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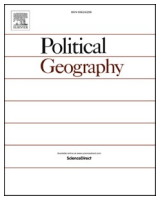

Full Length Article

Volatile campaigns? The effects of shocks on campaign effectiveness in British general elections☆

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A B S T R A C T

Some political events, such as the referendum on the UK's continued membership of the EU in 2016, have the potential to alter substantially the electoral landscape, changing long-standing patterns of party alignment and support. Recent work suggests they also have the capacity to influence where and how much parties' local campaign efforts might affect their support. Analysis of the fallout from the UK's Brexit referendum suggests that after the vote, pro-Brexit parties' campaigns yielded greater rewards the lower the local support for Brexit, while pro-Brexit parties' campaigns became more effective where support for Brexit was higher. In this paper, we subject that claim to further scrutiny. Firstly, we employ alternative measures of campaign intensity with greater coverage of cases to assess whether the findings hold. Secondly, we broaden our understanding by looking at the campaigns of a wider range of parties than in the previous research. Thirdly, we extend the analysis to examine another political shock with major electoral consequences, the 2014 referendum on Scottish independence. Our results broadly confirm previous research findings, but we also uncover some important variations and differences. Parties do not campaign in a vacuum: no matter how professional their operations, the climate of national and local opinion affects their capacity to gain a hearing.

The constituency election campaigns literature often implicitly assumes that campaign effects are relatively constant over time. However, recent research has shown that this is not the case. How popular or unpopular a party is nationally relative to its rivals, and how close (or not) the national competition between the major parties can affect how much benefit it receives from its local campaign activity (Fisher et al., 2011, 2019; Pattie et al., 2019).

Other factors can also have a bearing on how well a party's campaign goes. Large shocks to the entire political system have the potential to substantially change how various factors influence vote choice. In the years after the 2010 UK General Election, British politics was roiled by several such shocks, not least referendums on Scottish independence (in 2014) and on leaving the EU (in 2016), which substantially shook up established patterns of party support (Fieldhouse, Green, et al., 2020; Henderson et al., 2022). It is also possible that these political earthquakes, by disrupting people's perceptions of the parties and what they stand for, will influence how easily a party obtains a hearing in subsequent election campaigns. Using data from a survey of election agents responsible for the administration of Conservative and Labour constituency campaigns in Britain's 2015, 2017 and 2019 elections, Fisher et al. (2023) provide evidence that increasing local levels of support for Brexit enhanced the effectiveness of the Conservatives' constituency campaigns and dulled that of Labour's campaigns in subsequent elections. In this paper, we build on their work to make three novel contributions. Firstly, we test the validity of their results by using an independent measure of campaign effort - the amount spent by constituency candidates on their campaigns - which unlike the survey measure has complete coverage of cases and omits any potential non-response bias. Secondly, we look beyond Labour and the Conservatives to assess whether the Brexit shock affected other parties' campaigns. Thirdly, we extend the analysis to examine the effects of not only the 'Brexit referendum' shock on campaigning in England and Wales (and separately in Scotland), but also, uniquely, of the 2014 independence vote on campaign effectiveness in Scotland, which hitherto has not received similar attention.

We proceed by setting out, in the next section, the theory and hypotheses underpinning our analyses. We then discuss our data and methodology, before presenting our results. Our findings for local campaign effects in England and Wales confirm Fisher et al.'s (2023) research. Compared to the situation in elections before the Brexit referendum, the higher the level of local support for leaving the European Union, the weaker the positive effect of Labour's local campaign, and

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the stronger that of the Conservatives', on their respective support became. Moreover, our analysis also shows that more intensive campaigning by the Liberal Democrats led to better outcomes post-referendum in seats where Brexit was less popular, particularly in 2019. Our novel findings show that electoral shocks' impacts on campaigning are not uniform: rather, they are to some degree *sui generis* and context-bound. We show that, the effects of the Brexit and independence referendum 'shocks' on party campaign effectiveness in Scotland are not as clear-cut as that of the Brexit shock on campaigning in England and Wales. There, the Brexit shock had only limited effects on the parties' campaigns, while the SNP's campaign effectiveness was dulled rather than (as expected) increased by greater local support for independence, while the effect of Conservative campaign was enhanced by it. Even so, Labour's campaign after the 2014 referendum had a more marked positive effect on its vote share where support for independence in 2014 had been relatively low than where it had been relatively high.

1. Political shocks and campaign effectiveness: theoretical expectations

British political parties' constituency election campaigns can influence both their local support and their chances of winning marginal seats (Bochel & Denver, 1971, 1972, Johnston, 1987; Seyd and Whiteley, 1992; Pattie et al. 1995; Denver & Hands, 1997; Whiteley and Seyd, 2003). The harder a party campaigns locally, the better the vote share it can usually expect there.

Past research also demonstrates that the campaign benefits a party can expect in any given seat are affected by a range of factors linked to the particular conditions it faces there, including whether the party is the local incumbent,[1] which party campaign is being considered,[2] how close the election is both nationally and locally, and so on (Fisher et al., 2011, 2019; Pattie et al., 2019).[3] In this paper, however, we focus on the consequences for electoral campaigning of major political shocks, events which shake up and even potentially fundamentally change the relationships between voters and parties. As defined by Fieldhouse et al. (2020, p. 2):

> Electoral shocks are an abrupt change to the status quo. They are not necessarily exogenous to the party system, but they are more than simply the outcome of normal everyday politics. They represent a significant and often unanticipated change … are manifest over prolonged time periods and are highly salient: they have the potential to be noticed … even by (those who) do not have much interest in politics and by people who might otherwise select into information that fits their partisan beliefs and preconceptions. Electoral shocks are, therefore, very difficult for voters and politicians to ignore. (They) are politically relevant and … have the potential to change how parties are perceived and therefore to reshape the party system.

Since 2010, several such events have rocked British politics. Perhaps the most consequential, in terms of both its effects on party support and the entire future direction of the country, was catalysed by the 2016 referendum on Britain's membership of the European Union. This produced a narrow, but far-reaching, victory for those who wanted Britain to leave the EU (52% of voters supported Brexit).

The Brexit referendum had striking effects on how the mainstream parties subsequently positioned themselves on the issue, and on patterns of party support in the 2017 and 2019 UK General Elections (Clarke et al., 2017; Fieldhouse et al., 2020; Sobolewska and Ford, 2020; Whiteley et al., 2023). The Conservatives become increasingly associated with 'getting Brexit done' and taking the UK out of the EU as quickly and comprehensively as possible. The Liberal Democrats, always the most pro-EU of the mainstream parties, went in the opposite direction, campaigning to reverse the referendum result and remain in the EU (or, failing that, to leave but remain within the European single market and aligned to the EU's regulations). Labour, meanwhile, was in a very difficult position over the issue, which was very divisive for the electoral coalition the party had developed between traditionally Labour voting working class voters in less affluent constituencies, many of whom had supported Brexit, and left-leaning university-educated middle-class voters in more affluent metropolitan seats, who were largely pro-Remain. In trying not to alienate each group of supporters, the party's Brexit position became unclear and unlikely to satisfy either: neither sufficiently pro-Brexit to please Leave-supporting voters nor sufficiently anti-Brexit to appeal to those who favoured remaining in the EU.[4] Consequently, in subsequent elections, many Brexit-supporting former Labour voters moved to the Conservatives.[5]

Finding themselves in very different positions on such a major and disruptive issue might also be expected to change how effective each of the main parties' campaign efforts would be in elections dominated by Brexit compared to contests prior to the Brexit referendum. Before the referendum and its result turbo-charged the issue and accentuated the parties' different position on it, we might expect local levels of support for Brexit to have little impact on whether a party's campaign received a favourable hearing in the constituency. But if the Brexit shock affected how much (and by whom) a party's campaign was heard, we expect that after the referendum, party campaign effects should be moderated by local levels of support for Brexit. Given the Conservatives' strongly pro-Brexit line, we expect that after the referendum, voters would be more responsive to their campaign blandishments in areas where support for leaving the EU was high than in areas where it was lower. In contrast, we anticipate that that as much more Brexit-sceptical parties, the Liberal

[1] Compared to the incumbent candidate in a seat, challengers tend to get greater positive returns to their campaign efforts (Jacobson, 1978; Pattie et al., 1995, 2017).

[2] In British elections, the Liberal Democrats tend to receive a stronger return for their campaign efforts than do the larger Labour and Conservative parties (Fieldhouse & Cutts, 2009; Fisher et al., 2011). The Liberal Democrats do not receive the same levels of attention between elections as do Labour or the Conservatives. The party's election campaigns therefore afford it an opportunity to overcome that neglect.

[3] All three major parties focus their campaigns more heavily on seats where their margin between winning and losing is small than on seats where they are likely to either lose badly or win comfortably. Due to their much more limited resources, the Liberal Democrats' campaigns tend to be even more marginal-focused than their rivals' campaigns. The Liberal Democrats also face the problem of 'tight targeting' where they often have a small number of marginal incumbent seats while their safer seats are not 'safe' enough to neglect. Resources tend to be focused in marginal (both incumbent and challenger contests) and safer incumbent seats (particularly when the incumbent MP retires) to offset any haemorrhaging in support (Cutts, Russell and Townsley, 2023).

[4] While 66% of semi- and unskilled manual workers (the core 'working class) voted to leave the EU in 2016, only 44% of the professional and managerial middle class did so. Among 2015 Labour voters, just 22% of the professional middle class voted for Brexit, compared to 53% of the 'core' working class. All figures come from Wave 9 (the post-referendum wave) of the British Election Study's internet panel survey (BESIPS).

[5] 17% of those who had voted Labour in 2015 switched to the Conservatives four years later (all results from BESIPS). 2015 Labour voters' later election choices were strongly affected by how they voted in the 2016 Brexit referendum. Among those who voted Labour in 2015 and to remain in the EU in 2016, 73% voted Labour again in 2019, and only 6% voted Conservative (most of the remainder moved to the Liberal Democrats). But among 2015 Labour voters who supported Brexit, only 43% voted Labour again four years later, while 41% had switched to the Conservatives. These shifts had a distinct geography, with higher rates of transfer from Labour to the Conservatives in more Brexit-supporting areas. The evidence also points to similar traffic in the opposite direction among 2015 Conservative voters: of those who voted to Remain in the EU, 40% did not vote Conservative in 2019 (most of these Conservative 'defectors' switched to the Liberal Democrats). But among Brexit-supporting 2015 Conservative votes, only 7% did not go on to vote for the party again in 2019.

Democrats and (at least relative to the Conservatives) Labour might have found it harder to get a hearing for their campaigns in more than in less pro-Brexit areas.

Several hypotheses emerge from the above discussion:

H1. Prior to the Brexit shock, the positive effect of a party's constituency campaign effort on its vote share will be unaffected by local levels of support for Brexit;

H2a. Following the 'Brexit shock', Conservative campaign effort will have a greater positive impact on their vote in seats where support for Brexit is stronger; and

H2b. Following the 'Brexit shock', both Labour and Liberal Democrat campaign effort will have a greater positive impact on their vote in seats where support for Brexit is weaker.

In their test of these expectations, Fisher et al. (2023) show that this was the case for Labour and the Conservatives (they did not investigate the effect on the Liberal Democrats' campaign effectiveness). Compared to the 2015 General Election, the last held before the Brexit referendum, the Conservatives' constituency campaign efforts in the 2019 UK General Election yielded better returns for the party in areas where Brexit had been more popular than in areas where it was less popular. The opposite was true for Labour: after the referendum, its campaigns yielded poorer results in more than in less pro-Brexit areas.

Fisher et al.'s (2023) results are important and deserve further scrutiny. Three questions arise from their analysis, and point to avenues for further investigation, however. First, was the effect of the Brexit 'electoral shock' on campaigning restricted to the Conservative and Labour campaigns, or did it also change the effectiveness of other parties' campaigns?

Second, Fisher et al. draw on a survey of party election agents to build their measures of party campaign intensity in each seat. While this is a proven and high-quality source of information on constituency campaigning in the UK, it has an important limitation. As it is dependent on agents' voluntary participation, and agents' response rates vary, it does not provide full coverage of all constituencies or parties. Of the three main parties, Labour response rates are consistently the highest (more than 60% in 2010 and comfortably above 50% in 2015 and 2017). Liberal Democrat responses are in the same ballpark (above or around 50% in 2010, 2015 and 2017) whereas Conservative response rates are regularly much lower and have fallen below 30% since 2015. The response rates for the SNP were around 50% in 2010 and 2015 but this fell back to 40% in the 2017 and 2019 general elections.[6] As a consequence, not only will some constituencies not have any responses but certain seats may only have one or two responses and not the complete coverage of campaigning undertaken by all parties in the constituency. Extending Fisher et al.'s analysis to cover more parties' campaigns and in most constituencies (and also replicating their results using different measures of campaign intensity) would add further confidence in their results.

Third, if major shocks have the potential to reset the effectiveness of parties' campaigns, there is value in replicating Fisher et al.'s analyses in the context of another such event, which hitherto remains unexplored. The 2014 referendum on Scottish independence provides an obvious candidate (Fieldhouse et al., 2020). On a remarkably high turnout of 85%, 55% voted to remain in the UK, while 45% voted for independence (a much higher level of support for breaking away than before the referendum was first mooted). Support for independence stretched well beyond those who had previously supported pro-independence parties such as the SNP. Did the Independence vote 'shock' have a similar effect to the Brexit 'shock' on campaign effectiveness? And if it didn't, what might that reveal about the conditions under which shocks will – and will not – have such impacts?

As was the case with the Brexit vote in Britain as a whole, the independence referendum had a far-reaching effect on electoral competition in Scotland in subsequent contests, upending previous patterns of party support (Fieldhouse et al., 2020; Henderson et al., 2022). Labour campaigned strongly against independence, sharing platforms with the Conservatives (a difficult position in Scottish politics given the Conservatives' unpopularity there). That put it on the 'wrong' side of the issue for many of its erstwhile supporters. In 2010, the last General Election prior to the independence vote, Labour took 42% of the Scottish vote and 41 of the country's 59 Westminster seats. But in the 2015 General Election, just one year after the independence referendum, its support in Scotland dropped to just 24% and it lost all but one of its MPs there. Voters who had once supported Labour but who also supported independence abandoned the party in large numbers, mainly transferring their support to the SNP, whose share of the Scottish vote rose from 20% in 2010 to almost 50% in 2015. SNP representation in Westminster also surged, from just 6 out of the 59 MPs in 2010 to 56 in 2015. The Liberal Democrats also saw their vote and parliamentary representation fall, partly because of their stance on independence (they, too, campaigned to stay in the UK), and partly due to the fallout from their coalition with the Conservatives: their vote dropped from 19% in 2010 to 7.6% five years later, and their cohort of Scottish MPs dropped from 11 to 1. The Conservatives, meanwhile, did not suffer as badly – partly because their support in Scotland was already low, and partly because the party's supporters shared its antipathy to independence and had voted accordingly in the referendum (so were under no pressure to reconsider their support).

The new electoral landscape in Scotland persisted at subsequent elections. The SNP remained comfortably the dominant party in 2017 and 2019 (albeit with lower vote shares and fewer MPs than in 2015). For Labour, meanwhile, things got if anything worse, as the party was pushed into third place behind the Conservatives in 2017 and into fourth place behind both the Conservatives and the Liberal Democrats in 2019.

If the independence vote 'shock' has the same effect as we hypothesise for the Brexit 'shock', we would anticipate that, because of the various parties' different positions in the independence referendum (Labour, the Conservatives and the Liberal Democrats opposed to independence, the SNP in favour), and because of its disruptive effects on subsequent patterns of party support in Scotland, its 'electoral shock' should also have an impact on the effectiveness of the parties' constituency campaigns. Among the 'anti-independence' parties, we expect that (compared to pre-referendum elections) their constituency campaign efforts in post-referendum contests should become less effective, and that this effect should be most pronounced in seats where support for independence in 2014 was highest. We would anticipate that the effect will be most pronounced for Labour campaigns: by finding itself on the opposite side of the issue to many of its former voters, the party potentially made it harder for itself to obtain a hearing for its campaign messages. We would expect the opposite to be true for the SNP. As the main pro-independence party, its campaign efforts in post-referendum elections should produce greater benefits for the party in seats where the independence vote was high than where it was low. We do not expect to see such effects, however, in contests before the referendum took place.

As with the Brexit shock, the above discussion provides several hypotheses regarding the effects of the independence referendum shock on party campaign effectiveness:

H3. Prior to the 2014 independence referendum, the positive effect of

[6] The agent survey response rates for each party across the four elections (2010-19) is as follows: Labour 50.6%; Liberal Democrats 48.6%; Conservatives 35.1%. Aside from an 8-point drop in Labour response rate between 2010 and 2015, generally speaking there is little variability in Labour and Liberal Democrat responses from one election to another until 2019. Conservative responses were already much lower than Labour and the Liberal Democrats in 2010 and have declined steadily at each election since. Response rates were much lower for all parties in 2019 although the differences between parties persisted.

Table 1
The effect of local support for Brexit on constituency campaign effects, 2010–2019: England and Wales only.

	Y = % share of electorate, t							
Party:	2010		2015		2017		2019	
	b	SE	b	SE	b	SE	b	SE
Constant	−0.902	1.701	2.461	1.043[a]	−5.082	1.312[b]	−0.067	1.510
Labour candidate	4.778	2.509	8.688	1.414[b]	8.388	1.914[b]	−2.826	2.334
Liberal Democrat candidate	0.417	2.529	1.898	1.463	5.159	1.672[b]	0.345	1.879
% share of electorate, t-1	0.992	0.174[b]	0.693	0.083[b]	1.014	0.114[b]	0.751	0.121[b]
% campaign spend, t	0.058	0.027[a]	0.020	0.026	0.015	0.027	−0.185	0.038[b]
Squared % share of electorate, t-1	0.000	0.005	0.006	0.001[b]	−0.001	0.002	0.003	0.002
% voting for Brexit, 2016	0.053	0.026[a]	−0.010	0.014	0.171	0.018[b]	0.065	0.024[b]
Incumbent	2.877	0.296[b]	2.955	0.221[b]	0.990	0.293[b]	0.332	0.290
Labour * party % share of electorate, t-1	−0.650	0.225[b]	0.124	0.115	0.104	0.149	−0.254	0.166
LibDem * % share of electorate, t-1	0.135	0.264	−0.990	0.113[b]	0.233	0.178	0.798	0.181[b]
Labour * campaign spend, t	−0.064	0.059	0.041	0.034	0.193	0.044[b]	0.346	0.053[b]
LibDem * campaign spend, t	0.026	0.042	−0.121	0.047[a]	0.019	0.034	0.347	0.044[b]
% share of elect, t-1 * % campaign spend t	0.002	0.002	0.007	0.002[b]	−0.005	0.002[a]	0.008	0.002[b]
Labour * squared % of elect t-1	0.012	0.006[a]	−0.003	0.002	−0.001	0.003	0.005	0.003
LibDem * squared % of elect t-1	−0.010	0.009	0.015	0.003[b]	−0.057	0.009[b]	−0.016	0.007[a]
Squared % of electorate t-1 * campaign spend t	−0.000	0.000	−0.0002	0.0000[b]	0.000	0.000	−0.0001	0.0000[b]
Labour * Brexit vote 2016	−0.096	0.037[a]	−0.147	0.021[b]	−0.133	0.028[b]	−0.016	0.037
LibDem * Brexit vote 2016	−0.031	0.033	−0.017	0.018	−0.183	0.024[b]	−0.061	0.029[a]
Brexit vote 2016 * campaign spend t	−0.001	0.000	−0.001	0.000[b]	0.001	0.000[b]	0.002	0.000[b]
Labour * % of elect t-1 * campaign spend t	0.009	0.005	−0.009	0.003[b]	0.002	0.003	−0.005	0.003
LibDem * % of elect t-1 * campaign spend t	−0.005	0.004	0.003	0.003	0.004	0.003	−0.015	0.003[b]
Labour * squared % of elect t-1 * campaign spend t	−0.000	0.000	0.0002	0.0001[b]	−0.000	0.000	0.000	0.000
LibDem * squared% of elect t-1 * campaign spend t	0.000	0.000	−0.000	0.000	0.0005	0.0001[b]	0.0002	0.0001[a]
Labour * % Brexit vote 2016 * campaign spend t	−0.001	0.000	0.001	0.000[b]	−0.004	0.000[b]	−0.004	0.001[b]
LibDem * % Brexit vote 2016 * campaign spend t	0.000	0.000	0.002	0.000[b]	−0.002	0.000[b]	−0.004	0.000[b]
R^2	0.921		0.968		0.976		0.968	
N	1687		1716		1708		1659	

[a] $p < 0.05$.
[b] $p < 0.01$.

a party's campaign effort on its constituency vote share will be unaffected by local levels of support for independence.

H4a. After the 2014 independence referendum, SNP constituency campaign efforts will be more effective the higher the local independence vote in the referendum.

H4b. After the 2014 independence referendum, Conservative, Labour and Liberal Democrat campaign efforts will be less effective the higher the local referendum support for independence.

2. Data and methods

In the following, we make a novel contribution to the literature by addressing the three issues raised above. We look not only at Labour and Conservative campaigns, but also at those of the Liberal Democrats and SNP. We employ an alternative measure of campaign intensity which is available for almost every candidate in almost every seat. And, for the first time to our knowledge, we examine the effects not only of the Brexit Referendum electoral shock but also of that produced by the Scottish independence vote.

Our analyses employ constituency data from the 2010, 2015, 2017 and 2019 UK General Elections. To provide the fairest test possible of Fisher et al.'s (2023) findings, we replicate their modelling strategy.[7] For each election year, we model the percentage share of the constituency electorate won by the Conservative, Labour and Liberal Democrat (in England and Wales) and SNP (in Scotland) candidate. This allows us to take into account the possibilities that the party's campaign activity will win over some who had previously voted for other parties and will attract individuals who might otherwise have abstained. The model for each election year pools data for the above parties: our unit of analysis is a party-constituency. Hence each constituency is represented three times (four in Scotland), in each model, once for each party. To estimate the result for each party, we include independent dummy variables for each party (the Conservative candidate in each seat serves as the comparison point), and we interact these party dummies with the other independent variables in the model. To take into account both the tendency for party support to be relatively stable over time, and to capture the effect of other influences on a party's local support, the models include a lagged dependent variable[8] to control for the party's share of the constituency electorate at the previous election (2005 for the 2010 results, 2010 for the 2015 election, and so on).[9] Following

[7] In using OLS regression, we differ slightly from Fisher et al., who employ beta regression. However, given that our models produce no out-of-range predictions, this does not substantially affect our results.

[8] Including a lagged dependent variable might increase the risks of downwardly biased coefficients for explanatory variables if model residuals are highly autocorrelated (Achen, 2000). But Keele and Kelly (2006) show that OLS models with an LDV (as used here) were superior to other models/estimators even when small residual autocorrelation was present and that large samples sizes were not required for good estimates. Through simulations, they noted that the effect of sample size works in the opposite direction than expected, with OLS producing the best estimates for modest instead of large sample sizes. Given the modest sample sizes of our models, this underscores the robustness of using OLS with an LDV. Keele and Kelly (2006, p. 203) conclude that if 'one suspects that history matters then OLS with an LDV model remains a good choice'.

[9] In England and Wales, constituency boundaries changed between the 2005 and 2010 elections, so 'previous election' results for the 2010 constituencies there are based on the BBC/ITN/Press Association estimates of the 2005 election constituency results had that contest been fought in the seats employed for the first time in 2010. In Scotland, the boundary changes took place prior to the 2005 election and the seats remained unchanged thereafter, so we are able to use the actual 2005 election results as our lagged dependent measure for the 2010 contests.

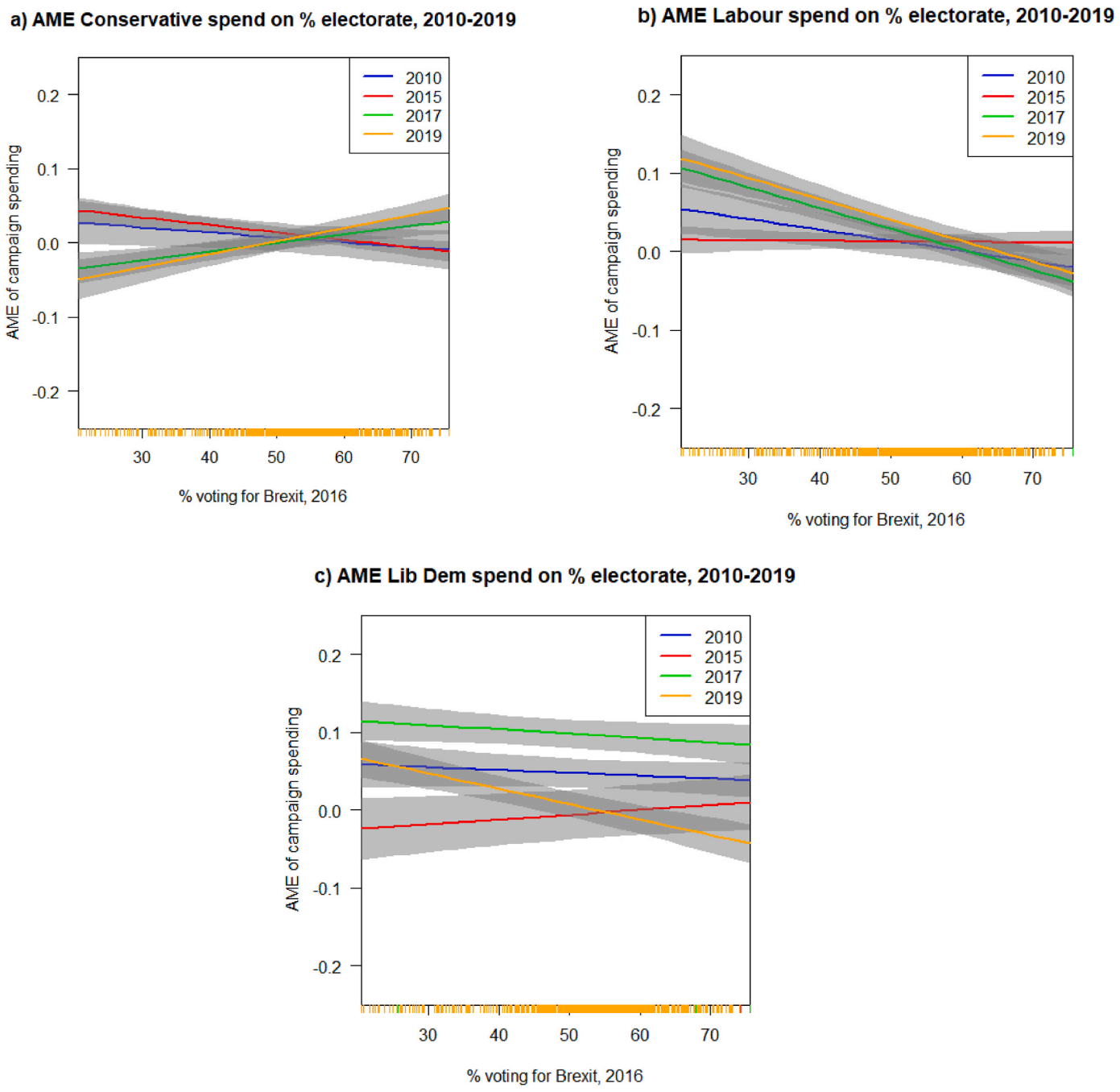

Fig. 1. Average marginal effect of party campaign spending on party % share of electorate, by % Brexit vote: England and Wales only (models from Table 1).

Fisher et al. (2023), we also control for the square of each party's previous share of the electorate. Where a party is locally unpopular, there are likely to be limits on how many more votes it can lose. And where it is very popular, there are probable limits on how many more votes it can feasibly win (Fieldhouse, Fisher and Cutts, 2020). Controlling for the squared share of the electorate gained by each party at the previous election takes this into account. As incumbent candidates and parties in a constituency often enjoy advantages over those trying to unseat them (Smith, 2013; Wood and Norton, 1992), we also control for whether each candidate's party had won the seat at the previous election.

Our measure of each party's constituency campaign activity in the models for that party is the amount spent by the party's candidate during the four-week 'short campaign' for each election. This is expressed as a percentage of the legal maximum candidates were allowed to spend in the seat (the cap is a function of how many electors are registered in the seat and of whether the constituency is a borough or a county seat, and it varies slightly from election to election). Candidates' spending is a good proxy for parties' local campaign efforts, correlating well with other independent measures of campaign activity, including estimates derived from surveys of election agents, party

activists and voters (Fieldhouse & Cutts, 2009; Johnston and Pattie, 2006; Pattie et al., 1994). The spending data also have the considerable advantage of comprehensive coverage. All candidates (or their agents) standing in United Kingdom general elections are legally required to report details of their campaign spending to the Electoral Commission, and the data are publicly available. Almost all candidates comply with this requirement, so we have a near-complete record of campaign intensity across all major parties and all seats for each election between 2010 and 2019. Only a few candidates' spending data were missing from the dataset.

We estimate impact of the Brexit and Scottish independence shocks by including a variable measuring the proportion of voters in each seat who voted either for Brexit or for Scottish independence (the latter in Scottish constituencies only): we fit separate models for the Brexit and for the Scottish independence vote effects. At both referendums, official results were released only for local government areas, and not (with a few exceptions) for the smaller parliamentary constituencies. Hence we rely on estimates of the referendum results at the constituency scale. For the Brexit vote, we utilise estimates made available by Professor Chris Hanretty and supplied as part of the British Election Study constituency results data file.[10] We have made our own estimates of constituency-level support for independence in Scotland at the 2014 referendum.[11]

Finally, the models include terms for the two- and three-way interactions between: party, previous electorate share and campaign spending; party, previous electorate share squared and spending; and party, support for Brexit or Scottish independence and campaign spending. The last set of interaction terms are key to our analysis, as they allow us to examine whether the effects of each party's campaign efforts on its levels of support at each election were affected by local levels of support for Brexit or independence. Crucially, if an 'electoral shock' influences the effectiveness of a party's campaigning efforts, we should see such an effect after the relevant referendum, but not before it. In the 'Brexit effect' models (and as outlined in H1, H2a and H2b above), support for Brexit locally should have little effect on each party's campaign effectiveness before the Brexit vote in 2016. But after the referendum we expect the positive effects of the Conservatives' local campaigns on their vote share become stronger as support for Brexit locally increases, with the opposite effect for Labour and the Liberal Democrats (their positive campaign benefits decreasing in size as Brexit support locally grows). Similarly, in the 'Scottish independence effect' models (see H3, H4a and H4b above), a similar 'shock effect' to that anticipated for Brexit should mean that support for Scottish independence had no impact on the effectiveness of each party's campaign efforts before 2014, but that, after the referendum, the SNP should receive increasing benefits from its campaign efforts, and Labour, the Liberal Democrats and the Conservatives decreasing benefits from their campaigns, as local support for independence rises.

The main 'Brexit effect' models are estimated on constituency results in England and Wales. Scottish constituencies are excluded from these analyses, as Scotland has a somewhat different party system (the SNP plays a larger role in Scottish politics than Plaid Cymru, the Welsh nationalist party, plays in Welsh politics, and there is no equivalent of the SNP in England). In addition, the substantial electoral shock engendered by the independence referendum in Scotland almost certainly contaminates any 'Brexit effect' on campaigning there in a way that would not be true south of the border. We do, however, run separate 'Brexit effect' models for Scottish constituencies in the 2015, 2017 and 2019 elections as a robustness check on the main 'Brexit effect' models: concentrating only on the post-independence referendum elections in Scotland for our analysis of the Brexit effect reduces the risk of the independence shock 'contaminating' any Brexit effect, as the 'independence shock' was already baked into Scottish voting by the time of the 2015 contest.

For the reasons discussed above, the 'Scottish independence vote' models were based only on data for Scottish constituencies in the 2010 and 2015 elections, before the Brexit vote (avoiding the risk of misspecifying as an 'independence shock' effect any consequences of the Brexit shock for campaigning in Scotland). In the following section, we present the results for our 'Brexit effect' analyses. The subsequent section does the same for our 'Scottish independence effect' models.

3. The Brexit 'shock' and campaign effectiveness

Our first set of models examine the impact of Conservative, Labour and Liberal Democrat constituency campaigns on their levels of support in the local electorate between 2010 and 2019 in England and Wales (Table 1).[12] We are particularly interested here in the effects of the parties' constituency campaigns on their support and how this was affected by the Brexit vote. To assess the impact of local Brexit support on each party's campaign effectiveness, we need to look in each year's model at not only the coefficients for campaign spending and for the

[10] The British Election Study constituency results file is available via the BES website, at https://www.britishelectionstudy.com/.

[11] To obtain constituency-level estimates of the percentage voting for independence, we ran a regression model on the local authority results for the referendum. The model estimates the local authority-level percentage vote for independence as a function of five variables selected from the 2011 Census: the percentage of the local population whose highest education qualifications were at level 2 (equivalent to GCSE A-C passes); the percentage whose highest educational qualifications were at level 3 (equivalent to A/AS and Higher level qualifications – essentially university entrance level); the percentage who identified as both Scottish and British; the percentage who identified as English, and the percentage who were unemployed. The model was a very good fit, with an R^2 value of 0.899. This yielded the following regression equation:% independence = 24.01 + 1.74*Level 2 Quals +1.85*Level 3 Quals – 1.62*Scottish & British – 1.86* English +2.46*unemployment. $R^2 = 0.899$.All the independent variables were significantly related to support for independence. Using constituency-level values for each of the independent variables, we then used the equation to calculate estimates of the independence vote in each constituency. We were able to cross-check our estimates in one area as Edinburgh City Council had, at the time of the referendum, released the results not only for the local authority as a whole, but also enumerated for each of the city's five constituencies. On average, the estimated independence vote shares were only 0.47 percentage points lower than the actual shares, though the varied from around 3 percentage points below the actual share (in Edinburgh South West) to about 3 percentage points above it (in Edinburgh North and Leith). That said, the relative differences between constituencies were the same for both the estimated and the actual results: our estimates gave the correct rank ordering for the five Edinburgh constituencies. Because support for independence was high both in areas where the SNP had previously been strong and in areas where they had not, the correlation between our Independence vote measure and the SNP's constituency vote share at the preceding election was low in both elections examined in the Independence vote analyses: the Pearson's correlation coefficient between them was 0.186 in 2010, and 0.132 in 2015.

[12] As our model specification includes not only the main effects of the key independent variables (campaign spending and Brexit/Independence vote: more generally, we might refer to variables x and z) but also both the previous share of the electorate and its square, and numerous two-and three-way interactions (xz) between many of the independent variables, these variables (e.g. x and z) are highly likely to be correlated with their product (xz), raising the spectre of multicollinearity. However, there are no adverse consequences for other variables in the model because the p-value for xz is not influenced by multicollinearity (Allison, 2012; Mclelland et al., 2017; Wooldridge, 2013). As Allison (2012) notes, centering does not change the coefficient value for the product or its p-value. As such, because we know that centering noticeably reduces collinearity, the fact that it doesn't influence the p-value of the product or interaction confirms that collinearity is not an issue. We have examined variance inflation factors (VIFs) for models focusing just on the main effects of the independent variables: in almost all cases, VIF statistics are well within conventionally accepted ranges (most VIFs are below 5 and only one exceeds 10), suggesting multicollinearity is not a major problem.

interactions between party and campaign spending, but also at the interaction terms for campaign spending and Brexit vote, and for campaign spending, Brexit vote and party.

Interaction terms are notoriously difficult to comprehend, however, and this is especially so in models involving three-way interaction, as here. So for each election year and each party, we use the models in Table 1 to calculate the average marginal effect (AME) of each party's constituency campaign spending at different levels of local support for Brexit in 2016 on its share of the constituency electorate in each election year (Fig. 1). The blue line in each graph shows the relevant AME for the 2010 election, the red line the AME for 2015, the green line that for 2017, and the orange line the 2019 AME: the shaded area around each line indicates the relevant 95% confidence intervals.

Consistent with the existing literature on campaign effects, most of the effects in Fig. 1 are positive. The harder a party campaigned locally, the greater the share of the electorate it might generally hope to win there, other things being equal.

More interesting for our purposes, however, are how the impact of each party's campaign efforts was affected by local support for Brexit, and how that changed over time. In 2010, six years before the Brexit referendum (and five years before David Cameron made an election promise to hold one), local levels of support for leaving the EU made little difference to the effectiveness of either the Conservative or the Liberal Democrats' campaigns (as indicated by the blue lines in Fig. 1a and c). In both cases, the slopes for the relevant campaign spending AMEs are basically flat or (in the case of the Conservatives), mildly declining as support for Brexit in 2016 rises. And though the Conservative 2010 AME slope is negative, its 95% CI indicates no real trend as local Brexit support rises: the negative trend in AME is within the bounds of random fluctuation. In other words, and consistent with H1, neither party's campaign effectiveness was related to local support for Brexit. Five years on in 2015, and again consistent with H1, local support for Brexit again seems to have had little impact on the effectiveness of the Liberal Democrat campaign (the red line in Fig. 1c is still flat). There was more sign of some influence on Conservative campaign effectiveness, though interestingly the party's campaign had a positive effect on its support in areas where Brexit would prove unpopular the following year, but almost no effect on its support in seats where Brexit was a clear majority option (Fig. 1a: the red 2010 AME trend line for the Conservatives is negative, and the AME is virtually 0 in seats where Brexit support was highest). In many of the latter seats, the Conservatives were, of course, being challenged by the strongly pro-Brexit UK Independence Party, which may explain why their campaign there seems to have afforded them little purchase (Goodwin and Milazzo, 2015).

After the Brexit referendum, and consistent with H2a, the AMEs for Conservative local campaigning in both the 2017 and 2019 elections were positively related to local levels of support for Brexit, showing the party's efforts were much more effective in seats where support for Brexit was high than in constituencies where it was low (Fig. 1a: the 2017 AME is picked out in green, and that for 2019 in orange). In the former constituencies at both elections, the harder the Conservatives campaigned, the greater their predicted share of the electorate. But where support for Brexit was low, the Conservatives' constituency campaign had a negative effect on their support at both the 2017 and 2019 elections (the harder the party campaigned in such places holding other factors constant, the less well it performed). Notably, at both elections, the Conservative campaign faced little real competition for Brexit supporters' votes. In 2017, UKIP fielded 378 candidates across the country, but received less than 2% of the vote. In 2019, the Brexit Party did not stand in Conservative-held seats. Hence the Conservatives were in a good position for their campaign to pick up extra support in areas where Brexit was more popular – and so they did.

There is some suggestion that the Liberal Democrats' post-Referendum campaigning was also affected by the local referendum result in 2017 and in 2019, in the direction predicted by H2b (the green and orange trend lines in Fig. 1c). In other words, the stronger local support for Brexit, the less of a positive advantage the Liberal Democrats gained from their campaigns. The effect is relatively muted in 2017 (the green line in Fig. 1c), and given the 95% confidence interval suggesting an effectively flat line, it could be read as non-existent in that year. Under their 2017 leader, Tim Farron, the Liberal Democrats found it hard to make their pro-Remain position count (Farron faced difficulties over his religious views regarding homosexuality, which may have affected his party's ability to attract support from progressive voters). It became much more pronounced in the 2019 General Election (the orange AME line in Fig. 1c), when the party enjoyed a positive campaign effect in areas where Brexit had been unpopular, but a clear negative campaign effect in areas where it was very popular. The extra impetus the Liberal Democrat 2019 campaign received in areas where Brexit was less popular was potentially helped by Remain voters who may well have been encouraged to vote Liberal Democrat rather than Labour in that election due to the latter party's (and its's leader, Jeremy Corbyn's) ambiguous position on Brexit in that election.

The effect of the Brexit shock on Labour's campaign effectiveness is less clear-cut, however (Fig. 1b). If we focus just on AMEs for Labour campaigning at the 2015, 2017 and 2019 contests (the red, green and orange lines respectively), the results are consistent with the 'shock' argument and with H1 and H2b. In 2015, before the Referendum, the AME for Labour campaign spending on share of the electorate is positive, more campaign effort equating to better predicted outcomes for the party. What is more, consistent with H1, the red 2015 AME trend line is more or less flat, with much the same AME whether local support for Brexit is low or high, suggesting similar marginal benefits to campaigning for Labour in both sorts of place. And in the two post-referendum elections, the models suggest that Labour's campaign had a clearly positive effect on its support in areas where most voted against Brexit, but a negative effect where most voted to leave the EU, consistent with H2b (the green and orange AME trend lines in Fig. 1b). But, and contrary to H1, the AME trend for Labour's campaign effect follows the same pattern (albeit only weakly so) in 2010 – positive impacts where Brexit support in 2016 was low, negative effect where it was high – even though this contest took place six years before the Brexit 'shock'. That said, the effect of local support for Brexit on the AME for Labour campaign spending is greater (indicated by the steeper AME slopes) in the two post-referendum elections of 2017 and 2019 than in 2010. To that extent, the comparison of the 2010 with the 2017 and 2019 campaigns are consistent with those reported by Fisher et al. (2023).

So far, our analyses provide broad support for Fisher et al.'s (2023) findings. But there are clear exceptions and anomalies, not least for Labour's 2010 campaign and for the Conservatives' 2015 campaign.

As a robustness check, the same Brexit shock models were estimated in Scottish constituencies for the 2015, 2017 and 2019 elections. As discussed above, we did not look at the 2010 election in Scotland, as any effect of the election shock arising from the 2014 independence vote there would be likely to affect comparisons between 2010 and 2015. This exercise turns out to be a salutary corrective to the sense that the preceding analyses generally confirmed Fisher et al.'s (2023) findings, and suggests the exact impact of electoral shocks on campaign effectiveness may be context-specific. The impact of the Brexit shock on the parties' constituency campaign effects seems to have been much more muted in Scottish constituencies than in England and Wales (Table 2 and Fig. 2). North of the border, the differential between the predicted impact of campaign spending by each party under conditions of strong and weak local support for Brexit are generally much harder to distinguish from each other. The AME campaign effectiveness trend lines for each party in Fig. 2 tend to be relatively flat and with relatively wide 95% confidence intervals, suggesting that on the whole campaign effectiveness in Scotland was unrelated to local support for Brexit.

While this is clearly distinctly at odds with Fisher et al.'s (2023) findings, two factors may account for this. First, while Fisher et al. (2023) controlled for whether a constituency was located in Scotland or England, they did not estimate separate models for Scottish seats. As the

Table 2
The effect of local support for Brexit on constituency campaign effects, 2015–2019: Scotland only.

	Y = % share of electorate, t					
Party:	2015		2017		2019	
	b	SE	b	SE	b	SE
Constant	0.023	4.612	−9.524	4.270[a]	−3.936	4.376
Labour candidate	−10.110	9.117	15.560	6.052[a]	14.297	6.050[a]
Liberal Democrat candidate	−4.147	5.837	11.678	4.782[a]	8.458	4.812
SNP candidate	25.824	12.048[a]	109.438	35.315[b]	−132.696	63.835[a]
% share of electorate, t-1	0.0893	0.483	3.384	0.909[b]	0.973	0.617
% campaign spend, t	−0.180	0.115	0.278	0.075[b]	−0.012	0.078
Squared % share of electorate, t-1	−0.007	0.023	−0.148	0.060[a]	−0.009	0.023
% voting for Brexit, 2016	0.051	0.105	0.170	0.074[a]	0.088	0.058
Incumbent	5.903	1.390[b]	4.887	1.433[b]	0.259	0.454
Labour * party % share of electorate, t-1	−0.272	0.711	−2.431	0.996[a]	−1.843	0.769[a]
LibDem * % share of electorate, t-1	−0.994	0.581	−2.806	1.001[b]	−0.720	0.734
SNP % share of electorate, t-1	0.175	1.212	−8.111	2.246[b]	12.209	5.344[a]
Labour * campaign spend, t	0.584	0.223[b]	−0.175	0.226	−0.111	0.157
LibDem * campaign spend, t	0.120	0.211	−0.290	0.157	0.048	0.096
SNP * campaign spend, t	0.060	0.203	−1.420	0.575[a]	1.681	0.910
% share of elect, t-1 * % campaign spend t	0.015	0.011	−0.033	0.012[b]	0.001	0.008
Labour * squared % of elect t-1	0.005	0.026	0.140	0.062[a]	0.060	0.028[a]
LibDem * squared % of elect t-1	0.022	0.026	0.126	0.063[a]	0.029	0.032
SNP * squared % of elect t-1	−0.030	0.041	0.222	0.067[b]	−0.240	0.111[a]
Squared % of electorate t-1 * campaign spend t	−0.000	0.000	0.002	0.001[a]	0.000	0.000
Labour * Brexit vote 2016	0.128	0.154	−0.266	0.406[a]	−0.165	0.081[b]
LibDem * Brexit vote 2016	0.089	0.124	−0.200	0.090[a]	−0.116	0.074
SNP * Brexit vote 2016	0.053	0.246	−0.382	0.180[a]	−0.206	0.157
Brexit vote 2016 * campaign spend t	0.001	0.002	−0.001	0.022	0.001	0.001
Labour * % of elect t-1 * campaign spend t	−0.029	0.017	0.021	0.022	0.017	0.012
LibDem * % of elect t-1 * campaign spend t	0.009	0.015	0.024	0.015	0.016	0.010
SNP * % of elect t-1 * campaign spend t	0.006	0.021	0.098	0.036[b]	−0.142	0.075
Labour * squared % of elect t-1 * campaign spend t	0.000	0.000	−0.001	0.001	−0.0006	0.0003
LibDem * squared% of elect t-1 * campaign spend t	−0.000	0.000	−0.001	0.001	−0.0005	0.0004
SNP * squared% of elect t-1 * campaign spend t	−0.000	0.001	−0.003	0.001[b]	0.003	0.002
Labour * % Brexit vote 2016 * campaign spend t	−0.005	0.003	0.003	0.002	0.000	0.001
LibDem * % Brexit vote 2016 * campaign spend t	−0.003	0.003	0.002	0.002	−0.003	0.002
SNP * % Brexit vote 2016 * campaign spend t	−0.003	0.004	0.003	0.002	−0.000	0.002
R^2	0.964		0.952		0.980	
N	236		235		236	

[a] $p \leq 0.05$.
[b] $p \leq 0.01$.

vast majority of British constituencies are located in England (only around 20% are in other parts of the country), unsurprisingly, English trends will tend to dominate their findings. Furthermore, it is also worth remembering, in this context, that Brexit was generally much less popular in Scotland than England and Wales. Only in a very few places did a majority of voters support it, and then not to the levels seen south of the border. In the average English and Welsh constituency, 53.5% had voted for Brexit in 2016, compared to only 38.2% in the average Scottish seat. Support for Brexit was also much more varied in England and Wales than in Scotland. The standard deviation in the per cent voting to leave the EU was 10.8% points in the former, but only 7.4% points in the latter. And while there was a 55.2% point difference in the Brexit vote between the most pro- and the most anti-Brexit constituencies in England and Wales, the equivalent range in Scotland was just 39.8% points. There were therefore fewer opportunities in Scotland for parties to develop substantially different appeals in strongly pro- or anti-Brexit areas than were available south of the border. The relative uniformity of anti-Brexit sentiment in Scotland compared to England and Wales mutes the potential for the Brexit shock to change the landscape of electoral campaigning in the former.

4. The scottish independence referendum 'shock' and campaign effects

In this section, we further extend the investigation of electoral shocks' influence on campaign effectiveness by considering the impact of the Scottish independence referendum 'shock' on campaigning in Scottish elections. We estimate similar models to those presented in the previous section, substituting estimates of the local level of support for independence in the 2014 referendum for Brexit support in 2016, and looking at effects both before the 2014 independence vote (at the 2010 election) and after it (at the 2015 election: Table 3 and Fig. 3). For the reasons given above, we exclude the 2017 and 2019 elections from these analyses.[13]

For three of the four parties' campaigns analysed here, there is clear support for H3. As revealed by the relevant AME trends for campaign spending by each party in the 2010 General Election (the blue trend lines in Fig. 3), local levels of support for independence as expressed four years later at the 2014 independence referendum had no discernible impact on campaign effectiveness. The 2010 AMEs for the Conservatives, Labour and the SNP were to all intents and purposes unchanged, no matter how much support there was local for an independent Scotland (all three blue trend lines in Fig. 3 are either flat or have 95% confidence intervals which imply that their slopes cannot be distinguished from a flat line).

In the case of the Liberal Democrats, however, things were not quite so clear-cut. The positive trend in the AME slope for the party's 2010 campaign efforts suggests their campaign that year had a more substantial positive impact on their share of the electorate where the pro-

[13] As noted in footnote 10, our constituency-level estimate of support for independence in 2014 is only weakly related to the SNP's constituency vote share in 2005 (r = 0.186) and 2010 (r = 0.132), the lagged SNP vote shares for the 2010 and 2015 models.

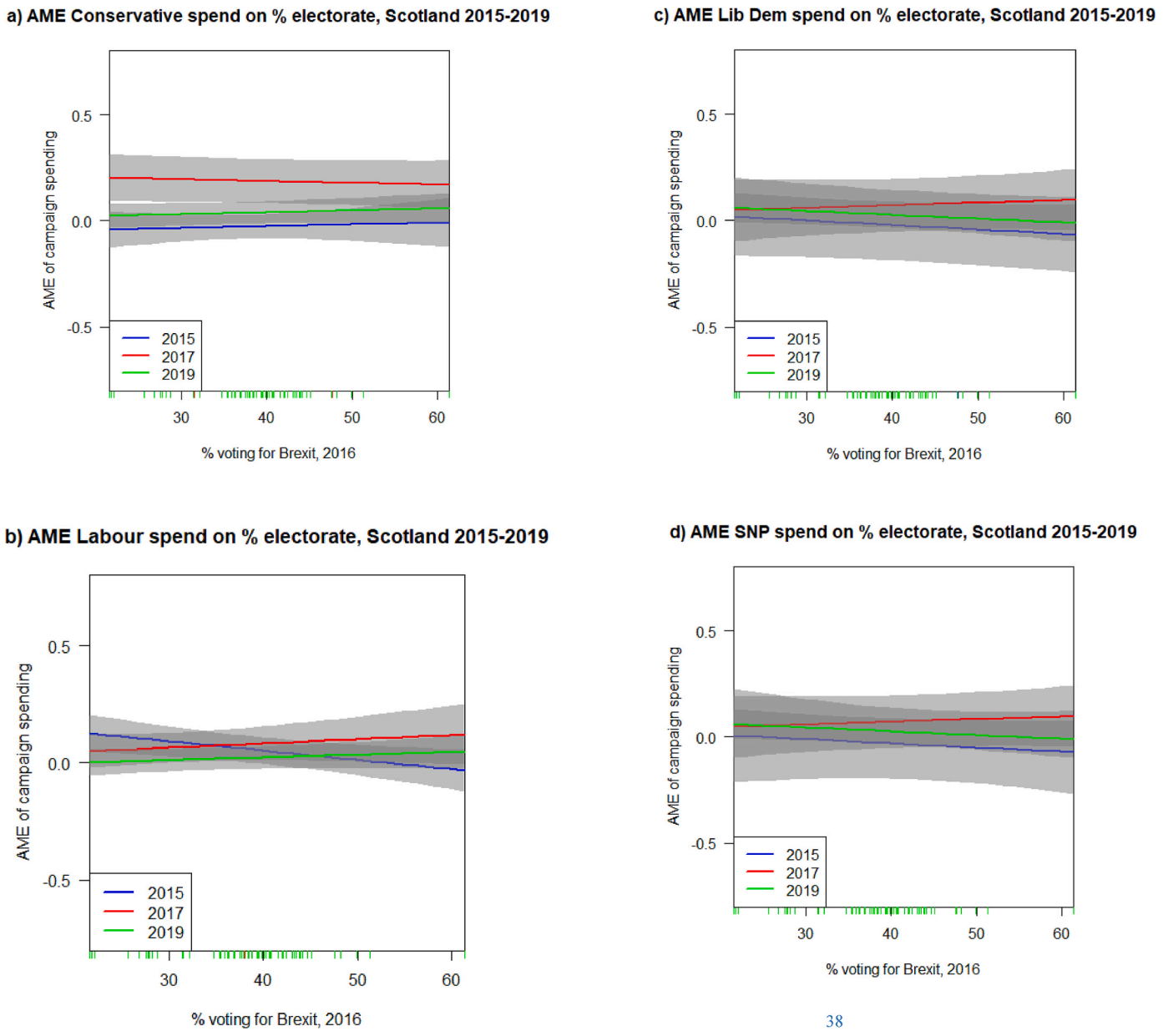

Fig. 2. Average marginal effect of party campaign spending on party % share of electorate, by % Brexit vote: Scotland only (models from Table 2).

independence vote was high than where it was low (and where support for independence was very low, harder Liberal Democrat campaigning might even have been associated with falling levels of support for the party). The effect was not surprising, given the party's relative stance on a wide range of issues. But it is worth noting that as the model controls for lagged party support at the preceding election, much of the underlying geography of support for the party is already taken into account, so we are not simply picking up greater purchase for the Liberal Democrats' campaign in more small 'l' liberal areas. That said, the effect is on the edge of conventional levels of statistical significance (the average AME for the Liberal Democrats at the lowest estimated level of support for independence is very close to the value of its lower 95% confidence interval at the highest level of local support for independence). Although the Liberal Democrat result seems to contradict H3, therefore, it does not do so unequivocally. On the whole, therefore, H3 is upheld.

There are signs that the electoral shock catalysed by the 2014 independence referendum impacted the effectiveness of two of the four parties' constituency campaigns, those of the Conservatives and Labour, at the subsequent 2015 General Election. In each case, the relationship between campaign spending and predicted shares of the electorate differed between areas where support for independence was low and where it was high (the relevant AME trends for 2015 are indicated by the red lines in Fig. 3). To that extent, the post-referendum results align with H4b. However, the detail is rather more complex.

The impact of the local independence vote on Labour campaigning is as predicted by H4b (Fig. 3b). Whereas the party's campaign efforts in 2015 had a positive effect on its predicted share of the electorate in constituencies where support for an independent Scotland was low, it had almost no effect in places where the previous year's 'Yes to Independence' vote had been high (where the estimated local vote for independence was above 45%, the 95% confidence interval for the Labour, 2015 AME includes zero).

But for the Conservatives, the independence 'shock' seems to have had the opposite effect on their campaign effectiveness to that expected (Fig. 3a). Their campaigns had a positive effect on their support levels in places where support for independence had been high and negative effects in places where the independence vote had been low. The 2015 election was challenging for the Scottish Conservatives. Already

Table 3
The effect of local support for Scottish independence on constituency campaign effects, 2010–2015: Scotland only.

	Y = % share of electorate, t			
Party:	2010		2015	
	b	SE	b	SE
Constant	−6.921	9.224	8.331	8.821
Labour candidate	15.047	12.204	−18.674	12.428
Liberal Democrat candidate	11.485	12.205	−1.948	9.900
SNP candidate	11.946	10.120	−18.100	14.746
% share of electorate, t-1	2.507	0.991[a]	0.906	0.513
% campaign spend, t	0.154	0.144	−0.594	0.227[b]
Squared % share of electorate, t-1	−0.130	0.067	−0.018	0.022
% voting for Independence, 2014	0.070	0.146	−0.126	0.149
Incumbent	3.490	1.032[b]	7.002	1.276[b]
Labour * party % share of electorate, t-1	−2.259	1.114[a]	−0.568	0.693
LibDem * % share of electorate, t-1	−2.024	1.066	−1.296	0.598[a]
SNP * % share of electorate, t-1	−1.819	1.261	0.823	1.186
Labour * campaign spend, t	−0.181	0.220	1.029	0.288[b]
LibDem * campaign spend, t	−0.408	0.192[a]	0.261	0.298
SNP * campaign spend, t	−0.167	0.165	0.826	0.279[b]
% share of elect, t-1 * % campaign spend t	−0.007	0.011	0.023	0.011[a]
Labour * squared % of elect t-1	0.148	0.069[a]	0.018	0.025
LibDem * squared % of elect t-1	0.126	0.069	0.038	0.024
SNP * squared % of elect t-1	0.136	0.074	−0.0033	0.040
Squared % of electorate t-1 * campaign spend t	0.001	0.001	−0.000	0.000
Labour * Independence vote 2014	−0.132	0.226	0.401	0.236
LibDem * Independence vote 2014	−0.117	0.169	0.057	0.167
SNP * Independence vote 2014	−0.108	0.185	0.834	0.261[b]
Independence vote 2014 * campaign spend t	−0.003	0.003	0.008	0.004[a]
Labour * % of elect t-1 * campaign spend t	0.009	0.016	−0.032	0.016[a]
LibDem * % of elect t-1 *campaign spend t	0.027	0.013[a]	0.006	0.015
SNP * % of elect t-1 * campaign spend t	0.014	0.016	−0.021	0.021
Labour * squared % of elect t-1 * campaign spend t	−0.001	0.001	0.000	0.000
LibDem * squared% of elect t-1 * campaign spend t	−0.001	0.001	−0.000	0.000
SNP * squared% of elect t-1 * campaign spend t	−0.001	0.001	0.000	0.001
Labour * % Independence vote 2014 * campaign spend t	0.004	0.003	−0.014	0.005[b]
LibDem * % Independence vote 2014 * campaign spend t	0.006	0.003	−0.005	0.005
SNP * % Independence vote 2014 * campaign spend t	0.003	0.003	−0.014	0.005[b]
R^2	0.956		0.969	
N	234		236	

[a] $p < 0.05$.
[b] $p < 0.01$.

unpopular, they (like other anti-independence parties) were facing further pressure from the SNP, newly buoyant after the independence vote. As a consequence, Conservative campaign spending in Scotland tended to be higher in the few areas where the party had been relatively popular, and where it was trying to stem the flow against it. This, we argue, explains the apparently puzzling result: the party was expending most effort defensively in places where it had most to lose – and where support for Scottish independence tended to be lowest.

Neither the Liberal Democrats' nor (more surprisingly) the SNP's 2015 campaigns were affected by local levels of support for independence, however (Fig. 3c and d). In both cases, the AME trend sloped in the opposite directions to our expectations in H4a and H4b. The AME for Liberal Democrats' 2015 campaign effort increased as local support for independence grew. That said, the AME was always negative, suggesting that the party's campaign effort that year in Scotland was associated with declining, not increasing support (as we might expect, given the negative fallout from the party's involvement in the 2010–2015 coalition government) – though to a lesser extent where independence was locally popular than where it was not.

For the SNP, too, the AME slope was negative, suggesting that, if anything, the party's campaign effort in 2015 yielded poorer results in seats where independence was most popular than in seats where it was least popular. And while the average AME for the SNP's 2015 campaign was generally positive in place where the estimated support for independence was below 45% (suggesting that greater effort by the SNP yielded more votes), it was negative where support for independence exceeded that level (suggesting that greater campaign effort was associated with fewer votes). In these seats, we suspect, the SNP would normally be expected to be doing particularly well after the referendum. Most voters who might switch to the party there would be independence supporters who did not need the extra blandishments of the constituency campaign to persuade them to do so. Hence SNP candidates in these 'high opportunity' seats after the referendum should have been quite confident of gaining many more votes, even if they did not campaign. Under such circumstances, they would only need to step up their local campaign activities if faced with serious challenges from other parties locally. Post-referendum, therefore, high levels of campaign spending by the SNP in strongly pro-independence seats would have been a sign of weakness, not of strength.

A closer examination of where the SNP and Scottish Labour concentrated their campaign efforts at the 2010 and 2015 elections, and how this was affected by local levels of support for independence in 2014 supports this interpretation (Table 4). At the 2010 election, four years prior to the referendum, SNP constituency campaign spending was unrelated to local levels of support for independence. But a year after the referendum, the party's 2015 campaign spending was related to the local 'Yes' vote. What is more, the relationship was quadratic. Although not a perfect fit by any means (there were, of course, many other factors which shaped the SNP's local campaigning, including the vagaries of local party enthusiasm and organisation), the form of the quadratic relationship shows that, on average, SNP campaign spending in 2015 was highest in seats where support for independence was either low or where it was high, and lowest in seats where it was about average. Many of the constituencies where support for independence proved highest in 2014 were central belt traditional Labour strongholds where the SNP's support prior to the referendum had tended to be below its national average. And Labour's campaign efforts tended to focus on those stronghold seats. Its campaign spending (in both 2010 and 2015) was positively (and linearly – the quadratic forms of the models proved insignificant in both years) related to the independence vote: the greater the support for an independent Scotland in a seat, on average, the greater the effort Labour put into its local campaign there, both before and after the referendum. In those seats where independence proved most popular, therefore, the SNP was starting from inauspicious beginnings and was faced by an incumbent in difficulties and fighting a rearguard campaign. Unsurprisingly, perhaps, the SNP found it increasingly difficult to benefit from its own efforts as local support for independence grew, as it was both moving into areas where it had previously not been a major player and was at the same time facing something of a rearguard action from the previously dominant local party.

Even more troublingly for H4a and H4b, the trends in the Liberal Democrat and SNP 2015 AME slopes were not only in the 'wrong' direction compared to our hypotheses, but were not statistically significant either. The 95% CIs around the AME trends were very wide, and the AME at the lowest levels of support for independence were within the interval for the AME at the highest levels of support for independence (and vice-versa). A possible concern might be that support for independence in the 2014 referendum might be closely related to the SNP's local vote share, creating potentially distorting collinearity effects. However, this is not the case: there is no correlation between the independence vote and the SNP's 2010 vote share ($r = 0.101$, $p = 0.445$), and only a weak negative correlation with the SNP's 2015 vote share (r

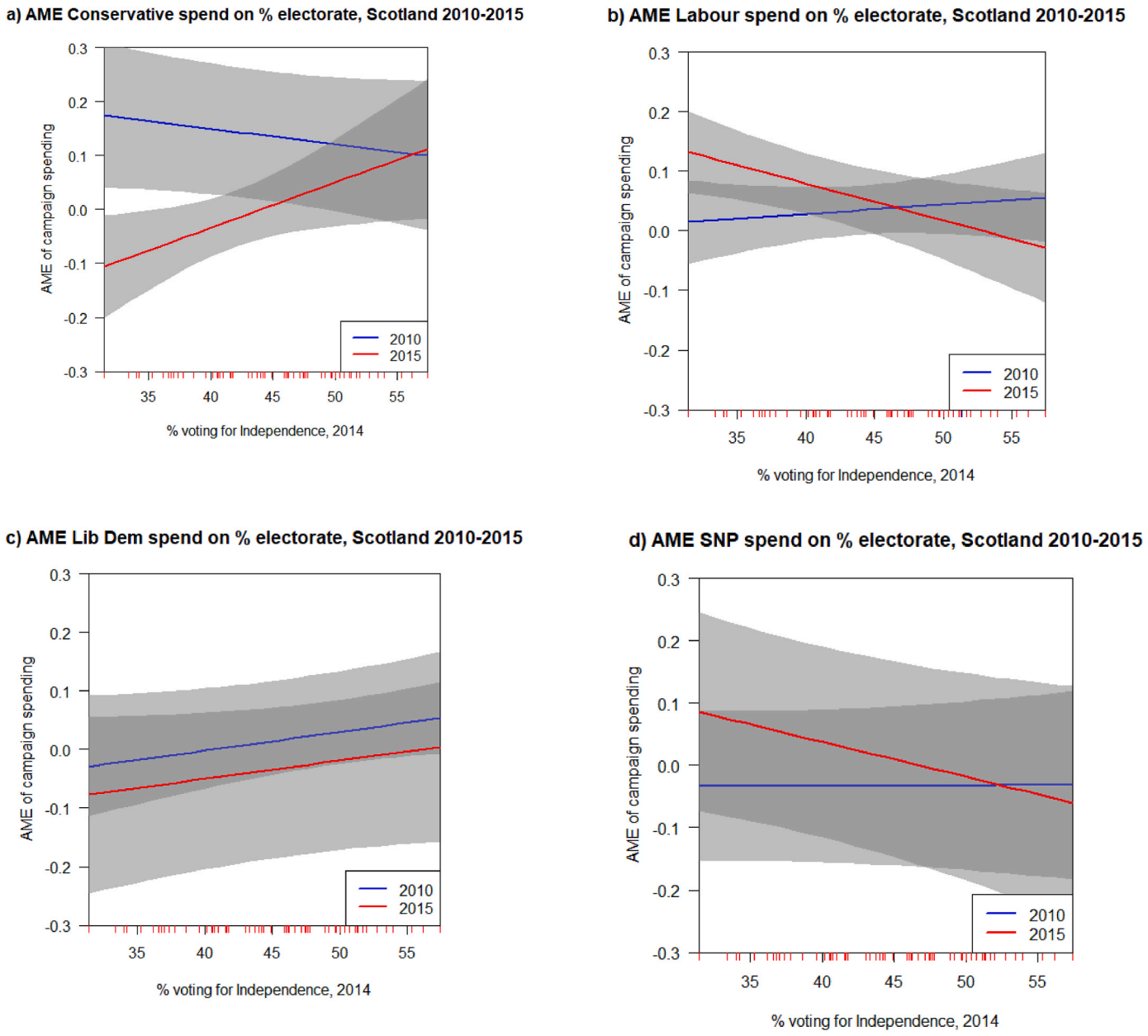

Fig. 3. Average marginal effect of party campaign spending on party % share of electorate, by % Independence vote: Scotland only (models from Table 3).

= −0.257, p = 0.050).

Overall, therefore, the effects of an election shock on campaign effectiveness in Scotland once again shows the importance of the particular context within which a campaign operates. The impact of the 'independence shock' on parties' campaign effectiveness in Scotland did not match that of the 'Brexit shock' in England and Wales. It is, however, worth noting that, as with the constituency-level Brexit vote in Scotland, the variation in local support for independence was also quite small compared to the variation in support for Brexit in England and Wales. The standard deviation for our constituency-level estimates of the independence vote was just 6.4% points, and the range was 26% points. With less variability of view on both issues across Scottish seats than was the case for Brexit among English and Welsh seats, there was less 'space' for electoral shocks arising from the two issues to affect the parties' local campaign effectiveness north of the border than south. Furthermore, as noted above, there is some evidence that the SNP's targeting of its local campaign effort was not as well-directed as it might have been to exploit the independence shock as much as possible: applying most effort in 2015 both in places where support for independence was high and in places where it was low meant benefits in pro-independence areas were balanced out by effects in anti-independence places.

5. Conclusion

Our analyses of the impact of the Brexit shock on campaign effectiveness in England and Wales for the most part confirm Fisher et al.'s (2023) assertion that major 'electoral shocks' can alter the effectiveness of parties' constituency campaign efforts in subsequent elections, with different parties' campaigns being affected in different ways. But the details of our results differ from theirs in some respects. And when we turn to the impact of 'electoral shocks' on campaigning in Scotland, we also see some evidence that electoral shocks can influence campaign effectiveness, as suggested by Fisher et al. (2023), albeit in more complex ways than initially thought. In this concluding section, therefore, we summarise our key findings, noting where they confirm Fisher et al.'s (2023) Brexit analysis, and where they suggest different effects from the

Table 4
SNP and Labour constituency campaign spending as a function of local support for Scottish independence, 2010 and 2015: Scotland only.

a) Linear models	Y = SNP Short campaign spending as % of legal maximum				Y = Labour Short campaign spending as % of legal maximum			
	2010		2015		2010		2015	
	b	SE	b	SE	b	SE	b	SE
Constant	25.608	23.668	102.464	20.905	−5.023	26.313	−27.540	30.290
% voting for Independence, 2014	0.403	0.524	−0.928	0.462[a]	1.351	0.582[a]	1.860	0.670[b]
R^2	0.0103		0.066		0.086		0.119	
N	59		59		59		59	

b) Quadratic models	Y = SNP Short campaign spending as % of legal maximum				Y = Labour Short campaign spending as % of legal maximum			
	2010		2015		2010		2015	
	b	SE	b	SE	b	SE	b	SE
Constant	88.307	151.813	462.630	124.149[b]	238.814	165.794	231.276	191.399
% voting for Independence, 2014	−2.480	6.915	−17.490	5.700[b]	−9.861	7.551	−10.045	8.718
Squared % voting for Independence, 2014	0.033	0.078	0.186	0.064[b]	0.126	0.085	0.134	0.098
R^2	0.013		0.189		0.121		0.147	
N	59		59		59		59	

[a] $p < 0.05$.
[b] $p < 0.01$.

English and Welsh Brexit shock, and we speculate on factors which could potentially account for the apparent differences.

In line with existing research, we find generally consistent evidence that parties' campaign efforts in a constituency do affect their electoral prospects there. For the most part, the harder they campaign on the ground, other things being equal, the better they tend to do.

Our main contribution here is to the further exploration of electoral shocks' impacts on the effectiveness of parties' constituency election campaigns. Like Fisher et al. (2023), we look at the 'Brexit shock'. The analyses reported above largely support their findings regarding its effects on Labour and Conservative campaigns in England and Wales. Both parties' local campaigns mostly had a positive effect on their support. But local levels of support for Brexit affected how much of an advantage they gained from that effort – and more so after the Brexit referendum than before. The higher the local support for Brexit, the weaker the benefits Labour received from their campaigning after the 2016 Brexit vote, and the greater the benefits the Conservatives enjoyed.

Extending our analyses to include the Liberal Democrats' efforts suggests that the effects of the Brexit shock were not restricted to the two larger parties' campaigns. The party's local campaigning did have a positive effect on its results, both before and after the Brexit referendum. The Liberal Democrats are historically the most pro-European of the three main parties, and they adopted an anti-Brexit stance after the referendum (they saw Brexit as a major mistake, argued before Brexit actually took place for a reversal of the decision to leave, and flirted with holding a second referendum). As expected, therefore, more intensive campaigning by the party did yield higher rewards post referendum in seats where Brexit was less popular, especially in 2019 (in line with H2b).

Things are not so clear-cut when we try to replicate the Brexit effect models in the rather different context of Scottish constituencies. Brexit was widely unpopular there, and there was less variation between constituencies in local levels of support. Perhaps as a result, there was less evidence of consistent 'Brexit shock' effects on party campaign effectiveness than had been the case in England and Wales. For the most part, the Scottish parties' campaigns were little affected by levels of local support for leaving the EU.

Extending the analysis to examine the impact of the independence referendum shock in Scotland provided some (though more mixed) support for Fisher et al.'s (2023) case – though again there are striking aspects to our findings which suggest on the particular context affected the shock's impact. The independence shock did seem to affect the local hearing some parties received for their campaigns. But this was not always in the directions we had expected, based on an assumption that all electoral shocks would affect party campaigning in the same way as the Brexit shock in England and Wales.

As the main 'owners' of the independence issue in Scottish politics, the SNP might have expected its campaigns to have increased cut-through after the 2014 referendum, and particularly where support for independence then was highest. We did uncover some effects, but not as we expected. Pre-referendum, SNP campaigns were generally ineffective and unrelated to local support for independence. But (contrary to our expectations) the same was true after the referendum too: local support for independence had no real impact on how effective the SNP campaign was. A possible explanation is that voters driven by support for independence were already likely to support the SNP irrespective of how intensely the party campaigned. Moreover, there is also a possibility that intense campaigning by the SNP might perversely primarily motivate anti-independence voters in these strongly pro-independence seats to turn out. Whatever the reason, however, this finding does not support H4b.

On the anti-independence side, Labour campaign efforts boosted their general election support. But post-referendum the higher the local support for independence the smaller the benefit Labour gained from their campaign effort. Indeed, we find evidence where support for independence was very high Labour effort had a detrimental (negative) effect on support (as predicted by H4b). But as noted above, the impact of the 'independence vote shock' on the post-referendum effectiveness of Conservative constituency election campaigns, while noticeable, ran in the opposite direction to our expectations. The higher local levels of support for independence had been in 2014, the better the Conservatives' returns to their campaign efforts.

Overall, then, the argument that electoral shocks will affect campaign efficacy is only partly supported by the example of Scotland's independence referendum shock. We have partial, but not complete support for H4a and H4b. The effects are not entirely consistent across all parties or across different (but we would argue comparable, at least in terms of their capacity to reshape the electoral landscape) shocks. And some run counter to initial expectations. But that notwithstanding, there are clearly shock 'effects'. Parties do not campaign in a vacuum: electoral shocks provide an extreme testing ground for that proposition, and the extent to which parties can gain a hearing for their campaigns seems to depend on how they are affected by such shocks. But the particular context of the electoral shock clearly matters, and parties may not always be able to best exploit the possibilities a given shock presents them with.

CRediT authorship contribution statement

Charles Pattie: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **David Cutts:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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