
The Effects of Election Advertising Spending and Incumbency on the General Election Results in Great Britain: Critical Study

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ABSTRACT

This paper attempts to estimate the effect of campaign advertising expenditures on vote outcomes in Great Britain's general election over 1992-2001. It uses an empirical method to estimate the impact of electoral campaign expenditures on votes, but also attempts to develop a signaling model in the election by estimating the relationship between campaign spending and quality signaling through incumbency status.

Specifically, this paper examines an empirical analysis of the impact of campaign expenditures on votes cast in the general elections in Great Britain. It extends Lee [1] to incorporate the incumbency and interactive effect. First, it includes candidate and party incumbency status into the benchmark model so as to estimate *incumbency* effects. Second, it includes an interaction term between candidate incumbency and candidate spending to estimate *interactive* effects. The main features of the estimation model are to assess the impact of campaign expenditures on votes by estimating incumbency and interactive effects on votes.

Keywords: Campaign advertising spending; election; incumbency effect; interactive effect.

JEL Classifications: C31, D70, D72.

1. INTRODUCTION

The high campaign expenditure levels between political parties in recent British general elections have produced the popular view that *money can buy votes and elections*. In election competition with campaign advertising, candidates use campaign advertising to provide information on their positions on the policy issues or on the candidate quality or party quality in an attempt to attract votes.

Most of the existing empirical studies deal with the election competition with campaign advertising expenditures between incumbents and their challengers. One class of the empirical literature indicates that campaign spending by incumbents has a negligible or even perverse effect on their votes gained. The other type of empirical studies shows that incumbent expenditures have a positive and significant effect on votes in the reelection campaign of incumbents, particularly in the U.S. Senate election.

The incumbent expenditure effects are still a subject of controversy. The effect as to whether the marginal product of incumbent spending is positive, zero or negative is apparently not resolved, in the context of U.S. congressional elections¹ [2]. A tentative conclusion tells us that the incumbents' marginal product of campaign spending on votes is lower than that of challengers. This is due to the fact that the incumbent is already known and appreciated by a substantial number of voters in his constituency.

¹ For example, see Green and Krasno [3,4] and Jacobson [5].

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The use of election result data enables us to examine the relationship between candidate's expenditures and vote shares they won in the election. Therefore, the empirical investigation can utilize a large cross-sectional sample of observations of the same product, or candidates. I attempt to account for the variation in the vote for an individual candidate by regressing his share of votes cast on his campaign expenditures, the campaign expenditures of his rivals, his incumbency status, and borough dummy variable by using aggregate cross-sectional data from the British general elections.

I attempt to examine an empirical analysis of the impact of campaign expenditures on votes cast in three general elections in Great Britain. Lee [1] estimated a simple linear estimation model and a simple quadratic model. We call this a benchmark case. Now, I extend Lee [1] by incorporating two new aspects. First, I include an incumbency status into the benchmark model so as to estimate incumbency effect: an incumbency estimation model. Second, I estimate an interaction effect between candidate's incumbency and incumbent's spending: An interaction estimation model.

This paper will proceed as follows. Section 2 describes the vote estimation model. In sections 3 and 4, I present the estimation results for the incumbency and interaction estimation models, respectively. Finally, the summary and conclusion are presented in section 5.

2. MODEL FOR ESTIMATION

Electoral competition in our model is between three political parties: Labour, Conservative and Liberal Democrats in Great Britain. Each candidate in a given constituency is either an incumbent or a challenger. Based on Downs's and Stigler's analyses, each candidate seeks to maximize votes with available resources. Campaign advertising that provides information on the candidates' policy position or their personal quality is used to attract votes or voters. Thus, electoral competitors are assumed to allocate campaign expenditures efficiently in order to attract the most votes possible with their funds² [6].

In our analysis, the two terms, campaign expenditures and campaign advertising, are used interchangeably. Advertising is the process of bringing something to the public's attention through publications or broadcasting. Campaign expenditures of all types are aimed at presenting the candidate to the voters. A significant portion of campaign expenditures are spent on broadcasting and private messages. Therefore, it supposes that campaign expenditures are equivalent to campaign advertising expenses. In particular, in British election context, the campaign advertising expenses represent printing costs incurred during the election.

The estimation model is structured to examine the relationship between candidates' campaign expenditures and their votes. I make two basic assumptions: non-simultaneity of the relationship between money and votes, and no reactive spending between candidates. First, I assume that there is no simultaneous relationship between votes and campaign expenditures in our model. It rules out the possibility that there exists a feedback or simultaneous relation between votes and expenditures. British parliamentary elections and Canadian provincial elections are in many respects different from U.S. House and Senate elections. The potential degree of feedback or simultaneity between votes and expenditures for individual candidates is unlikely to be strong in Canada and Great Britain. In British parliamentary elections (along with Canadian provincial elections), the simultaneous relation between votes and expenditures is likely to be less prominent due to institutional arrangements: e.g., a short duration of the election campaign. For example, in Great Britain and Canada, election campaigns rarely exceed six weeks and the amount of expenditures is largely determined for each candidate shortly after the election is proclaimed. Thus, I assume in this model that the decision on candidates' expenditures is independent of the votes they receive.

Second, we will make no reactive spending assumption between candidates: I assume that candidate's own expenditures and opponents' expenditures are independently chosen. That is, there is no mutually reactive relation between candidates' expenditures. I suppose that opponents'

²This is analogous to the use of advertising by firms to supply product information to potential customers in order to promote sales.

expenditures are unlikely to influence on a given candidate's decision on how much to spend. The rational candidate does not react to the levels of campaign expenditures of opponents. There are a variety of factors inhibiting a candidate from responding to their opponents: for example, the short period of the electoral campaign, the inability to spend additional campaign funds effectively on such a short election campaign, and the inability to raise additional campaign funds. In British and Canadian parliamentary elections, the ruling party has discretion only as to when an election is announced, and the relatively short duration of the election campaign will hinder candidates from responding to their opponents' expenditures.

Based on the assumptions described above, I examine the shape of a voting-demand model for a candidate. I employ the economic demand model to approach the political campaign activity and electoral process. Now, I formulate the estimation model based on the three party candidates³ [7] and estimate by using OLS techniques. In particular, I include party and candidate incumbency status, and ministerial dummy variables as independent variables in the voting equation.

I will explain a general model specification. The voting equations for each party take the following functional form:

$$VTS_j^i = f(AE_i, AE_k, AE_i^2, AE_k^2, PI_i, CI_i, CM_i, INT_i, BOR_j)$$

where i denotes the candidate chosen by each party, k denotes opponent candidates, $i \neq k$, and j represents constituency. The variables used in the equation are defined as follows.

First, VTS_j^i is the dependent variable and represents the vote shares, or vote percentage, received by the candidate i of each party in a given constituency j . AE_i and AE_k variables represent candidate i 's own advertising expenditure per capita (pence) and challenger k 's advertising expenditures per capita (pence), respectively⁴ [8]. In our case, AE_k can be further decomposed into two separate terms to account for two major opponents run in each constituency. AE_i^2 is the squared advertising expenses and included to account for the diminishing returns to campaign expenditures. Note that AE_k is included to evaluate explicitly the effect of challengers' campaign spending on the vote results. The major goal in this section is to assess the influence of campaign expenditures on voting outcomes, other things being equal. We expect a positive effect of own expenditure and a negative effect of challengers' campaign expenditures on votes received.

Second, the incumbency status, representing the *candidate-specific* and *party-specific* characteristics, is one of the most important factors to influence votes received. Incumbents are expected to receive more votes than challengers, other things being equal, due to their opportunities to obtain rewards for their constituencies in addition to their media exposure advantages. Even stronger effects might be expected for incumbents who held high offices in the previous government such as being cabinet ministers or playing prominent roles in important parliamentary committees. Now, PI captures *party incumbency status* to account for party-specific characteristic such as party policy and party affiliation. PI is a dummy variable denoting party incumbency status, which equals one if a party is the incumbent party and equals zero otherwise. On the other hand, CI captures *candidate incumbency status* to account for candidate-specific characteristic (or 'candidate quality') of the candidate. CI is a dummy variable denoting candidate incumbency status, which equals one if a candidate is the incumbent and equals zero otherwise. Finally, CM represents the *cabinet ministerial status* of candidates in the outgoing government. CM is a dummy variable denoting candidate's cabinet

³Chapman and Palda [7] also formulate the estimation model based on the three party candidates and estimate by using OLS and 3SLS techniques.

⁴Note that AE_i and AE_k variables are expressed by a deflated or relative form. These may be augmented by party headquarters' advertising outlays. This is available only for 2001 election in Great Britain.

ministerial status in the previous government, which equals one if a candidate in an electoral constituency was a cabinet minister in the previous government and equals zero otherwise.

Finally, INT_i represents an *interactive* or *multiplicative effect* between independent variables. In particular, I take into account an interactive effect between incumbency status and incumbent's expenditure: $_PI \cdot _A$. Also, I include only a *borough* dummy variable BOR_j to measure a constituency-specific characteristic, and use it to estimate the effect of borough constituency on votes: whether a constituency is a county or borough area⁵ [9].

Based on this economic model, Lee [1] attempts to estimate *simple* linear and quadratic models, which *exclude* incumbency variables, to mainly show the effect of the campaign expenditures on votes. A simple linear model is to test the simple *vote-money* relationship, and a simple quadratic model is to test the *vote-money* and *its diminishing* relationship. According to the result of Lee [1], both simple linear and simple quadratic estimation equations for each candidate in all three parties showed that each candidate's own expenditure served to increase its vote share, but opponents' expenditures served to decrease its vote share. The coefficients on own LA , CA and LDA in each vote equation were all significant at the 1 percent level. In addition, the quadratic estimation equation displayed that the coefficients on LA^2 and CA^2 exhibited diminishing returns. But, the coefficient on LDA^2 did not exhibit diminishing returns, and was significant. As the OLS results show, the candidate's own expenditure has a positive significant influence on his votes, but the opponents' expenditures have a negative significant effect on his votes.

Two important advantages of our estimation formulation are that first, it allows each party to have its own voting equation. Thus, the coefficients of each variable in each vote equation may reflect 'party-specific differences'. These differential effects on the same variable between parties may be due to unequal skills with which the candidates and parties execute their campaigns or due to their various stands on policy issues. In addition, it is easy to compare and interpret each coefficient across parties. Second, this model suggests a competitive voting demand model in the sense that it includes challengers' advertising expenditures.

Now, I outline the estimation hypothesis. The estimation model predicts that incumbent candidates will have large advantages (i.e., incumbency effect) in an incumbency estimation model, and also incumbent candidates, when they spend more, will have inefficient vote outcome in an interactive estimation model⁶ [10].

Next, I turn to explain the estimation model specification. In the estimation model, votes and expenditures are used in both linear and quadratic form. The quadratic form is useful to show a tendency to decreasing returns to campaign expenditures. In particular, Palda [11] estimated the impact of expenditures on votes by using both linear and logarithmic form. Palda pointed out that the double-log regressions are likely to perform better in terms of R^2 . In addition, double-log regression model facilitates to show a tendency to decreasing returns to campaign expenditures.

The exact functional form of the 'expenditure - vote relation' is not pinned down by the existing literature. We can estimate four types of estimation models: (i) a simple linear estimation model, (ii) a simple quadratic estimation model, (iii) an incumbency estimation model, and (iv) an interactive estimation model. But the estimation model may be misspecified because important variables are omitted and thus resulting estimates become biased. I will first estimate an incumbency estimation model and then estimate an interaction estimation model.

For instance, I present an incumbency and an interaction estimation models for the case of Labour party candidates, respectively, as:

⁵For the description of data, refer to Lee [1].

⁶According to Lee [1], campaign expenditures affect the votes that candidates receive (i.e., the effect of campaign expenditures on votes) in a simple estimation model and also campaign expenditures exhibit diminishing returns (i.e., diminishing returns to expenditures) in a simple quadratic estimation model.

$$\begin{aligned}
 LabVTS_{ij}^t &= \alpha_0 + \alpha_1 \cdot LA_i + \alpha_2 \cdot CA_i + \alpha_3 \cdot LDA_i \\
 &\quad + \alpha_4 \cdot LA_i^2 + \alpha_5 \cdot CA_i^2 + \alpha_6 \cdot LDA_i^2 + \alpha_7 \cdot BOR_j \\
 &\quad + \alpha_8 \cdot LPI_i + \alpha_9 \cdot LCI_i + \alpha_{10} \cdot LCM_i \\
 LabVTS_{ij}^t &= \alpha_0 + \alpha_1 \cdot LA_i + \alpha_2 \cdot CA_i + \alpha_3 \cdot LDA_i \\
 &\quad + \alpha_4 \cdot LA_i^2 + \alpha_5 \cdot CA_i^2 + \alpha_6 \cdot LDA_i^2 + \alpha_7 \cdot BOR_j \\
 &\quad + \alpha_8 \cdot LPI_i + \alpha_9 \cdot LCI_i + \alpha_{10} \cdot LCM_i + \alpha_{11} \cdot LPI_i \times LA_i
 \end{aligned}$$

The first equation represents the incumbency estimation equation, and the second equation denotes the interaction estimation equation.

First of all, $LabVTS_{ij}$ is the dependent variable representing vote shares received by the Labour party candidates i at a given constituency j in a given general election t . In these equations, I choose vote shares as the dependent variable, rather than the vote number gained. The constant terms in each voting equation reflect the effect of party affiliation, as well as other factors, such as the past votes. LCI is a dummy variable denoting candidate incumbency status, LPI is a dummy variable representing party incumbency status, and LCM is a dummy variable denoting candidate's cabinet ministerial status in the previous government. The estimation equations above demonstrate how the campaign expenditure variables are treated operationally in the model. I include Labour's own expenditure, LA_i and two opponents' expenditures, CA_i and LDA_i . The squared expenditure terms of the Labour's expenditures, LA_i^2 , are included to account for diminishing returns to expenditures. BOR_j denotes the borough variable in the constituency j . Finally, I include $LPI_i \times LA_i$ to represent the interactive effect between party incumbency and incumbent's spending.

3. INCUMBENCY EFFECT ESTIMATION RESULTS

I attempt to estimate an *incumbency effect* by including incumbency variables into the benchmark model. The effect of spending by candidates can be underestimated or overestimated either because it is endogenous (simultaneous relation between expenditures and votes) or because the previous benchmark model has not been identified properly. The former justifies a two-stage least squares (TSLS) model, and the latter needs a properly identified model that accounts for new variables. I focus here on the latter issue. I modify the previous benchmark model by including new incumbency variables, party incumbency (PI) and candidate incumbency (CI).

First, the incumbency estimation models for three parties are represented as:

$$\begin{aligned}
 LabVTS_i^t &= \alpha_0 + \alpha_1 \cdot LA_i + \alpha_2 \cdot CA_i + \alpha_3 \cdot LDA_i + \alpha_4 \cdot LA_i^2 + \alpha_5 \cdot CA_i^2 + \alpha_6 \cdot LDA_i^2 \\
 &\quad + \alpha_7 \cdot BOR_j + \alpha_8 \cdot LPI_i + \alpha_9 \cdot LCI_i + \alpha_{10} \cdot LCM_i \\
 ConVTS_i^t &= \alpha_0 + \alpha_1 \cdot LA_i + \alpha_2 \cdot CA_i + \alpha_3 \cdot LDA_i + \alpha_4 \cdot LA_i^2 + \alpha_5 \cdot CA_i^2 + \alpha_6 \cdot LDA_i^2 \\
 &\quad + \alpha_7 \cdot BOR_j + \alpha_8 \cdot CPI_i + \alpha_9 \cdot CCI_i + \alpha_{10} \cdot CCM_i \\
 LDVTS_i^t &= \alpha_0 + \alpha_1 \cdot LA_i + \alpha_2 \cdot CA_i + \alpha_3 \cdot LDA_i + \alpha_4 \cdot LA_i^2 + \alpha_5 \cdot CA_i^2 + \alpha_6 \cdot LDA_i^2 \\
 &\quad + \alpha_7 \cdot BOR_j + \alpha_8 \cdot LDPI_i + \alpha_9 \cdot LDPI_i
 \end{aligned}$$

where $_PI$, $_CI$ and $_CM$ respectively denote party incumbency, candidate incumbency status and cabinet ministerial position.

All the models have been estimated by ordinary least squares (OLS) regression. Then, I report the incumbency estimation results for the 2001 election. First, the incumbency estimation result for the governing Labour party candidates in the 2001 election is represented as:

$$\begin{aligned}
 LabVTS_i^{2001} = & 39.7932 + 1.07676 \cdot LA - 1.67193 \cdot CA - 1.28428 \cdot LDA \\
 & - 0.04756 \cdot LA^2 + 0.04529 \cdot CA^2 + 0.00555 \cdot LDA^2 \\
 & + 2.29032 \cdot BOR + 18.8125 \cdot LPI + 0.50190 \cdot LCI \\
 & + 2.49968 \cdot LCM \quad (R^2 = 0.863) \\
 & \text{Standard errors: } (25.4)^{**}, (4.23)^{**}, (-4.76)^{**}, (-4.91)^{**}, (-3.53)^{**}, (1.86)^{**}, (0.286), (4.22)^{**}, (14.5)^{**}, (0.458), (3.21)^{**}
 \end{aligned}$$

The incumbency estimation result for the Labor candidates shows that the Labour's own expenditure, *LA*, serves to increase its vote share, but opponents' expenditures, *CA* and *LDA*, decrease the Labour's vote share. The coefficients on *LA*, *CA* and *LDA* are all significant at the 1 percent level. In addition, this shows that the coefficient on LA^2 exhibits diminishing returns which are significant at the 1 percent level.

Second, the Conservative party candidates' results in 2001 for the incumbency effect are given as:

$$\begin{aligned}
 ConVTS_i^{2001} = & 9.09848 + 0.28439 \cdot LA + 3.27839 \cdot CA + 0.05061 \cdot LDA \\
 & - 0.0313 \cdot LA^2 - 0.09216 \cdot CA^2 - 0.03498 \cdot LDA^2 \\
 & - 1.06482 \cdot BOR + 14.6481 \cdot CPI + 2.60627 \cdot CCI \\
 & \text{Standard errors: } (5.34)^{**}, (1.07), (8.46)^{**}, (0.174), (-2.15)^{**}, (-3.42)^{**}, (-1.59)^{*}, (-1.80)^{**}, (9.92)^{**}, (1.77)^{**}
 \end{aligned}$$

Finally, the Liberal Democrat party candidates' results in the 2001 election for incumbency effect are reported as:

$$\begin{aligned}
 LDVTS_i^{2001} = & 16.0656 - 1.12284 \cdot LA + 0.23674 \cdot CA + 1.75802 \cdot LDA \\
 & + 0.0312 \cdot LA^2 - 0.02559 \cdot CA^2 - 0.00222 \cdot LDA^2 \\
 & + 0.18572 \cdot BOR + 6.45996 \cdot LDPI + 10.2982 \cdot LDCI \\
 & \text{Standard errors: } (14.4)^{**}, (-6.76)^{**}, (0.939), (9.21)^{**}, (3.29)^{**}, (-1.45)^{*}, (-0.146), (0.485), (3.37)^{**}, (5.47)^{**}
 \end{aligned}$$

From these estimations, I summarize briefly the basic estimation results on own expenditure and squared expenditure effects as follows. First, the regression estimates show that there is significantly positive effect of own advertising expenditure and negative impact of opponents' expenditures on the votes each candidate obtains. In the case of the Labour party for 2001 election, for example, the *LA* coefficient implies that the Labour candidates spending 1 pence may increase, other things being equal, their vote shares by 1.08 percent. By contrast, the coefficients of *CA* and *LDA* in the *LabVTS* equation have negative signs which are statistically significant. That is, the coefficient for *CA* indicates that the Conservative candidates' expenditure of 1 pence will decrease the Labour candidate's vote share by 1.67 percent. In addition, the coefficient for *LDA* indicates that the expenditure of 1 pence by Liberal Democrat candidates will reduce the Labour candidate's vote share by 1.28 percent. Similarly, from the Conservative candidates' estimation equation, the coefficient for own *CA* means that the Conservative candidates spending 1 pence can increase, other things being equal, their vote shares by 3.28 percent. But, the coefficients of *LA* and *LDA* have positive signs but are not significant.

These results have three important implications. First, the Labour candidates, as a governing party in 2001, have *smaller* own expenditure effect than the Conservative and Liberal Democrat candidates. Thus, advertising expenditures are more productive for the Conservative and LD candidates (i.e., challengers) than the incumbent Labour candidates. Second, the Labour and Conservative candidates have *smaller* own expenditure effect after including *PI* and *CI*, but the Liberal Democrat candidates have *larger* own expenditure effect with *PI* and *CI* including. Thirdly, when *PI* and *CI* variables are included in the estimation, there is a relatively bigger difference between the coefficient of own *LA* for Labour candidates and the coefficient of own *CA* for Conservative candidates compared to the case without including *PI* and *CI* variables⁷ [3].

⁷With *PI* and *CI* excluding, the coefficient difference is $4.9780 \cdot CA - 3.7613 \cdot LA = 1.2167$, while, with *PI* and *CI* including, the difference is $3.2784 \cdot CA - 1.0768 \cdot LA = 2.2016$. Thus, the coefficient difference is increased after including *PI* and *CI* variables.

However, our result does not support the main finding of campaign spending literature that expenditures are more productive for challengers than for incumbents. For the 1992 and 2001 general elections, challenging-party (i.e., the Conservative party in 2001 and the Labour party in 1992) candidates have more productive, whereas incumbent-party candidates (i.e., the Conservative party in 1997) have more productive for the 1997 election. Thus, our OLS estimates will not support the standard expenditure effect that challengers are more productive than incumbents, in particular, for the 1997 election.

Second, candidate expenditure productivity may reach diminishing marginal returns as spending increases. The coefficients for LA^2 and CA^2 have negative signs which are statistically significant. This implies that expenditures from the Labour and Conservative candidates show the diminishing marginal returns. However, the coefficient of LDA^2 has a negative sign but are not significant. In particular, the coefficient of LDA^2 for 1992 has a *positive* sign which is significant. It implies that expenditure by the Liberal Democrat candidates does not show diminishing marginal returns (see Table 1).

Third, I found that opponent's spending has a substantial influence on the election outcomes. In each vote equation, some coefficients for opponent's expenditures have negative signs as we expected and are significant, while other coefficients for opponent's expenditures have positive signs, but not significant. The former implies that opponent's spending can decrease a given party's own vote shares. But, the latter implies that opponent's spending may increase a given party's vote shares.

Table 1. Own and diminishing expenditure effect in incumbency model

	LabVTS		ConVTS		LDVTS	
	LA	LA^2	CA	CA^2	LDA	LDA^2
1992	4.8184 (9.61)**	-0.2009 (-5.45)**	4.7686 ^{inc} (7.95)**	-0.2674 (-5.72)**	1.6225 (5.51)**	0.0594 (2.08)**
1997	3.6087 (8.98)**	-0.1259 (-5.30)**	3.8822 ^{inc} (8.10)**	-0.1999 (-5.63)**	1.8578 (7.50)**	0.0273 (1.32)
2001	1.0768 ^{inc} (4.23)**	-0.0476 (-3.53)**	3.2784 (8.46)**	-0.0922 (-3.42)**	1.7580 (9.21)**	-0.0022 (-0.146)

This table shows that, there is a significant positive relationship between candidate's own expenditures and its own vote shares in the incumbency estimation model for all three party candidates. In addition, it shows that there are decreasing returns to own advertising spending for the Labour and Conservative candidates, but *not* for the Liberal Democrat candidates.

Moreover, the Conservative candidates, the challenger in the 2001 election, start with *higher* productivity (i.e., $3.2784 \cdot CA$ versus $1.0768 \cdot LA$ in incumbency equation: the Conservative, or challenger, spending is more productive than the Labour spending) and decline faster than the Labour's (i.e., $-0.0922 \cdot CA^2$ versus $-0.0476 \cdot LA^2$). Similarly, the Liberal Democrat candidates, the challenger in 2001 election, start with higher productivity (i.e., $1.7580 \cdot LDA$ vs $1.0768 \cdot LA$: the Liberal Democrat, or another challenger, spending is more productive than the Labour spending), but decline slower than the Labour's (i.e., $-0.0022 \cdot LDA^2$ vs $-0.0476 \cdot LA^2$).

Finally, diminishing returns to spending turn out to apply more to LA and CA than to LDA . This indicates that the Liberal Democrat candidates are less susceptible to diminishing returns than the Labour and Conservative candidates. In particular, we observed a positive and significant sign for LDA^2 in 1992: that is, there is no evidence of diminishing marginal returns for the Liberal Democrat candidates in 1992. It is worth noting the possibility that diminishing returns may appear in LDA as well when the expenditures of Liberal Democrat candidates become very large. This may imply that few Liberal Democrat candidates spent to the point where the productivity of spending is decreased.

Now, I present the estimation results of incumbency effect. When PI and CI variables are included in the benchmark estimation model, both incumbency variables have a considerable positive effect on the votes. For the party incumbency (PI) case, the coefficients for LPI and CPI are positive and highly significant. The coefficient for LDPI is also positive and significant. The coefficients of LCI and CCI are small and not significant, but LDCI coefficient is large and highly significant.

Main empirical results from estimating the incumbency effect are as follows. First, LPI, CPI and LDPI for all 3 parties have a substantial direct positive effect on the vote. Second, LCI and CCI for Labour and Conservative have a trivial effect on the vote. Thirdly, LDCI for Liberal Democrat has a substantial direct effect on the Liberal Democrat vote share. Thus, candidates from the Labour and Conservative parties are benefited from the party incumbency status, while candidates from the Liberal Democrat party are benefited from the candidate incumbency status.

In turn, I interpret the incumbent effect based on the incumbent advantage. The incumbency dummy variables show that incumbency status, measured as party and candidate incumbency, starts with a significant built-in advantage over opponents or challenging candidates. Some part of this head start by incumbent candidates can be attributed to the *institutionalized campaign resources* available to incumbent candidates. For instance, paid staff, the franking privilege, and a television network are unpriced electoral assets for incumbent candidates. Other part of this advantage will be caused by 'quality effect'. In particular, party incumbency (PI) is likely to prove beneficial for the incumbent because of its importance in policy making and because it indicates 'brand loyalty' (or brand quality) to constituents. For example, party incumbency can increase brand loyalty if party incumbent candidates are able to deliver more public goods to their constituencies. On the other hand, party incumbency is a measure of voter certainty over the candidate's policy position. If voters are ill-informed due to the rational ignorance or policy illusion, they may use party incumbency to deduce a candidate's view on policy issue.

I now compare PI effect with CI effect results based on both a separated and an integrated estimation cases. First, in a separated estimation case, coefficients of LPI and CPI are greater than ones of LCI and CCI, respectively. This implies that the Labour and Conservative candidates are *party-centered*. But coefficient of LDPI is smaller than one of *LDCI*, and thus indicates that the Liberal Democrat is *candidate-centered*. Second, in an integrated estimation case, coefficients of LPI and CPI are all significant, but, LCI and CCI are not significant. Moreover, coefficients of LPI and CPI are larger than those of LCI and CCI, respectively. This signifies that LPI and CPI are dominating LCI and CCI, respectively. Thus, LPI and CPI are more important factors in influencing the Labour's and Conservative's votes. However, in the Liberal Democrat case, LDCI is larger than LDPI, and thus, LDCI is dominating LDPI in the Liberal Democrat. Thus, LDCI is more important factor in affecting the Liberal Democrat's votes.

Finally, I compare own advertising expenditure coefficients before and after incumbency variables are included. Coefficients of LA and CA are decreased with incumbency variables included. Thus this implies that the benchmark model is proved to be overestimated. But LDA coefficient is increased after incumbency variables including, and therefore, the benchmark model is underestimated. And R^2 value is increased when incumbency variables are incorporated into the benchmark model.

I present incumbency estimation results for three parties. First, the Labour party results for the incumbency effect in 2001 are reported in the Table 2.

I show that comparing to the benchmark case appeared in the second column in the Table 2, the effect of LA on vote share is *weakened* with LPI and LCI included. That is, the estimated coefficient of LA is decreased with the inclusion of LPI or/and LCI. Thus, the benchmark model is overestimated. When we estimate LPI and LCI separately, the LPI and LCI are all significant, and LPI is greater than LCI. But, if we estimate LPI and LCI in an integrated way, then LPI effect absorbs LCI effect. Thus, LPI is dominating LCI when LPI and LCI are estimated together. Thus, the Labour candidates are centered on the *party* incumbency rather than the candidate incumbency. In particular, when we include LCM variable into the estimation equation separately, then LA coefficient is increased and approaches nearly the LA value of the benchmark estimation model. Thus, the Labour candidates

with LCM obtain higher coefficient of LA. Finally, the Labour candidates have significantly positive borough effect.

Table 2. Effect of LA, LPI and LCI on LabVTS for 2001

	LabVTS in 2001				
Const	46.6408 (22.0)**	40.1713 (25.6)**	43.5745 (24.4)**	45.5125 (21.7)**	39.7932 (25.4)**
LA	3.7613 (11.9)**	1.0718 (4.18)**	2.2054 (7.87)**	3.6502 (11.7)**	1.0768 (4.23)**
CA	-2.9084 (-6.04)**	-1.6999 (-4.81)**	-2.3014 (-5.71)**	-2.7886 (-5.90)**	-1.6719 (-4.76)**
LDA	-2.5326 (-7.12)**	-1.3251 (-5.03)**	-1.7611 (-5.86)**	-2.3993 (-6.85)**	-1.2843 (-4.91)**
LA²	-0.1215 (-6.68)**	-0.0479 (-3.53)**	-0.0826 (-5.37)**	-0.1172 (-6.56)**	-0.0476 (-3.53)**
CA²	0.0880 (2.61)**	0.0453 (1.84)**	0.0619 (2.20)**	0.0863 (2.61)**	0.0453 (1.86)**
LDA²	0.0541 (2.02)**	0.0084 (0.431)	0.0249 (1.11)	0.0463 (1.76)	0.0055 (0.286)
LPI	-	19.6775 (23.8)**	-	-	18.8125 (14.5)**
LCI	-	-	13.1108 (16.6)**	-	0.5019 (0.458)
LCM	-	-	-	5.1739 (5.01)**	2.4997 (3.21)**
BOR	5.1689 (7.05)**	2.3783 (4.36)**	3.0628 (4.90)**	4.8998 (6.79)**	2.2903 (4.22)**
R²	0.736	0.861	0.816	0.746	0.863

Note: The second column denotes the benchmark case. The third, fourth and fifth columns are the results when LPI, LCI and LCM variables are included separately. And the last column is the result of the integrated case where LPI, LCI and LCM variables are included together.

The following Table 3 shows the Conservative party results in the incumbency model for 2001 election.

Table 3. Effect of CA, CPI and CCI on ConVTS for 2001

	ConVTS in 2001			
Const	15.9458 (7.31)**	9.1443 (5.36)**	10.6300 (5.83)**	9.0985 (5.34)**
LA	-1.5943 (-4.91)**	0.2786 (1.05)	-0.1693 (-0.604)	0.2844 (1.07)
CA	4.9780 (10.1)**	3.2772 (8.44)**	3.7207 (9.00)**	3.2784 (8.46)**
LDA	1.7492 (4.79)**	0.0562 (0.192)	0.4592 (1.48)	0.0506 (0.174)
LA²	0.0217 (1.16)	-0.0311 (-2.14)**	-0.0185 (-1.19)	-0.0313 (-2.15)**
CA²	-0.1893 (-5.48)**	-0.0925 (-3.43)**	-0.1153 (-4.00)**	-0.0922 (-3.42)**
LDA²	-0.1712 (-6.24)**	-0.0349 (-1.58)	-0.0702 (-3.01)**	-0.0350 (-1.59)
CPI	-	16.8444 (21.0)**	-	14.6481 (9.92)**

ConVTS in 2001				
CCI	-	-	14.8550 (17.3)**	2.6063 (1.77)*
BOR	-3.7185 (-4.94)**	-1.0660 (-1.80)**	-1.7405 (-2.76)**	-1.0648 (-1.80)**
R²	0.556	0.738	0.699	0.740

Note: The second column denotes the benchmark case. The third and fourth columns are the results when CPI and CCI variables are included separately. And the last column is the result of the integrated case where CPI and CCI variables are included together.

I found that the coefficient of CA is decreased with CPI or/and CCI including. In particular, in the integrated case, coefficient of CPI is larger than that of CCI, implying that CPI effect is dominating CCI effect. Thus, CPI is dominant factor in influencing Conservative votes. Thus, the Conservative candidates are also centered on the party incumbency rather than the candidate incumbency. As we expected, the borough effect of the Conservative party has a negative sign which is significant.

Finally, the Liberal Democrat results of the incumbency effect for the 2001 election are shown in the following Table 4.

Table 4. Effect of LDA, LDPI and LDCI on LDVTS for 2001

LDVTS in 2001				
Const	18.7929 (13.8)**	16.0833 (14.1)**	16.3059 (14.5)**	16.0656 (14.4)**
LA	-1.4449 (-7.11)**	-1.1924 (-7.04)**	-1.1083 (-6.62)**	-1.1228 (-6.76)**
CA	-0.1565 (-0.506)	0.2725 (1.06)	0.1778 (0.701)	0.2367 (0.939)
LDA	1.3071 (5.72)**	1.9124 (9.91)**	1.6183 (8.62)**	1.7580 (9.21)**
LA²	0.0383 (3.28)**	0.0339 (3.49)**	0.0302 (3.15)**	0.0312 (3.29)**
CA²	0.0102 (0.473)	-0.0277 (-1.53)	-0.0209 (-1.18)	-0.0256 (-1.45)
LDA²	0.0757 (4.40)**	-0.0178 (-1.16)	0.0149 (1.03)	-0.0022 (-0.146)
LDPI	-	15.6814 (16.9)**	-	6.4599 (3.37)**
LDCI	-	-	15.8972 (17.7)**	10.2982 (5.47)**
BOR	0.7451 (1.58)	0.1973 (0.503)	0.2299 (0.595)	0.1857 (0.485)
R²	0.751	0.829	0.834	0.837

Note: The second column denotes the benchmark case. The third and fourth columns are the results when LDPI and LDCI variables are included separately. And the last column is the result of the integrated case where LDPI and LDCI variables are included together.

The estimation results for the Liberal Democrat party differ from the Labour and Conservative results in three respects. First, the coefficient on LDA is increased after LDPI and LDCI are included. Second, LDPI coefficient is smaller than LDCI in both separate and integrated estimation cases. For the Liberal Democrat party case, LDCI effect is dominating LDPI effect. Thus, the Liberal Democrat candidate is centered on the *candidate incumbency*. Thus, LDCI is dominant factor in affecting Liberal Democrat votes. Finally, the Liberal Democrat candidates have positive signs for the borough dummy, but are not significant.

Thus, *PI* is the most important factor in the Labour and Conservative parties to influence their votes, and *CM* plays a modest role in affecting their votes. But, *CI* plays an important role in influencing the votes for the Liberal Democrat candidates.

4. INTERACTION ESTIMATION RESULTS

4.1 Interaction Effect

Now, this paper aims to estimate the interactive effect. First, I consider descriptive statistic analysis. At first, it is useful to compare the mean expenditures between incumbent (PI and CI) candidates and non-incumbent (non-PI and non-CI) candidates. The statistics show that PI and CI candidates *outspent*, on average, non-PI and non-CI candidates both in all of three general elections and in all of three major parties. According to the following Tables 5, 6 and 7, average expenditures of PI and CI candidates is greater than those of non-PI and non-CI candidates, respectively, for all three parties in all of three elections. There are similar trends over time between average expenditures of PI, CI and CM candidates in two major parties. For example, average spending by Labour PI candidates ranged from 7.5 to 8.5 pences per registered voter in three elections. In addition, PI candidates from the Liberal Democrat spend more than those of the Labour and Conservative candidates.

In particular, there are large differences in average expenditures between PI (and CI) and non-PI (and non-CI) candidates in the Liberal Democrat party. That is, PI candidates from the Liberal Democrat spend three times as much as non-PI candidates.

Table 5. Labour party expenditures

	1992	1997	2001
<i>LA Average</i>	6.5276	7.5237	7.2433
<i>LPI · LA Average</i>	7.5211	8.0022	8.5773
<i>NLPI · LA Average</i>	5.9514	7.1691	4.7375
<i>LCI · LA Average</i>	7.5367	7.9963	8.6179
<i>NLCI · LA Average</i>	6.0362	7.2470	5.2265
<i>LCM · LA Average</i>	-	-	8.1198

Note: NLPI and NLCI represent Non-Party Incumbency and Non-Candidate Incumbency in Labour party.

Main features are that average incumbency expenditures for the Labour candidates are greater than average non-incumbency expenditures both at the party and at the candidate incumbency (see Table 5).

Table 6. Conservative party expenditures

	1992	1997	2001
<i>CA Average</i>	6.6266	6.8980	7.7224
<i>CPI · CA Average</i>	7.3306	8.1905	9.1704
<i>NCPI · CA Average</i>	5.6453	5.5177	7.2225
<i>CCI · CA Average</i>	7.3306	8.1518	9.0884
<i>NCCI · CA Average</i>	5.9446	6.0922	7.3427
<i>CCM · CA Average</i>	7.3505	8.3506	-

Note: NCPI and NCCI represent Non-Party Incumbency and Non-Candidate Incumbency in Conservative party.

Table 7. Liberal democrat party expenditures

	1992	1997	2001
<i>LDA Average</i>	3.9929	3.9600	4.0794
<i>LDPI · LDA Average</i>	9.6632	11.2237	11.6498
<i>NLDPI · LDA Average</i>	3.7884	3.6888	3.4783
<i>LDCI · LDA Average</i>	9.7109	11.0558	11.3788
<i>NLDCI · LDA Average</i>	3.7963	3.7308	3.5919

Note: NLDPI and NLDCI represent Non-Party Incumbency and Non-Candidate Incumbency in Liberal Democrat party.

Tables 6 and 7 also show that average incumbency expenditures for the Conservative and Liberal Democrat candidates are larger than those of non-incumbency candidates both at the party and at the candidate incumbency level.

When examining the relationship between incumbency status (PI, CI and CM) and expenditures, I found that PI, CI and CM status are perhaps the most important factors in influencing the level of a candidate's campaign expenditures in the British general election. In general, we could expect that incumbents and outgoing cabinet ministers tend to spend less than non-incumbents. We can imagine that PI candidates would spend less than non-PI ones because they have well known to voters. But, our statistical analysis shows that incumbents *outspend* non-incumbents in spite of their well recognition to voters in the British elections.

I now use an interactive variable between incumbency status and incumbent's spending so as to test the effectiveness of incumbent candidates when they spend higher expenditures. I now estimate the effect of interactive term on the votes. The interactive terms are measured as the incumbency status multiplied by incumbent's expenditures. I include *party incumbency* status (i.e., LPI and CPI) for the interactive term in the Labour and Conservative voting equations, but *candidate incumbency* status (i.e., LDCI) in the Liberal Democrat voting equation⁸ [4]. Thus, the interactive terms are given by $LPI \cdot LA$, $CPI \cdot CA$ and $LDCI \cdot LDA$ in each voting equation.

I estimate the effect of $LPI \cdot LA$ (or $CPI \cdot CA$ or $LDCI \cdot LDA$) on the votes. Then, the estimation equations for the *interactive* effect are represented as:

$$\begin{aligned} LabVTS_i &= [INCE] + \alpha_{10} \cdot LPI \cdot LA_i \\ ConVTS_i &= [INCE] + \alpha_{10} \cdot CPI \cdot CA_i \\ LDVTS_i &= [INCE] + \alpha_{10} \cdot LDCI \cdot LDA_i \end{aligned}$$

where *INCE* represents terms in an incumbency estimation model. Recall that $LabVTS_i$, $ConVTS_i$ and $LDVTS_i$ are votes share (%) gained by candidates *i* from the Labour, Conservative and Liberal Democrats parties, respectively. *LA*, *CA* and *LDA* are the per capita expenditures of candidates *i* expressed in pence. *LPI*, *CPI* and *LDPI* are dummy variables to account for *party* incumbency status for the Labour, Conservative and Liberal Democrat candidates, respectively. *LCI*, *CCI* and *LDCI* are dummy variables to account for *candidate* incumbency status for the Labour, Conservative and Liberal Democrat candidates, respectively.

And $LPI \cdot LA$ represents the product of incumbency status and incumbent's campaign expenditure for the Labour candidate *i*. Thus, it is the *interactive* component of the expenditure variable. Similarly, $CPI \cdot CA$ is defined for the Conservative candidates, and $LDCI \cdot LDA$ is for the Liberal Democrats candidates. The interactive coefficients α_{10} are expected to be *positive*.

⁸This choice is based on the previous estimation results showing that the 'party' incumbency is more effective for the Labour and Conservative candidates, whereas the 'candidate' incumbency is more effective for the Liberal Democrat candidates.

Then, I present interactive estimation results for the 2001 election for three parties as:

$$\begin{aligned}
 LabVT_{\$}^{2001} &= 34.7438 + 1.1678 \cdot LA - 1.3062 \cdot CA - 1.1252 \cdot LDA \\
 &\quad (21.7)^{**} \quad (4.83)^{**} \quad (-3.89)^{**} \quad (-4.52)^{**} \\
 &\quad + 0.0171 \cdot LA^2 + 0.0309 \cdot CA^2 - 0.0006 \cdot LDA^2 + 2.1364 \cdot BOR \\
 &\quad (1.15) \quad (1.34) \quad (-0.036) \quad (4.15)^{**} \\
 &\quad + 33.5568 \cdot LPI + 0.3847 \cdot LCI + 2.4049 \cdot LCM - 2.0254 \cdot LPI \cdot LA \\
 &\quad (15.7)^{**} \quad (0.370) \quad (3.25)^{**} \quad (-8.40)^{**} \\
 \\
 ConVT_{\$}^{2001} &= 8.5012 + 0.4096 \cdot LA + 3.0025 \cdot CA + 0.0378 \cdot LDA \\
 &\quad (5.21)^{**} \quad (1.61)^{*} \quad (8.05)^{**} \quad (0.135) \\
 &\quad - 0.0389 \cdot LA^2 - 0.0599 \cdot CA^2 - 0.0322 \cdot LDA^2 - 1.0464 \cdot BOR \\
 &\quad (-2.79)^{**} \quad (-2.29)^{**} \quad (-1.53) \quad (-1.85)^{**} \\
 &\quad + 36.1825 \cdot CPI + 1.4874 \cdot CCI - 2.2572 \cdot CPI \cdot CA \\
 &\quad (11.4)^{**} \quad (1.05) \quad (-7.61)^{**} \\
 \\
 LDVT_{\$}^{2001} &= 16.3200 - 1.1153 \cdot LA + 0.2190 \cdot CA + 1.5394 \cdot LDA \\
 &\quad (14.7)^{**} \quad (-6.77)^{**} \quad (0.876) \quad (7.69)^{**} \\
 &\quad + 0.0304 \cdot LA^2 - 0.0230 \cdot CA^2 + 0.0186 \cdot LDA^2 + 0.2013 \cdot BOR \\
 &\quad (3.22)^{**} \quad (-1.31) \quad (1.14) \quad (0.530) \\
 &\quad + 5.2567 \cdot LDPI + 28.6165 \cdot LDCI - 1.5607 \cdot LDCI \cdot LDA \\
 &\quad (2.72)^{**} \quad (4.97)^{**} \quad (-3.36)^{**}
 \end{aligned}$$

The following Table 8 shows the interactive estimation results comparing to the incumbency estimation results.

Table 8. Interaction effect for 2001 election

	Lab		Con		LD	
	INCE	Incl. INT	INCE	Incl. INT	INCE	Incl. INT
$_A^{1)}$	1.0768 (4.23) ^{**}	1.1678 (4.83) ^{**}	3.2784 (8.46) ^{**}	3.0025 (8.05) ^{**}	1.7580 (9.21) ^{**}	1.5394 (7.69) ^{**}
$_PI$	18.8125 (14.5) ^{**}	33.5568 (15.7) ^{**}	14.6481 (9.92) ^{**}	36.1825 (11.4) ^{**}	6.4599 (3.37) ^{**}	5.2567 (2.72) ^{**}
$_CI$	0.5019 (0.458)	0.3847 (0.370)	2.6063 (1.77) [*]	1.4874 (1.05)	10.2982 (5.47) ^{**}	28.6165 (4.97) ^{**}
INT²⁾	-	-2.0254 (-8.40) ^{**}	-	-2.2572 (-7.61) ^{**}	-	-1.5607 (-3.36) ^{**}
R^2	0.863	0.877	0.740	0.762	0.837	0.840
AINT ³⁾		8.5773		9.1704		11.3788

Notes: 1. 1) $_A$ represents own expenditures: LA, CA and LDA.

2) INT denotes interactive effect terms: $LPI \cdot LA$, $CPI \cdot CA$ and $LDCI \cdot LDA$.

3) AINT represents actual INT, or actual average interactive expenditures, measured by pence.

2. Columns 2, 4, and 6 represent the results of incumbency estimation (INCE) model.

The main features are that the interactive terms have *negative* signs for all three parties, and are significant. This implies that there will be *inefficient* vote outcome. In particular, coefficient of interactive effect for the Conservative party is largest, implying that Conservative incumbent candidates are the most ineffective when they spend more money. In contrast, the Liberal Democrat's incumbent candidates are the most effective when they spend more money. The following Tables 9, 10 and 11 show the interactive estimation results in the three general elections for each party candidate, respectively.

Table 9. Labour estimation result in interactive model

	LabVTS		
	1992	1997	2001
Const	24.0648 (9.06)**	31.6093 (11.9)**	34.7438 (21.7)**
LA	2.6712 (5.39)**	2.8981 (7.61)**	1.1678 (4.83)**
CA	-1.1874 (-1.84)**	-1.5337 (-2.41)**	-1.3062 (-3.89)**
LDA	-2.1723 (-5.34)**	-1.9035 (-5.34)**	-1.1252 (-4.52)**
LA ²	0.0359 (0.904)	-0.0206 (-0.836)	0.0171 (1.15)
CA ²	0.0393 (0.789)	0.0618 (1.33)	0.0309 (1.34)
LDA ²	0.0545 (1.45)	0.0116 (0.415)	-0.0007 (-0.036)
BOR	1.6810 (2.83)**	2.8763 (4.43)**	2.1364 (4.15)**
LPI	42.4801 (13.8)**	36.6465 (12.4)**	33.5568 (15.7)**
LCI	3.4273 (2.34)**	3.2853 (2.43)**	0.3847 (0.370)
LCM	-	-	2.4049 (3.25)**
LPI · LA	-3.8155 (-11.2)**	-2.9595 (-9.87)**	-2.0254 (-8.40)**
R ²	0.854	0.825	0.877
Act LPI · LA ¹⁾	7.5211	8.0022	8.5773

Note: 1) Act LPI · LA denotes actual average LPI · LA (pence).

Table 10. Conservative estimation result in interactive model

	ConVTS		
	1992	1997	2001
Const	20.3704 (8.86)**	13.0635 (7.51)**	8.5012 (5.21)**
LA	-1.2802 (-3.02)**	-0.8253 (-2.88)**	0.4096 (1.61)
CA	4.0896 (6.58)**	3.3129 (6.79)**	3.0025 (8.05)**
LDA	1.2204 (3.18)**	0.8974 (3.24)**	0.0378 (0.135)
LA ²	-0.0111 (-0.355)	-0.0098 (-0.573)	-0.0389 (-2.79)**
CA ²	-0.1846 (-3.59)**	-0.1291 (-3.38)**	-0.0599 (-2.29)**
LDA ²	-0.1495 (-4.18)**	-0.0923 (-4.19)**	-0.0322 (-1.53)
BOR	-0.0309 (-0.0565)	-0.5069 (-1.03)	-1.0464 (-1.85)**
CPI	27.5480 (9.81)**	23.4939 (10.0)**	36.1825 (11.4)**

	ConVTS		
	1992	1997	2001
<i>CCI</i>	-0.4504 (-0.472)	1.2110 (1.54)	1.4874 (1.05)
<i>CCM</i>	0.1013 (0.123)	0.6797 (0.876)	-
<i>CPI · CA</i>	-1.3162 (-3.68)**	-1.2739 (-4.59)**	-2.2572 (-7.61)**
<i>R</i> ²	0.794	0.781	0.762
Act <i>CPI · CA</i> ¹⁾	7.3306	8.1905	9.1704

Note: 1) Act *CPI · CA* denotes actual average *CPI · CA* (pence).

Table 11. Liberal democrat estimation result in interactive model

	LDVTS		
	1992	1997	2001
Const	12.2791 (6.81)**	14.5607 (9.35)**	16.3200 (14.7)**
<i>LA</i>	-1.2381 (-3.71)**	-1.6937 (-6.47)**	-1.1153 (-6.77)**
<i>CA</i>	2.0948 (4.62)**	1.3164 (3.18)**	0.2190 (0.876)
<i>LDA</i>	1.5212 (4.93)**	1.4716 (5.67)**	1.5394 (7.69)**
<i>LA</i> ²	0.0030 (0.124)	0.0443 (2.86)**	0.0304 (3.22)**
<i>CA</i> ²	-0.1799 (-4.96)**	-0.0924 (-2.95)**	-0.0230 (-1.31)
<i>LDA</i> ²	0.0706 (2.33)**	0.0652 (2.95)**	0.0187 (1.14)
<i>BOR</i>	-0.2735 (-0.637)	0.0312 (0.069)	0.2013 (0.530)
<i>LDPI</i>	16.6048 (3.28)**	-3.4453 (-1.07)	5.2568 (2.72)**
<i>LDCI</i>	2.8668 (0.308)	44.7285 (5.69)**	28.6165 (4.97)**
<i>LDCI · LDA</i>	-0.8973 (-1.10)	-2.7681 (-4.40)**	-1.5607 (-3.36)**
<i>R</i> ²	0.754	0.773	0.840
Act <i>LDCI · LDA</i> ¹⁾	9.7109	11.0558	11.3788

Note: 1) Act *LDCI · LDA* denotes actual average *LDCI · LDA* (pence).

4.2 Linkage of Incumbency to Quality Effect

4.2.1 Literature on candidate quality

Some previous studies on the U.S. House election have obtained a surprising result, showing that campaign spending by challengers is found to have a large positive impact, whereas incumbent spending has little or no effect on election outcomes⁹ [12]. Others have found different evidence that incumbent spending has a strong effect on election results¹⁰ [13].

⁹ See Glantz, Abramowitz and Burkart [6], Jacobson [13,14,15,5] and Welch [16].

¹⁰ See Green and Krasno [3,4] and Erikson [9].

However, such results have been received with considerable skepticism since they are based primarily on cross-sectional analyses (or aggregate spending data). Models estimated using cross-sectional data (or aggregate spending data) suffer from two potential sources of bias: an inability to measure 'candidate quality' and the existence of district-specific or constituency-specific factors that are omitted from the model. In the case of campaign spending, both of those biases are likely to overestimate the effects of challenger spending while underestimating the impact of incumbent spending. Failure to control for candidate quality will lead to an upward bias in the estimation of the impact of challenger spending because high-quality challengers will have a greater likelihood of winning and thus will spend more than low-quality ones. In contrast, the failure to include candidate quality will lead to an underestimate of the effects of incumbent spending since incumbents tend to increase campaign expenditures in response to strong challengers. On the other hand, the failure to control for district-specific or constituency-specific factors will also lead to bias in cross-sectional regressions if constituencies differ systematically on characteristics that are correlated with both votes won and campaign expenditures spent. For example, differences in partisanship across constituencies are a source of such effects.

Previous researches have paid only limited attention to those two sources bias. First, on the issue of candidate quality, the studies by Green and Krasno [3] and Levitt [17] are notable exceptions in the sense that they explicitly deal with the candidate quality in their estimation models. Green and Krasno [3] developed an eight-point scale method to proxy only *challenger quality*. But they did not control for incumbent quality. Although the proxy was statistically significant, its inclusion had only minor effects on the spending coefficients and improved a little the fit of the model. But their quality proxy variable failed to fully capture the multidimensional impact of candidate quality which will have larger effect on the expenditure coefficients. Second, attempts to control for district-specific or constituency-specific effects have typically been limited to the inclusion of the lagged or past votes in the district or constituency. The past votes will reflect the quality of the candidates involved in the previous election, the level of campaign spending in that contest and the national political situation. Thus, the lagged vote is unlikely to fully capture differences across districts or constituencies.

Jacobson [13] uses challengers' political quality as a dummy variable, valued one if the challenger has held previous elective office, and zero otherwise. He found a direct effect of the political quality upon the vote. Instead, Green and Krasno [3] use more elaborate political quality scale index measure to control for challenger political quality and found a considerable direct effect on the vote. Green and Krasno [3] define challenger's political quality as a variable taking scores from zero to eight points depending on the challenger's degree of previous political experiences and public prominence. Jacobson [13,5] uses a simple dummy variable to measure the challenger's quality - whether or not the challenger has held previous elective office.

Now, I attempt to present our model, focusing on the *incumbent quality*, rather than challenger's quality. As incumbent candidates spend more money, either the importance of the candidate-centered aspects (or candidate-specific attributes) of the incumbents can be increased (e.g., for the Liberal Democrat case) or party-centered factors (or party or policy quality) of the incumbents may become increasingly important (e.g., for the Labour and Conservative cases). Many of existing estimation models either neglect the direct effect of candidate or party quality or underestimate the influence of quality due to poor measurement. Integrating *candidate incumbency interacted with spending* into the existing campaign spending model will improve the predictive accuracy of the model and contribute to the understanding of the general election in Great Britain.

Incumbency (PI and/or CI) status will contribute to important electoral assets to candidates, in particular, in the British election. Thus, candidates who have incumbency position can be considered high-quality candidates which might be a great threat to opponents. These candidates are able to mount more effective campaigns than non-incumbent candidates. I show that incumbent (PI and/or CI) candidates spend, on average, more money than non-incumbent candidates. Furthermore, I found that incumbent (PI and/or CI) candidates receive more votes than non-incumbent candidates. The existing literature says that campaign spending is less important for incumbent candidates than for non-incumbent candidates, challengers. This is the case when we focus only on the 'resource effect'. However, I show that campaign spending will be more important for incumbent candidates than for

non-incumbent candidates in *quality signaling model* because they attempt to signal their high quality. But, our *interactive* estimation results show that there are negative signs for the coefficients of interaction terms, implying that there is an *inefficient vote outcome* when incumbent (high quality) candidates engage in 'high spending'.

Green and Krasno [3] argue that as spending increases and the name and background of the challenger become known, we might expect the candidate-centered aspects (such as challenger quality) of the election contest to rise and party-centered factors (such as challenger party strength or previous vote share) to decline.

We expect that when spending increases and the name recognition of the incumbent candidates becomes well known to voters, the candidate-centered aspects (such as candidate quality) of the election contest will increase, or the party-centered factors (such as party or policy quality) will rise: that is, the name recognition or policy aspects will matter in the low and medium spending levels, but the quality-centered factors will count in the higher spending level. Similarly, we expect that the candidate's general aspects will matter in the low and medium spending levels, but the candidate's *quality* factors will count in the higher spending level.

4.2.2 Incumbency, spending and quality

Now, I attempt to connect the incumbency status to the quality effect. One of the well-known facts about US congressional elections is that incumbents almost always win. What accounts for the electoral success of incumbents? The typical answer involves *incumbent advantages*. Among these are high name recognition, opportunities for constituency favors and the franking privilege. Above all, incumbents possess the ability to raise and spend large sums of money on their reelection campaigns. For instance, for the 2001 general election in the Great Britain, the average expenditures of all incumbent candidates in the three main political parties has outspent the average expenditures of all candidates and those of non-incumbent candidates. However, there is some question about whether these out-spended resources are the advantage they appear to be or whether these lavish expenditures are productive or inefficient.

The notion of 'candidate quality' has a broad meaning. It is generally recognized that some candidates are 'better' than others. For instance, Jacobson (1983) referred to 'strong' and 'attractive' candidates compared to weak or unattractive ones. But, most of literatures defined the quality notion in a narrow manner, focusing on the case of challenger's quality. Jacobson and Kernell [18] used the term 'challenger quality', rather than general candidates or incumbents, to describe well-funded, politically experienced challengers. Bond, Covington and Fleisher [6] measured 'challenger quality' as a combination of challenger personal attributes and campaign spending. Green and Krasno [3] regarded 'challenger political quality' as the *personal* characteristics of the challenger that contribute to the strength of his candidacy. They defined candidate's political quality as the sum of two attributes: attractiveness and political skill. The notion of attractiveness includes a full range of characteristics that might be appealing effectively to voters: that is, it represents qualifications for office in the form of political experience, education and occupational background, fame and name recognition, physical appearance and personality. The notion of skill includes a candidate's ability to organize a campaign and to present himself effectively to voters. Then, they constructed challenger's political quality based on the backgrounds of challengers and developed a point scale system which attributes point values to various background characteristics. Based on the point scores, they distinguished high-quality from low-quality challengers.

Instead, I use the quality term on a different but still narrow context by focusing the *incumbent's* quality, rather than challenger's. I measure candidate quality as a dummy variable based on the incumbency status. That is, I suppose that the candidate quality is determined by incumbency status which is either at the party or at the candidate level. I first distinguish 'candidates *with* incumbency (PI or CI)' from ones *without* incumbency' (i.e., non-incumbents), and then differentiate 'candidates with PI' from 'candidates with CI'. I then consider the candidate with PI or CI as the experienced or 'high-quality candidate' and refer to the candidate without PI or CI as the inexperienced or 'low-quality candidate'. I view the incumbency and experience in elective or political office as the most important

factor in the electoral competition in Great Britain. Incumbency status is often considered by voters to be an impressive qualification for congressional or parliamentary candidates. In addition, it reflects not only the acquisition of political skills, including campaign experience, but also provides candidates with the political connections which are important to campaigning.

Whereas Green and Krasno [3] assumed challenger's quality, I assume incumbent's quality, and thus the result will be different. In our case, the interaction between incumbent (high-quality) candidates and their spending turns out to have *negative* impact on votes for all three political parties¹¹ [14]. This indicates that spending is *less* productive as candidates are high quality: I refer to this as the *inefficient vote outcome*. As high quality candidates spend more money, the vote productivity is likely to decrease. That is, quality signaling may be effective, but vote outcome is inefficient. Alternatively, spending will more productive as candidates are non-incumbents and thus low quality. As non-PI or low quality candidates spend more money, the vote productivity is shown to increase. The following Table 12 shows the effect of incumbency status on vote shares.

Table 12. Effect of incumbency on vote shares

	1992	1997	2001
<i>LPI</i>	12.5824 (7.48)**	11.2387 (7.14)**	18.8125 (14.5)**
<i>LCI</i>	3.7403 (2.33)**	3.4992 (2.41)**	0.5019 (0.458)
<i>CPI</i>	17.9386 (17.3)**	13.4483 (16.0)**	14.6481 (9.92)**
<i>CCI</i>	-0.3619 (-0.376)	1.4946 (1.87)**	2.6063 (1.77)**
<i>LDPI</i>	16.6626 (3.29)**	-1.5941 (-0.494)	6.4599 (3.37)**
<i>LDCI</i>	-5.5973 (-1.08)	13.2874 (4.00)**	10.2982 (5.47)**

The following Table 13 shows the estimation results of the interactive effect for three general elections.

Table 13. Interactive effect result

	1992	1997	2001
<i>LPI · LA</i>	-3.8155 (-11.2)**	-2.9595 (-9.87)**	-2.0254 (-8.40)**
<i>CPI · CA</i>	-1.3162 (-3.68)**	-1.2739 (-4.59)**	-2.2572 (-7.61)**
<i>LDCI · LDA</i>	-0.8973 (-1.10)	-2.7681 (-4.40)**	-1.5607 (-3.36)**

Finally, I turn to interpret this result. Over the last two decades, political scientists and empirical economists have examined the electoral advantages conferred by incumbency both at the federal and at the state level in U.S., and proved to considerably affect U.S. legislative elections. The incumbency advantage has been increased considerably in U.S. House elections. Cox and Katz [8] examined the cause of the incumbency advantage. Much of the literature focused on explaining why the incumbency advantage in U.S. House elections grew so substantially. The two explanations have been dominated in the literature: one focuses on *resources* of various kinds and opportunities to perform constituency services, and the other emphasizes the partisan de-alignment.

¹¹On the contrary, Green and Krasno [3] estimate an interaction effect between challenger quality and challenger expenditures, and show that there is a positive relation between them. This implies that challenger's quality becomes more important as their spending rises: in other words, spending is more productive as challenger is a high-quality one.

Instead, Cox and Katz [8] suggest three causes of incumbency advantage which are different from the existing literature. They decompose the incumbency advantage into resources, scare-off and quality effects.

First, the direct resources effect of the incumbency advantage represents the value of the resources attached to legislative office. This implies that legislative resources, such as personal staff, the franking privilege and staff and office allowances, can be used in electorally useful ways.

Second, the scare-off effect of the incumbency advantage reflects the ability of incumbents to scare off high-quality challengers. This indicates that potential challengers will be less inclined to enter the election contest since they know that incumbents will gain large benefits from the resources they can use. That is, incumbents can scare off high-quality challengers. Finally, the quality effect reflects how much electoral advantage a party accrues when it has an experienced candidate, rather than an inexperienced one. Thus, the quality effect indicates that the incumbent advantage will be increased if there is a quality differential between candidates. Thus, the incumbent advantage depends on the candidate quality in determining votes. In contrast, I treat the incumbency status and candidate quality as the same concept. That is, I define incumbency holder as high-quality candidates.

In addition, Cox and Katz [8] estimate the size of the resources, scare-off and quality effects for U.S. House elections from 1946 until 1990 period, and showed that most of the increase in incumbency advantage is caused by increase in the quality effect. They suggest from their empirical evidence that much of the growth in the incumbency advantage at the federal level in U.S. cannot be accounted for by resource growth but by quality effect. They show that growth in the incumbency advantage stemmed primarily from growth in the quality effect of candidates. This explains the reason why a high-quality experienced candidate is becoming more important in obtaining votes¹² [15].

It is crucial to understand that the incumbency status (or 'previous electoral experience') both at the candidate (CI) and at the party (PI) level become more and more important in predicting vote shares. In our context, there are three factors affecting the incumbency: (i) resources or campaign expenditures each candidate spends during the election, (ii) candidate characteristics such as CI, and (iii) party or policy characteristics like PI. But I first focused on the resources effect in the benchmark quadratic estimation model, and found that there is significantly positive effect of expenditures on votes. Second, I examined the PI and CI effects in the incumbency estimation model, and showed that there is substantial positive impact on votes. Finally, I estimated the '*interaction effect*' between PI and/or CI (high-quality candidate) and high spending in the interaction estimation model, and found that there is a negative relation between them.

I conclude that the 'incumbency' of candidates is closely related to their 'quality'. As a result, incumbency status (i.e., high quality) will not only affect directly votes, but influence indirectly (by quality signaling effect) votes through high spending. In general, the term 'quality' refers to anything about both candidates themselves and their party or policy platforms that enable them to garner votes. Thus, other things being equal, high-quality candidates will outperform low-quality candidates in vote gaining.

5. SUMMARY AND CONCLUDING REMARKS

This paper aims to estimate the effect that campaign spending for advertising activities had on the votes in the three general elections in Great Britain. Lee [1] estimated the basic model by regressing votes of candidates on their own spending and on the spending of their opponents. The estimates showed advertising expenditures to be a powerful conditioning variable. I use a sample of

¹²Note that in terms of absolute value, the direct effect is much greater than indirect or quality effect. But, they focus on the growth rate of the quality effect over time.

British general election results and estimate the effect of campaign expenditure on votes, showing that candidate's own expenditure increases its vote share, but opponent's spending decreases its votes. While each candidate's spending has diminishing returns, the effects are different between parties. I extended Lee [1] to incorporate the incumbency and interactive effect.

First, I estimated an *incumbency* effect. In an incumbency estimation with *PI and CI included*, the coefficients of PI for Labour and Conservative candidates are positive and significant¹³ [5]. But, the coefficients of CI for both major parties are positive, but small and insignificant. Interestingly, the coefficients of LDCI for Liberal Democrat candidates are positive and significant.

Thus, the overall pattern of incumbency effect seems clear. As we expected, the incumbency, either party or candidate, leads to a substantial increase in votes in the British general elections. Our findings show that the influence of PI on vote shares far exceeded the influence of CI for the Labour and Conservative candidates. This implies that PI appears paramount in influencing the vote shares of the candidates. The influence of PI on vote share is very large and significant for the Labour and Conservative candidates, but differs in magnitude between parties. But the effect of CI is very small and not significant for the Labour and Conservative parties. However, for the Liberal Democrat party case, the influence of CI on Liberal Democrat vote share is much larger than PI.

An estimate of the overall (integrated) effect of an incumbent candidate representing an incumbent party in a given constituency can be calculated from these empirical results. This overall (or double incumbency) effect can be estimated directly by summing the coefficients of the candidate and party incumbency dummy variables. The overall effect is similar to the *party incumbency* effect in the Labour and Conservative parties. The overall effect is dominated by the *party incumbency* for the Labour and Conservative parties, whereas the overall effect for the Liberal Democrat party is dominated by the *candidate incumbency*. This overall effect implies that the 'established brand' in the British parliamentary election enjoys a substantial advantage over a new brand, or challengers, in garnering votes.

Second, I estimated an *interaction* effect between incumbent quality (incumbent status) and incumbent spending. I assume that candidate quality with incumbency (either PI or CI) interact with candidate spending so as to influence votes. Our estimation result shows that high-quality candidates with incumbency status spend money *inefficiently* than low-quality candidates who have no incumbency status.

In sum, there are two striking features of our results. First, I show that PI and CI are important factors in explaining the vote share each candidate receives. Thus, I view the incumbency and experience in elective or political office as the most important factor in the electoral competition in Great Britain. Second, I found that the effects of PI and CI on votes *differ* across parties: for the Labour and Conservative parties, PI effect dominates CI effect, but for the LD party, CI effect dominates PI effect. For the Labour and Conservative, this implies that voters became *more party-oriented*. For the Liberal Democrat party, it implies that voters became *more candidate-oriented*. This suggests that the party campaign organization and management should be focused to promote the candidate-centered factors in the Liberal Democrat.

COMPETING INTERESTS

Author has declared that no competing interests exist.

¹³Note that in simple linear and quadratic estimations with PI and CI excluded, the estimation results support the premise that campaign expenditures do influence votes in a positive and significant way. In particular, own expenditures are shown to be significantly positive and opponents' expenditures to be negative.

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