned} Y_{jit} \;=\; & \beta_1 Spending\ Limit_{it} + \\ & \beta_2 Spending\ Limit_{it} \times Labour_{jit} + \\ & \beta_3 Spending\ Limit_{it} \times Liberal_{jit} + \\ & \beta_4 Spending\ Limit_{it} \times Other_{jit} + \\ & \alpha_j + \delta_t + \varepsilon_{jit}, \end{aligned} \tag{6}$$

where Y_{jit} represents candidate j's level of spending (or spending share, or vote share) in constituency i at time t; $Labour_{jit}$, $Liberal_{jit}$, and $Other_{jit}$ are dummies indicating whether candidate j was a member of the Labour party, the Liberal (Dem.) party, or one of the minor parties, respectively;[19] and α_j and δ_t represent candidate and party-by-election fixed effects,

[18] When interpreting this finding, it is worth noting that the rate of inflation of course may vary across different types of expenditure.
[19] Note that the Conservative party is the excluded category.

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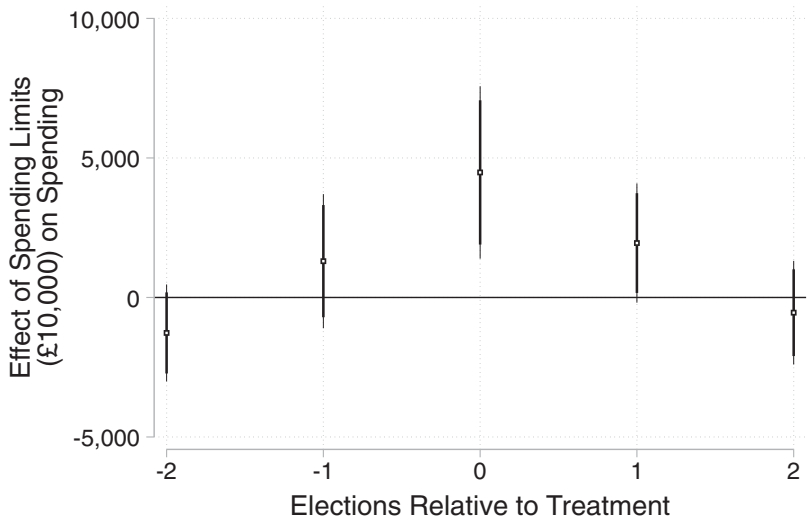
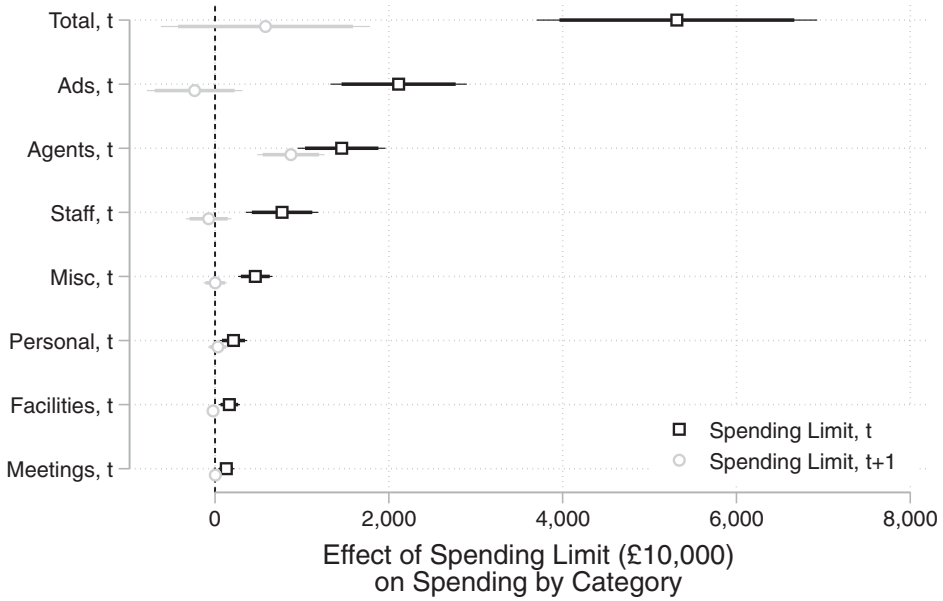
FIGURE 7. Spending Increases when Spending Limits Are Increased



Note: The plot reports pre- and post-treatment effects by estimating models of the following form using OLS: $Y_{it} = \sum_{\tau=-2}^{2} \beta_\tau Spending\ Limit_{i,t-\tau} + \alpha_i + \delta_t + \gamma_t Electors_{it} + \psi County_i \times Electors_{it} + \varepsilon_{it}$.

FIGURE 8. When Spending Limits Are Increased, Campaigns Become More Expensive, Primarily due to Increased Spending on Advertisement



Note: For each spending outcome, I estimate the following model: $Y_{it} = \beta_1 Spending\ Limit_{it} + \beta_2 Spending\ Limit_{i,t+1} + \alpha_i + \psi County_i \times Electors_{it} + \delta_t + \gamma_t Electors_{it} + \varepsilon_{it}$.

respectively. The coefficient β_1 captures the average effect of spending limits for Conservative candidates, and β_2, β_3, and β_4 capture the effect relative to the Conservative party for candidates from each of the other parties. These findings are presented in Table 3.

The results suggest that on average candidates from all parties increase their spending when spending limits are increased, but Conservative candidates increase their spending at a higher rate than do candidates from other parties. The results in columns two and three suggest that the spending advantage enjoyed by Conservative candidates translates into a higher share of total spending and a higher share of the votes. Relative to the Conservative party, Labour party candidates appear to be systematically disadvantaged when the level of permitted spending is increased. On average, Labour candidates respond to a £ 10,000 increase in the spending limit by increasing their spending by almost

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TABLE 3. Candidate-Level Difference-in-Differences by Party

	Spending	% Spending	% Votes
Spending limit (£10,000)	5,807.52	0.38	0.22
	(328.57)	(0.15)	(0.14)
Spending limit (£10,000) × Labour	–3,967.23	–1.15	–1.21
	(474.07)	(0.27)	(0.28)
Spending limit (£10,000) × Liberal (Dem.)	–361.18	–0.30	0.06
	(473.53)	(0.18)	(0.19)
Spending limit (£10,000) × Other	–1,232.39	–0.45	–0.12
	(802.09)	(0.34)	(0.32)
Observations	70,536	70,362	72,108
α_j	✓	✓	✓
δ_t	✓	✓	✓

Note: All models are estimated using OLS. Robust standard errors are clustered on constituencies and are reported in parentheses.

£4,000 less than do Conservative candidates, and this translates into more than a 1-percentage-point drop in their share of spending and votes, respectively.

The analysis conducted at the individual level studies how candidates modify their behavior in response to changes in the level of permitted spending, but some candidates will presumably anticipate that they cannot raise and spend as much money as the highest-spending candidates and strategically withdraw from the candidate pool when spending limits are increased. I analyze this effect in the next subsection.

In the appendix I show that the findings in this section are robust and qualitatively similar overall when the design is modified using alternative specifications (e.g., region-by-year fixed effects, constituency-specific linear trends, controlling for previous competitiveness, linear-log specifications, alternative constituency identifiers) or is implemented on alternative subsamples (excluding variation from formula reforms that coincide with other major electoral reforms). In the appendix, I also examine the heterogeneity in the treatment effect and show how the effect of spending limits varies relatively little across different levels of competitiveness.

Loose Spending Limits Reduce the Size of the Candidate Pool

I start by graphically illustrating the effect of spending limits on candidate entry in Figure 9. I estimate Equation 5 and include leads and lags of the spending limit to examine the pre- and post-treatment trends. The estimated coefficients on the upstream and downstream spending limits are relatively close to zero and statistically insignificant. Once the treatment kicks in, however, the effect is negative and statistically significant.

In Table 4, I present the results from the statistical analyses and show that the overall effect is very similar for the three measures of candidate entry. The first panel in the table reports the estimated effect on the number of candidates. Across all the specifications, the estimated effects are negative and statistically significant. On average, a £10,000 increase in spending limits approximately causes one out of twenty candidates to drop out.

In the second and third panels, I report the effect on the effective candidates and the effective spenders, respectively. Again, the estimated effects are negative and approximately of the same magnitude as the effect on the raw count of candidates. This suggests that the drop in the number of candidates is not purely driven by unviable third-party candidates who decide not to run. Higher levels of permitted spending appear to curb competition and promote a concentration of money and votes on fewer candidates.

In the appendix, I show that the findings in this section are fairly robust and qualitatively similar overall when I implement alternative specifications (e.g., region-by-year fixed effects, constituency-specific linear trends, controlling for previous competitiveness, linear-log specifications, alternative constituency identifiers) or base the analyses on alternative subsamples (e.g., excluding variation from formula reforms that coincide with other major electoral reforms). However, the estimates do vary and are somewhat sensitive to excluding the variation from the reform in 1948, and the estimates are not robust if one does not control for the number of electors. In the appendix, I also examine the heterogeneity in the treatment effect. The effect of spending limits varies relatively little across different levels of competitiveness.

In the next subsection, I examine how the reduced electoral competition differentially affects incumbents and challengers.

Loose Spending Limits Amplify Incumbency Advantages

In Figure 10, I examine how spending limits affect the vote share of the incumbent. In the pretreatment period, the estimated effects are very close to zero and statistically insignificant. Once the treatment kicks in, however, the estimates suggest that incumbents experience a substantial increase in their percentage of the votes.

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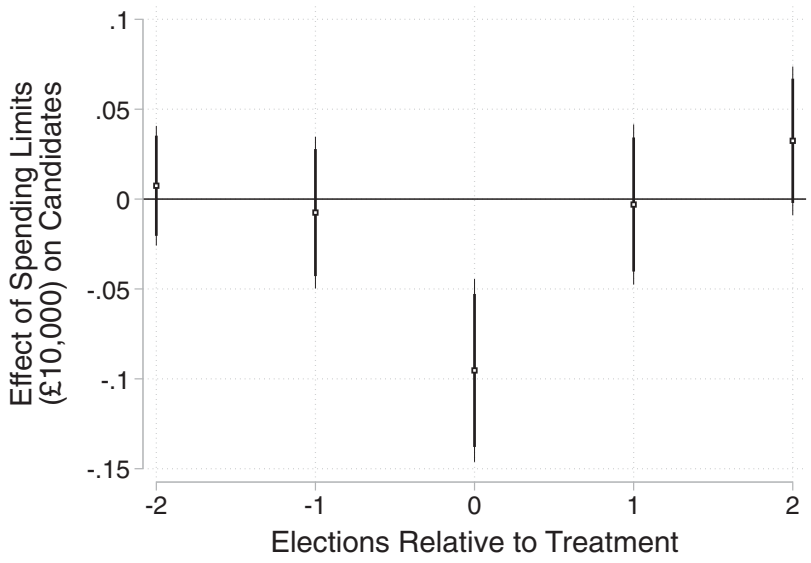
FIGURE 9. Fewer Candidates Run for Office when Spending Limits Are Increased



Note: The plot reports pre- and post-treatment effects by estimating models of the following form using OLS: $Y_{it} = \sum_{\tau=-2}^{2} \beta_\tau Spending\ Limit_{i,t-\tau} + \alpha_i + \delta_t + \gamma_t Electors_{it} + \psi County_i \times Electors_{it} + \varepsilon_{it}$.

TABLE 4. Fewer Candidates Run for Office when Spending Limits Are Increased

	Candidates			
Spending limit	−0.17	−0.09	−0.08	−0.05
(£10,000)	(0.00)	(0.00)	(0.01)	(0.01)
Observations	21,282	21,282	21,282	21,282
Constituencies	3,853	3,853	3,853	3,853
	Effective candidates			
Spending limit	−0.05	−0.02	−0.08	−0.04
(£10,000)	(0.00)	(0.00)	(0.01)	(0.01)
Observations	21,282	21,282	21,282	21,282
Constituencies	3,853	3,853	3,853	3,853
	Effective spenders			
Spending limit	−0.07	−0.05	−0.08	−0.04
(£10,000)	(0.00)	(0.00)	(0.01)	(0.01)
Observations	21,249	21,249	21,249	21,249
Constituencies	3,853	3,853	3,853	3,853
$\phi Electors_{it}$		✓		
$\lambda County_i$		✓	✓	
$\psi Electors_{it} \times County_i$		✓	✓	✓
δ_t			✓	✓
$\gamma_t Electors$			✓	✓
α_i				✓

Note: All models are estimated using OLS. Robust standard errors are clustered on constituencies and are reported in parentheses.

This finding can also be seen from the statistical analyses presented in Table 5. In this table, I conduct a constituency-level analysis of the effect of spending limits on incumbents' share of votes and campaign finance. The results presented in the first panel show how spending limits affect incumbents' vote shares. Across all specifications, the effects are positive and statistically significant. On average, a £10,000 increase in the level of permitted spending approximately leads to a 0.75-percentage-point increase in incumbents' percentage of the votes. Equivalently, when the spending limits over the course of the twentieth century were

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TABLE 5. Incumbents Perform Better when Spending Limits Are Increased

	Incumbent vote %			
Spending limit (£10,000)	0.78 (0.05)	0.40 (0.07)	0.63 (0.25)	0.77 (0.36)
Observations	15,098	15,098	15,098	15,098
Constituencies	3,682	3,682	3,682	3,682
	Incumbent spending %			
Spending limit (£10,000)	1.17 (0.05)	0.90 (0.08)	0.59 (0.25)	0.72 (0.42)
Observations	15,098	15,098	15,098	15,098
Constituencies	3,682	3,682	3,682	3,682
$\phi Electors_{it}$		✓		
$\lambda County_i$		✓	✓	
$\psi Electors_{it} \times County_i$		✓	✓	✓
δ_t			✓	✓
$\gamma_t electors$			✓	✓
α_i				✓

Note: All models are estimated using OLS. Robust standard errors are clustered on constituencies and are reported in parentheses.

tightened by £1,000, incumbents experienced approximately a 0.075-percentage-point drop in their share of the votes.[20]

In the next panel, I show how spending limits affect incumbents' share of campaign spending. Again, the estimated effects are positive and statistically significant across most specifications, suggesting that incumbents benefit financially when spending limits are increased.

An increase in the incumbent's share of the votes is, by construction, equivalent to a decrease in the aggregate vote share of all challengers. However, it may vary across challengers, and I examine this in the appendix. These results indicate that the front-runner among the challengers experiences a decrease in their vote share which, in absolute terms, is greater than the increase in the incumbent's vote share, suggesting that challengers are not equally harmed by higher levels of permitted spending.

An alternative approach is to evaluate the extent to which spending limits benefit incumbents by estimating the heterogeneity in the incumbency advantage across different levels of permitted spending. In the previous analyses, the unit of observation was a constituency in a given election, but in this analysis each row in the dataset is uniquely identified by a candidate, j, in a given constituency, i, in a given general election, t. I estimate the incumbency advantage employing a simple difference-in-differences design. In particular, I compare the performance of a candidate in a given constituency before and after winning the seat while differencing out common shocks affecting the party in a particular general election. I then interact the incumbency dummy with the spending limit to examine whether the incumbency advantage is correlated with the level of permitted spending. The following baseline model is estimated using OLS:

$$\begin{aligned} Y_{jit} &= \beta_1 Incumbent_{jit} + \beta_2 Spending\ Limit_{it} \\ &\quad + \beta_3 Incumbent_{jit} \times Spending\ Limit_{it} \\ &\quad + \alpha_j + \delta_t + \varepsilon_{jit}, \end{aligned} \tag{7}$$

where Y_{jit} represents the vote or spending share of candidate j in constituency i at time t, $Incumbent_{jit}$ is a dummy indicating whether the candidate ran as the incumbent in constituency i in election t, α_j represents candidate fixed effects, and δ_t represents party-by-election fixed effects. The key coefficient of interest is β_3, which reflects whether the incumbency advantage covaries with the level of permitted spending.

These results are presented in Table 6. In columns 1 and 3, I report the average financial and electoral incumbency advantages, respectively. On average, when a candidate controls a parliamentary seat, they approximately enjoy a 2-percentage-point increase in their share of campaign finance. The electoral incumbency advantage is approximately 3.5 percentage points.

In columns 2 and 4, I show how the incumbency advantage correlates with the level of permitted spending. The positive coefficient on the interaction terms suggests that both the financial and electoral incumbency advantages are positively correlated with the level of permitted spending. When spending limits are increased by £10,000, the financial and electoral incumbency advantages increase by approximately 0.2 percentage points. This finding is consistent with the idea that incumbency status reduces the cost of fundraising for candidates and that this translates into improved electoral performance when spending limits are relaxed.

In the appendix, I show that the incumbency findings in this section are relatively robust overall when the

[20] The associations between permitted spending and incumbent performance reported in Figure 2 suggest that these associations are relatively well approximated by a simple linear fit.

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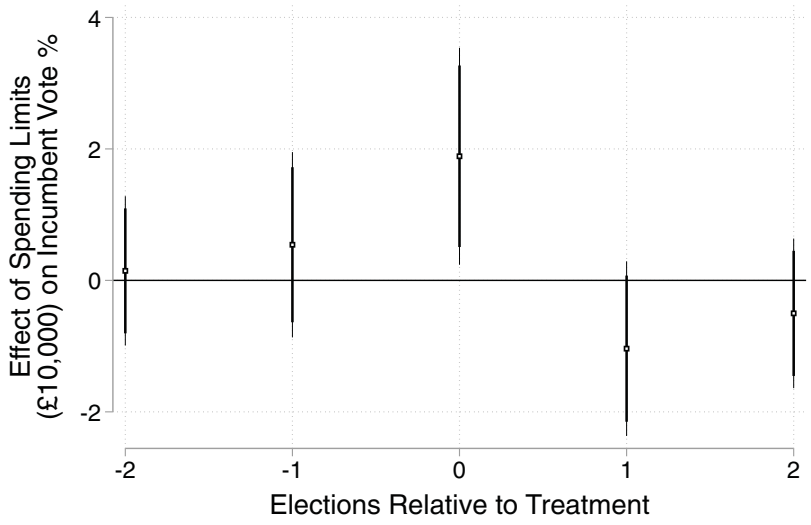
TABLE 6. Financial and Electoral Incumbency Advantages Are Amplified when Spending Limits Are Increased

	% Spending		% Votes	
Incumbent	2.24	1.10	3.57	2.73
	(0.23)	(0.33)	(0.21)	(0.29)
Incumbent × spending limit (£10,000)		0.23		0.19
		(0.06)		(0.05)
Spending limit (£10,000)		0.00		0.02
		(0.09)		(0.09)
Observations	70,651	70,362	72,425	72,108
α_j	✓	✓	✓	✓
δ_t	✓	✓	✓	✓

Note: All models are estimated using OLS. Robust standard errors are clustered on constituencies and are reported in parentheses.

FIGURE 10. Incumbent Vote Shares Increase when Spending Limits Are Relaxed



Note: The plot reports pre- and post-treatment effects by estimating models of the following form using OLS: $Y_{it} = \sum_{\tau=-2}^{2} \beta_\tau Spending\ Limit_{i,t-\tau} + \alpha_i + \delta_t + \gamma_t Electors_{it} + \psi County_i \times Electors_{it} + \varepsilon_{it}$.

design is modified using alternative specifications (e.g., region-by-year fixed effects, constituency-specific linear trends, controlling for previous competitiveness, linear-log specifications) or is implemented on alternative subsamples (e.g., excluding variation from formula reforms that coincide with other major electoral reforms). Some of the constituency-level estimates appear to be somewhat sensitive to excluding variation from the reforms in 1928 and 1948, as well as not controlling for the number of electors. In the appendix, I also examine the heterogeneity in the treatment effect and show how the effect of spending limits varies relatively little across different levels of competitiveness.

CONCLUSION

Based on new data, this paper documents the campaign spending of UK House of Commons candidates from 1885 to 2019 and studies how campaign spending limits affected these elections. The paper exploits variation induced by reforms of the spending-limit formula that affect some but not all constituencies. Overall, the findings indicate that loose campaign spending limits make elections less competitive. When spending limits are increased, campaigns become more expensive, which is primarily driven by spending on advertisement and mainly disadvantageous to Labour party candidates; the pool of candidates shrinks and elections become less competitive; and the financial and electoral incumbency advantages are amplified. These findings suggest that the overall tightening of spending limits over the course of the twentieth century may have stimulated electoral competition and modified the advantages enjoyed by members of parliament.

What are the normative implications of these findings? From the perspective of the candidates, the finding suggests that higher spending limits may shift

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welfare from challengers to incumbents. From the perspective of the voters, however, the welfare implications are ambiguous without additional assumptions. On one hand, higher spending limits may strengthen electoral selection. If the ability of politicians matters for aggregate welfare, and high-ability candidates find it easier to fundraise, then higher spending limits might be welfare improving. On the other hand, if candidates who are more aligned with monied interests find it easier to fundraise, then higher spending limits may tilt electoral selection in their favor to the disadvantage of broader groups in society.

More generally, the findings shed new light on the role of money in politics. Scholars have long puzzled to understand why there is so little money in politics (Ansolabehere, de Figueiredo, and Snyder 2003), and one answer to this puzzling question, motivated by the findings in this paper, could be that the potential threat of campaign spending may shape the political process more than previously believed. Spending limits allow us to jointly study actual spending and potential spending threats, and the results in this paper indicate that the joint effect substantially influences elections. Money may matter, even when candidates do not spend a penny.

SUPPLEMENTARY MATERIALS

To view supplementary material for this article, please visit http://dx.doi.org/10.1017/S0003055420001008.

Replication materials can be found on Dataverse at: https://doi.org/10.7910/DVN/AP0DHP.

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