Wired voters: the effects of internet use on voters' electoral uncertainty

Wired Voters: The Effects of Internet Use on Voters' Electoral Uncertainty[1]

Introduction

A citizen's experience of politics in a representative democracy is shaped by the extent to which she/he is politically 'certain'. For those voters who have a strong sense of identification with a specific party, the act of voting is less a choice among competing alternatives than an opportunity to reaffirm one's partisanship.[2] However, for 'uncertain' voters, who consider two or more parties as potentially viable vote choices, the act of voting entails first discovering, and then expressing electoral preferences. Such individuals must make a selection from multiple (i.e. at least two) potential alternatives; meaning that their votes represent the outcome of uncertain and variable processes of deliberation regarding the merits of competitors for public office.

One aspect of electoral uncertainty that is much commented upon, but not well understood empirically, is the role of media: does information encountered when consuming news media influence voters' political calculations? Can media exposure 'persuade' undecided voters, or make decided voters less certain of their political preferences? A number of recent studies have highlighted the causal effect of the

[1] An Appendix to this article is available at http://whatever.org. A complete replication package is available at http://wherever.org.

[2] Cees van der Eijk and Mark Franklin, *Elections and Voters* (Hampshire: Palgrave McMillan, 2009).

media environment on vote choice, with several using similar methodological innovations to those developed in this paper.[3] The research presented here brings novel empirical evidence to bear on two specific questions: does using the Internet as a source of political information influence the electoral uncertainty of voters, and, if so, what is the overall direction of that influence?

We investigate these questions using data from the 2011 Irish general election campaign, one of Europe's most volatile post-war elections. Along with a volatile electorate, Ireland also has variable geographical distribution of broadband coverage – a quirk of Irish life that is vital to our research design. The difficulty of arguing that the Internet (or any media for that matter) exerts an independent 'effect' on its users is that the choice to go online is itself driven by an array of social, economic and political factors, which can also explain voter uncertainty.[4] This fact of life creates the epistemological problem of causal endogeneity. However, media choice is also

[3] Stefano Della Vigna, and Ethan Kaplan, 'The Fox News Effect: Media Bias and Voting', *Quarterly Journal of Economics*, 122 (2007), 1187-1234; Stefano Della Vigna, Ruben Enikolopov, Vera Mironova, Maria Petrova and Ekaterina Zhuravskya 'Unintended media effects in a conflict environment: Serbian radio and Croatian nationalism' National Bureau of Economic Research Working Paper No. 16989 (2011). Available from http://www.nber.org/papers/w16989, accessed 09 December 2012; Jonathan McDonald Ladd and Gabriel S. Lenz, 'Exploiting a Rare Communication Shift to Document the Persuasive Power of News Media', *American Journal of Political Science*, 53(2009), 394-410; Ruben Enikolopov, Maria Petrova, and Ekaterina Zhuravskaya, 'Media and Political Persuasion: Evidence from Russia', *The American Economic Review*, 101 (2011), 3253-85; Holger Lutz Kern and Jens Hainmueller, 'Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes', *Political Analysis*, 17 (2009), 377–99.

[4] Pippa Norris, *The Digital Divide*. (Cambridge: Cambridge University Press, 2001); Zizi Papacharissi, and Alan M. Rubin. 'Predictors of Internet Use', *Journal of Broadcasting & Electronic Media*, 44 (2000), 175-96.

driven by technological availability: if a media source is unavailable to an individual, then by definition she/he cannot select it as a news source. A quasi-random variation in broadband availability allows us to tackle what Mondak [5] refers to as a fundamental barrier to demonstrating media effects. In his words,

> *"If media truly are a nearly all-pervasive force, then we are left with a variable that does not vary. Largely for precisely this reason, researchers have struggled to demonstrate the existence of media effects on political behaviour. Methodological leverage on a question evaporates when there exists no contrast group, no persons who are not exposed to the variable of interest."*

Variation in levels of broadband penetration in the Irish territory provides such a control group of citizens who are not exposed to the variable of interest (i.e. high speed internet). Therefore, we develop an availability-based natural experiment employing an instrumental variables modelling approach that, we argue, allows us to treat online newsgathering as an independent variable, and political certainty as a dependent variable in our analysis. The take-away message of our study is that browsing the Internet for political news during the 2011 Irish general election campaign led to discernibly higher levels of political uncertainty among voters. Specifically, going online made a voter significantly more likely to consider multiple parties as viable vote choices. Our results hold for different operationalizations of voter uncertainty and for different model specifications.

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[5] Jeffrey J. Mondak. *Nothing to Read: Newspapers and Elections in a Social Experiment* (Ann Arbor: University of Michigan Press, 1995), p.159.

In the next section, we provide some context on the Irish case, before outlining our theoretical expectations and empirical hypotheses regarding the relationship between Internet use and electoral certainty. Subsequently, we describe the data and methodology used to test these hypotheses, before presenting the results of our analysis – as well as a series of tests confirming the robustness of our core finding. We conclude with a discussion of the implications of our results for understanding how the Internet impacts electoral behaviour.

The 2011 Irish Election

The data gathered for this study pertain to the 2011 Irish election. The reasons for selecting the Irish case were twofold. First, we were able to avail ourselves of data that facilitates the causal modelling of Internet effects (as detailed in the next section). Second, and more importantly, the 2011 Irish election was by far the most volatile in Irish history and it also ranks among the most volatile elections in West European history.[6] The result saw the collapse of the seemingly rock-solid electoral dominance of Fianna Fáil, which had been firmly entrenched as the leading party in Irish electoral politics since its first victory in 1932. To those who follow Irish politics closely, however, the result was not a surprise. The last months of the outgoing administration saw an unprecedented conflagration of economic, fiscal and

[6] Michael Gallagher, 'Ireland's Earthquake Election: Analysis of the Results' in Michael Gallagher and Michael Marsh, eds., *How Ireland Voted 2011: The Full Story of Ireland's Earthquake Election*, (Dublin: Palgrave McMilland, 2011) pp. 139-72; Peter Mair, 'One of Europe's Most Volatile Elections' available at www.politicalreform.ie (posted Feb 28th, 2011), accessed 03 December 2012.

employment crises, which culminated in an Irish 'bailout', and the imposition of strict conditionality by the 'troika' of the European Union (EU), the European Central Bank (ECB), and the International Monetary Fund (IMF). As these crises unfolded from late 2008 onwards, the government parties (Fianna Fáil and the Green Party) saw their popularity plummet, and, as the results in Table 1 show, all of the opposition parties, as well as several Independents, benefitted from newly available electoral support, with Fine Gael and Labour making the greatest gains.

Table 1. 2011 Irish general election results.

Party	Seats	% 1st Pref	% Swing 2007
Fine Gael	76	36.1	8.8%
Labour Party	37	19.4	9.3%
Fianna Fáil	**20**	**17.4**	**-24.1%**
Independent	15	12.6	6.8%
Sinn Féin	14	9.9	3.0%
Green Party	**0**	**1.8**	**-2.8%**
Socialist Party	2	1.2	0.6%
People Before Profit Alliance	2	1	1.0%
South Kerry Independent	0	0.2	0.2%
Workers' Party	0	0.1	0.0%
Christian Solidarity Party	0	0.1	0.0%

Note: Incumbent government parties in bold.

Long before the results that led 2011 to be described as Ireland's 'earthquake election'[7] Marsh had made the argument that 'a majority of (Irish) voters appear to

[7]Gallagher, 'Ireland's Earthquake Election: Analysis of the Results'.

be open to persuasion according to the balance of short-term forces'[8] and Kroh et al.'s comparative study[9] ranked Ireland's population among the most politically uncertain of the 15 pre-2004 European Union member states. Despite a series of relatively stable electoral outcomes in past decades, the Irish electorate has exhibited a substantial latent potential for electoral change for quite some time.[10] The 2011 election was unusual in that the shock of economic collapse catalyzed the political uncertainty of the Irish electorate into an exceptionally high level of aggregate electoral change. Importantly for the research presented here, the campaign itself was also marked by a substantial increase in use of the Internet by candidates, parties, media, and voters, relative to the previous election in 2007.[11] The web was effectively a politically relevant medium during the campaign.

The Internet and Political Uncertainty: Theory and Hypotheses

[8] Michael Marsh, 'Party identification in Ireland: An insecure anchor for a floating party system', *Electoral Studies*, 25 (2006), 489 – 508, p. 491.

[9] Martin Kroh, Wouter van der Brug, and Cees van der Eijk. 'Prospects for electoral change', in Wouter van der Brug and Cees van der Eijk, eds, *European elections and domestic politics: Lessons from the past and scenarios for the future (Contemporary European politics and society)*, (Notre Dame: University of Notre Dame Press, 2007), pp. 209-26.

[10] van der Eijk and Franklin, *Elections and Voters;* Kroh, van der Brug and van der Eijk, 'Prospects for electoral change'.

[11] Matthew Wall and Maria Laura Sudulich, 'Internet Explorers. The On-line Campaign', in Michael Gallagher and Michael Marsh, eds., *How Ireland Voted 2011: The Full Story of Ireland's Earthquake Election*, (Dublin: Palgrave McMilland, 2011) pp. 89-106.

Levels of political uncertainty are not static, either across national populations or within them over time. The highly stable, *frozen* party-system scenario of Western Europe in the late 1960s, as described by Lipset and Rokkan,[12] was driven by the capacity of parties to structure political competition along stable societal cleavages and to thus align themselves with clearly defined segments of electorates. In a series of roughly contemporaneous studies in the United States, both the 'Michigan' and 'Columbia' schools also found partisan attachment to be a highly fixed aspect of political life, with Campbell et al.[13] arguing that '[O]nly an event of extraordinary intensity can arouse any significant part of the electorate to the point that its established political loyalties are shaken'.

However, since that time, levels of electoral uncertainty have increased steadily in established democracies around the world. Indicators of this trend include: growth in levels of aggregate electoral volatility,[14] growth in the proportion of individuals who indicate that they are highly likely to vote for more than one party,[15] an erosion of party membership numbers,[16] declining levels of self-reported partisan identification

[12] Seymour Martin Lipset and Stein Rokkan, *Party Systems and Voter Alignments: Cross-national perspectives*, (Toronto: The Free Press, 1967).

[13] Angus Campbell, Phillip E. Converse , Warren E. Miller , and Donald Stokes, *The American Voter*, (Chicago: The University of Chicago Press, 1967), p. 151.

[14] Russell J. Dalton. and Martin P. Wattenberg, eds. *Parties without Partisans: Political Change in Advanced Industrial Democracies*, (Oxford: Oxford University Press: 2000).

[15] Kroh., van der Brug, and van der Eijk. *Prospects for electoral change*.

[16] Richard S. Katz and Peter Mair, eds, *Party organizations: a data handbook on party organizations in western democracies, 1960-90*, (London: Sage, 1992).

in surveys,[17] increases in the numbers of electoral late deciders,[18] and decreases in the predictive power of socio-economic characteristics and of ideological self-placement for individual-level models of vote choice.[19]

Although a marked decline in partisanship has thus been noted in numerous studies of established democracies across the globe, relatively little is currently known about the factors that either foster or inhibit political certainty at the individual level. For instance, Mayer, in his edited collection on American 'swing voters'[20] notes: 'as far as I can determine, there is not a single journal article and just one book devoted to the subject'. Some of the classic U.S. voting behaviour literature does touch on the subject of electoral uncertainty, concluding that vote switchers are comparatively uninformed about politics[21]. Zaller[22] refines this position, arguing that individuals

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[17] Russell J. Dalton, 'The Decline of Party Identifications' in Russell J. Dalton. and Martin P. Wattenberg, eds. *Parties without Partisans: Political Change in Advanced Industrial Democracies*, (Oxford: Oxford University Press, 2000), pp. 9-37.

[18] Ian McAllister, 'Calculating or Capricious? The New Politics of Late Deciding Voters' in David Farrell and Rudiger Schmitt-Beck, eds. *Do Political Campaigns Matter? Campaign Effects in Elections and Referendums*, (London: Routledge, 2002), pp. 22-40.

[19]Wouter van der Brug, 'Structural and Ideological Voting in Age Cohorts', *West European Politics*, 33 (2010), pp. 586-607; Mark N. Franklin, , Thomas T. Mackie and Henry Valen, eds. *Electoral Change: Responses to Evolving Social and Attitudinal Structures in Western Nations*, (Cambridge: Cambridge University Press, 1992).

[20] William G. Mayer, 'What Exactly is a Swing Voter? Definition and Measurement' in William G. Mayer, ed., *The Swing Voter in American Politics*, (Washington, D.C.: Brookings Institution Press), pp. 1 - 32, p. 1.

[21] Campbell, Converse, Miller and D. Stokes, *The American Voter*; Phillip E. Converse, 'Information Flow and the Stability of Partisan Attitudes', *Public Opinion Quarterly*, 26(1962), 578-99; Joseph Trenaman and Dennis McQuail, *Television and Political Image*, (London: Methuen, 1961).

with moderate levels of political information and knowledge are in fact the most open to being influenced by political information. From a European perspective, however, Daudt and van der Eijk and Niemöller [23] find little evidence to support the hypothesis that 'floating' or 'swing' voters are any less (or more) politically informed than loyal partisans in the Dutch population. Indeed, Kroh et al.'s individual-level analysis [24] suggests that political attentiveness may in fact be *negatively* related to uncertainty, though this finding is not consistent across all models.

Among the factors that have been discussed as possible causes of partisan dealignment, the media environment has consistently loomed large. For instance, Dalton[25] argues that a growth in the availability of news from independent broadcast media along with an array of societal changes (especially in terms of education levels) provide modern voters with both more politically diverse information and greater cognitive capacity to process this information than their forbearers enjoyed. Kroh et al. [26] find that TV news consumption, in concert with several other individual- and national-level factors, plays a significant part in determining individuals' levels of political uncertainty.

Clearly, information is vital to political decision-making, including vote choice. However, the communication of information requires a medium. Each type of

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[22] John Zaller, *The Nature and Origins of Mass Opinion*, (NewYork: Cambridge University Press, 1992).

[23] Harry Daudt, *Floating voters and the floating vote*, (Leiden: Stenfert Kroese, 1961); Cees van der Eijk and Broer Niemoller. *Electoral change in the Netherlands: empirical results and methods of measurement*, (Amsterdam: CT Press, 1983).

[24] Kroh, van der Brug, and van der Eijk. *Prospects for electoral change*.

[25] Dalton, 'The Decline of Party Identifications'.

[26] Kroh, van der Brug and van der Eijk, 'Prospects for electoral change'.

medium has its own distinctive technological advantages and limitations, which dictate the type of information that is imparted to the voter, or – to borrow McLuhan's more evocative phraseology – the medium is the message.[27]

A body of empirical literature demonstrates that traditional media use and voting behaviour are related, finding that exposure to television news, radio and newspapers has significant effects on key electoral behaviours and perceptions: turnout,[28] efficacy[29] and vote choice.[30] Other studies have established a causal relationship between public opinion on a range of topics and exposure to traditional media.[31] How the Internet contributes to determining citizens' political views and behaviour remains overlooked in the literature.

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[27] Marshall McLuhan, *Understanding Media*, (New York: Signet Books, 1964).

[28] Kees Aarts and Holli A. Semetko, 'The Divided Electorate: Media Use and Political Involvement', *The Journal of Politics*, 65 (2003), 759-84.

[29] Susan Banducci and Jeffrey Karp, 'How Elections Change the Way Citizens View the Political System: Campaigns, Media Effects and Electoral Outcomes in Comparative Perspective', *British Journal of Political Science*, 33 (2003), 443-67.

[30] Della Vigna and Kaplan, 'The Fox News Effect: Media Bias and Voting' Della Vigna et al., **'**Unintended media effects in a conflict environment: Serbian radio and Croatian nationalism'; McDonald Ladd and Lenz, 'Exploiting a Rare Communication Shift to Document the Persuasive Power of News Media' Enikolopov, Petrova and Zhuravskaya, 'Media and Political Persuasion: Evidence from Russia'.

[31] Heinz Brandenburg, and Marcel van Egmond, 'Pressed into Party Support? Media Influence on Partisan Attitudes during the 2005 UK General Election Campaign', *British Journal of Political Science*, 42 (2012), 441-63; Danny Hayes and Matt Guardino, 'The Influence of Foreign Voices on US Public Opinion', *American Journal of Political Science*, 55 (2012), 830-50; Kern and Hainmueller, 'Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes' McDonald Ladd and Lenz, 'Exploiting a Rare Communication Shift to Document the Persuasive Power of News Media'.

The advent of the Internet as a widely available technology in the 1990s, and its more recent 'Web 2.0' incarnation,[32] has dramatically advanced the fragmentation of the modern voter's media environment.[33] However, the direction of an Internet 'effect' on voter uncertainty is not clear *a priori*. Two schools of thought have characterized the broader debate on the effect that the Internet may have on political information and political engagement, and we use the arguments and research proposed by each school to develop two alternative empirical hypotheses.

The first school of thought on the Internet and its political effects comprises several scholars[34] who have argued that the Internet is a medium that facilitates *selective exposure* of content, leading users to reinforce their pre-existent beliefs. They argue that the pull-in nature of the Internet leads individuals to explore the web by searching among information sources and *loci* that are already in line with their preferences. Rather than an open market square, such a view depicts the Internet as a collection of private members' clubs, where the likelihood of bumping into outsiders

[32] Paul Anderson, 'What is Web 2.0? Ideas, technologies and implications for education', *JISC Technology & Standards Watch*, 2007. Available from http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf, accessed 12 December 2012.

[33] David Tewksbury and Jason Rittenberg, *News on the Internet: Information and Citizenship in the 21st Century (Oxford Studies in Digital Politics)*, (Oxford: Oxford University Press, 2012).

[34] Bruce A. Bimber and Richard Davis, *Campaigning online: The Internet in US elections*, (New York: Oxford University Press, 2003); Diana C. Mutz, and Paul S. Martin, 'Facilitating Communication across Lines of Political Difference: The Role of Mass Media', *American Political Science Review*, 95(2001), 97-114; Cass Sunstein, *Republic.com*, (Princeton, NJ: Princeton University Press, 2001); Cass Sunstein, *Republic.com 2.0*, (Princeton, NJ: Princeton University Press, 2012); Trenaman and McQuail, *Television and Political Image*.

is practically nil. Furthermore, Pariser[35] argues that the Internet's extensive reliance on targeted advertising and automated personalization software creates 'filter bubbles', where users are exposed primarily to content that reflects their prior choices and dispositions, without necessarily realizing that this is the case. Generally, this view would lead us to expect that Internet exposure/use serves to confirm voters' prior preferences. Empirically, we test this contention by specifying the following hypothesis:

> **H_1**: Internet use for newsgathering during a political campaign is associated with lower levels of political uncertainty among voters, *ceteris paribus*.

Opposing the line of thought encapsulated in H_1 are a number of studies[36] which indicate that use of the Internet can challenge traditional social boundaries by exposing users to alternative opinions, views and sources. While habit and prior preferences do play a significant part in determining one's online news experience, it appears that exposure to dissonant views still occurs on the word wide web. For instance, Garret et al.[37] found that Americans' use of attitude-consistent online sources positively correlates with consumption of attitudinally challenging sources.

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[35] Eli Pariser, *The Filter Bubble: What the Internet Is Hiding From You*, (New York: Penguin Press, 2011).

[36] Robert Putnam, *Bowling alone. The Collapse and Revival of American Community*, (New York: Simon & Schuster, 2000); Pippa Norris, *A Virtuous Circle: Political Communications in Postindustrial Societies*, (New York: Cambridge University Press, 2000); Norris, *The Digital Divide*.

[37] R. Kelly Garrett, Dustin Carnahan and Emily K. Lynch, 'A Turn Toward Avoidance? Selective Exposure to Online Political Information, 2004–2008', *Political Behavior*. Published online 06 November 2011. Available from DOI: 10.1007/s11109-011-9185-6, accessed 09 December 2012.

Tweksbury and Rittenburg[38] characterize the findings of empirical studies on news selectivity as indicating that, for Internet news consumers, 'selectivity occurs through a mixture of purposeful evaluation of sites and topics and healthy doses of habit and chance'. Furthermore, the Internet hosts content that is both more voluminous and more diverse (in terms of fragmentation of content creators) than the content available in 'traditional' media. These considerations would lead us to anticipate that exposure to diverse information online should lessen voters' political certainty. This logic leads us to specify an alternative hypothesis:

> **H_2**: Internet use for newsgathering during a political campaign is associated with higher levels of political uncertainty among voters, *ceteris paribus*.

Extant research on empirical patterns of web use indicates that the Internet is a medium where users do frequently encounter content that challenges their prior preferences. A number of contributions point towards such a scenario: Gentzkow and Shapiro find that web users frequently browse websites that feature content that runs contrary to their ideological leanings, leading them to conclude that 'the Internet is far from segregated'.[39] Valentino and co-authors, by means of a lab experiment, demonstrate that is not uncommon for citizens to seek out information that challenges their attitudes and opinions.[40] Furthermore, Gibson and McAllister's

[38] Tewksbury and Rittenberg, *News on the Internet*, p. 68.

[39] Matthew Gentzkow, and Jesse M. Shapiro, 'Ideological Segregation Online and Offline', *The Quarterly Journal of Economics*, 126 (2011), 1799-1839, p. 1801.

[40] Nicholas A. Valentino, Antoine J. Banks, Vincent L. Hutchings and Anne K. Davis, 'Selective Exposure in the Internet Age: The Interaction between Anxiety and Information Utility', *Political Psychology* 30 (2009), 591-613.

study[41] of the Australian 2004 general election concludes that 'online election news seekers are more independently minded than other voters'.

Research Design

In this research, as in many other studies of individuals, organizations and societies, we confront a fundamental problem of causal inference: the impossibility of observing the counterfactual, i.e. the outcome for the same unit in the absence of the treatment.[42] The ideal scenario from a methodological standpoint would be a random assignment of the possibility of browsing political news online to individuals, i.e. a true experiment. Given random assignment, we could simply compare the two groups.[43] The difference between the average levels of electoral uncertainty for the treated group and the average level of uncertainty for the control group would constitute the causal effect of Internet newsgathering, since both groups would be comparable with respect to observed and unobserved confounding factors. However,

[41] Rachel Gibson and Ian McAllister, 'Does cyber campaigning win votes? Online communication in the 2004 Australian election', *Journal of Elections Public Opinion and Parties* 16 (2006), 243–63, p. 256.

[42] Kosuke Imai, Luke Keele, Dustin Tingley and Teppei Yamamoto, 'Unpacking the Black Box of Causality: Learning about Causal Mechanisms from Experimental and Observational Studies', *American Political Science Review*, 105 (2011), 765-89.

[43] Kosuke Imai, Dustin Tingley. and Teppei Yamamoto. 'Experimental Designs for Identifying Causal Mechanisms', *Journal of the Royal Statistical Society Series A (Statistics in Society)*, 176 (2013); Donald B. Rubin, 'Estimating causal effects of treatments in randomized and nonrandomized studies', *Journal of Educational Psychology*, 66 (1974), 688-701.

this ideal scenario is not feasible with observational data drawn from a representative sample of society at a given point in time. Simply put, browsing for political news online is not randomly assigned to individuals.

One approach to addressing this issue is to control for those characteristics that are likely to affect both the probability of going online and political uncertainty. For instance, we could use multivariate regressions or matching techniques employing a set of control variables. However, this would not help us with the problem of selection on unobserved factors that are correlated with the treatment and the outcome variable. This selection effect would induce correlation between the dependent variable and the error term, which undermines causal inference.

In this context, instrumental variables can be an effective identification strategy. We exploit the fact that broadband coverage is geographically variable in the Republic of Ireland during the period under investigation. By instrumenting patterns of Internet newsgathering (our treatment) on the basis of broadband coverage (our instrument), we can estimate a treatment effect by finding a control group that is similar enough to the treatment group in all the covariates, except that it does not enjoy broadband coverage. In this way, our methodological approach facilitates the identification of our treatment's effect on the dependent variable (i.e. the electoral uncertainty of individual voters). Moreover, we include in our models a number of elements that previous studies have found to be related to voter uncertainty, in order to further mitigate the issue of endogeneity.

Data

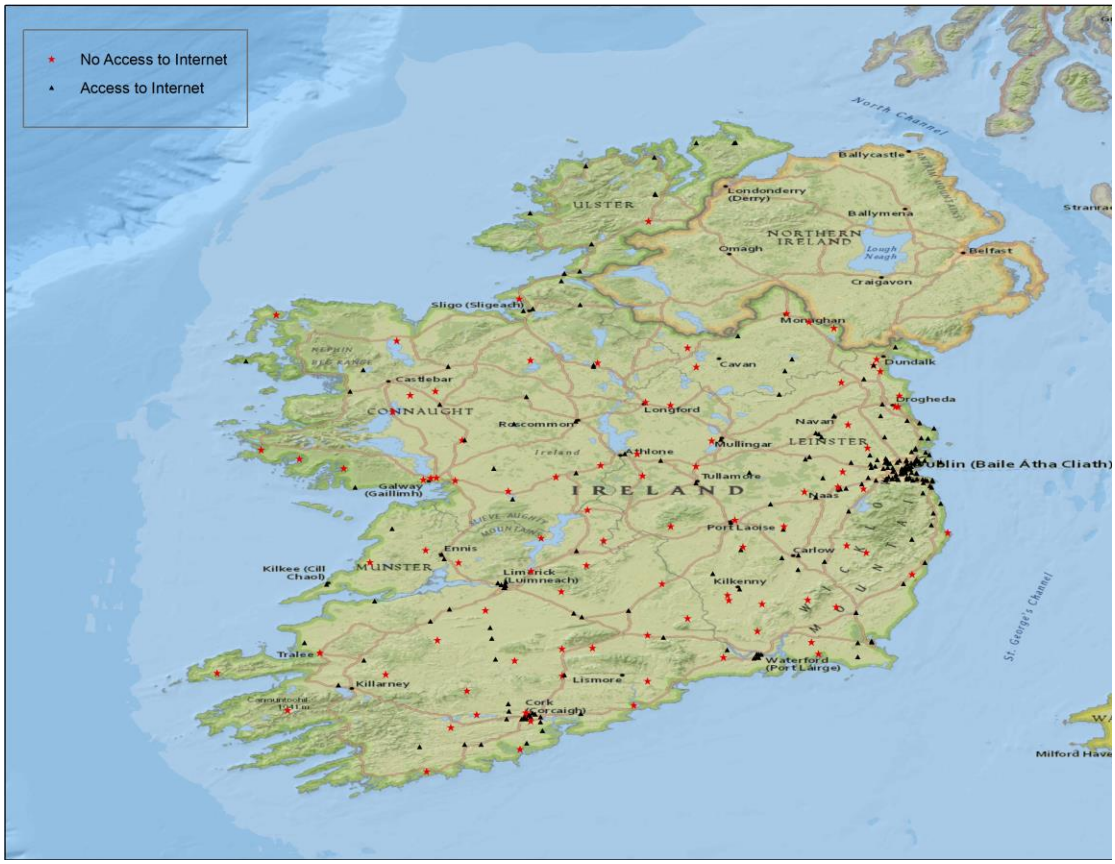
We use data from the INES 2011, the third national election study conducted in the Republic of Ireland.[44] In order to perform our analysis, we first created a new individual-level variable for the INES 2011 dataset, *broadband coverage*, which accounts for the availability of broadband to each respondent. First, we encoded the location (latitude and longitude) of all respondents, and we then performed a search for broadband coverage in each respondent's geographical location.[45] The 1,854 respondents to the INES 2011 lived in 309 different geographical locations (*i.e.* an average of six respondents per location in the survey). For those locations where all sources indicated no broadband coverage, we also performed a final check by searching for the keywords 'location+broadband' on google.ie.[46] Figure 1 maps the geographical distribution of the *broadband coverage* variable in the Republic of Ireland. Red dots are locations where respondents did not have broadband coverage, whereas black dots represent the locations of respondents who lived in areas with broadband availability.

[44] The 2011 INES is only a post-election survey; a pre-election wave was not run.

[45] We searched for broadband coverage in each location by consulting information on broadband availability supplied by major providers and, additionally, by using an online service that provides detailed information on broadband coverage by location (getbroadband.ie). This website was accessed by the authors between October 2011 and December 2011. The INES survey was run between January and March 2011.

[46] For all those locations whose name was present in more than one county we used 'location+broadband+constituency'. Finally, we dropped from the analysis those respondents who live in a village without broadband coverage and who nonetheless look at political news online more than twice a week.

Figure 1. Geographical distribution of Broadband Coverage.



Dependent variable

The dependent variable in this study is the level of electoral uncertainty of individual voters. As this study takes place in a multiparty system, the operationalization of electoral uncertainty is complex, and in this section we therefore outline the rationale behind our two measures of electoral uncertainty. We impute two metrics from our data: the first of these, *Potential for Switching*, is designed to capture an individual's potential for vote switching between their two most-preferred parties. The second metric, *Openness*, employs data from voters' evaluations of all of the major parties competing in a given election. Both measures rely on a well-developed survey

instrument that captures voters' orientations towards parties via a battery of items on their 'propensity to vote' (PTV) for each party. The PTV question from the 2011 INES reads:

> "*How probable is it that you will ever give your first preference vote to the following parties? Please use the numbers on this scale to indicate your views, where '1' means 'NOT AT ALL PROBABLE' and '10' means 'VERY PROBABLE'* ".

Kroh et al.[47] define likely switchers as those respondents who either have two or more parties tied for their highest probability score, or whose second preference is only one point less than their first. This approach generates a binary measure, taking the value of '1' for likely switchers and the value of '0' for non-switchers.[48] Table 2 displays the proportion of likely switchers in the Irish population as measured according to this metric in the three election-year INES studies (2002; 2007; 2011).

Table 2. Proportion of potential switchers over three INES studies.

	% Switchers	% Non switchers
2002	50.7	49.3
2007	51.5	49.5
2011	50.3	49.7

[47] Kroh, van der Brug and van der Eijk. 2007.'Prospects for electoral change'.

[48] We do not use this variable in out inferential analysis for two reasons: firstly, its binary form does not account for possible important differences among those considered to be 'switchers'. Secondly, this dichotomous measure is very sensitive to changes in the number of observations, potentially leading to blurry results.

Kroh et al.[49] develop a continuous measure of the degree to which a voter is certain of voting for their most-preferred party – and we employ this measure as our first dependent variable, '*Potential for Switching*', in our analysis. This measure is obtained by computing the difference between each respondent's two most-preferred parties. This figure is then multiplied by -1; the variable thus ranges from -10 to 0, where -10 indicates a high degree of certainty that the respondent will vote for their most preferred party and 0 indicates that they are equally likely to vote for at least two parties.

We complement *Potential for Switching* with a second dependent variable operationalization, *Openness*. The *Openness* index is an adaptation of the Herfindahl-Hirschman (hereafter HH) index. The HH index and revised forms of it (inverse and/or normalized versions) have already been used extensively in political science analyses. For instance, the index has been adapted to measure the extent of societal fragmentation of states[50] and for the well-known 'effective number of parties' measure of vote and seat fragmentation.[51]

We compute Openness using a normalized version of the Herfindahl-Hirschman index as follows:

$$HH^* = 1 - \sum_{i=1}^{10} (x_i)^2 \quad (1),$$

[49] Kroh, van der Brug and van der Eijk. 'Prospects for electoral change'.

[50] For a detailed discussion, see Alberto Alesina, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg, 'Fractionalization', *Journal of Economic Growth* 8 (2003), 155–94.

[51] Markuu Laakso and Rein Taagepera, 'Effective number of parties: a measure with application to West Europe', *Comparative Political Studies*, 12 (1979), 3-27.

where $(x_i)^2$ is the PTV of each party divided by the total of all the probabilities filled in by respondents. This variable ranges between 0 and 1. For instance, a respondent who gives a PTV of 10 to party X and a PTV of 0 to all the remaining parties would have an HH equal to 1. The more closely the HH value approaches 0, the greater the extent to which the respondent is divided between multiple parties. In order to make our discussion of the *Openness* index more intuitive, we reverse the HH metric score; so that high values correspond to higher levels of electoral openness. Thus, for both measures of our dependent variable, an increase in the value of the metric indicates an increase in an individual's level of electoral uncertainty.

Treatment

We code a binary variable *Internet* that takes the value '1' for respondents who browse online for news at least once per week and '0' for respondents who never go online for news. The set of respondents who browse online news is defined as the treatment group, whereas the set of respondents who do not go online is defined as the control group.[52] Specifically, our treatment is built on the following question from the INES survey:

> "*On a scale of 0-7 where 0 means 'never', 1 means one day a week, 2 means two days a week, and so on until 7 means 'every day' of the week, how often do you browse online for news*".

We recoded this ordinal variable as a dummy to facilitate the interpretation of our results. We could also think of browsing online news as an ordinal treatment, but that

[52] Paul R. Rosenbaum, *Observational studies.* 2nd edition, (New York: Springer, 2002); Rubin, 'Estimating causal effects of treatments in randomized and nonrandomized studies'.

would further complicate the identification strategy.[53] In the Appendix we show that this coding decision does not affect our results. In our dataset, 311 respondents report that they go online to browse political news.

Control Variables

To reduce the danger of confounding factors driving our results, we include a large number of control variables. In specifying our models we follow Kroh et al.[54] In particular, we begin with a baseline model that includes only *Socio-Economic Status* variables. Then we enrich this parsimonious model by including two additional sets of variables: *Political Involvement*; and *Political Attitudes and Opinions.*

Socio-Economic Status characteristics include age; gender; education; and social class. In terms of *Political Involvement*, we include variables accounting for individuals' party identification (which is negatively related to political uncertainty); frequency of watching political television; of reading newspapers; of listening to the radio; and political attentiveness. Regarding *Political Attitudes and Opinions*, we include left-right self-placement and extremeness; a variable capturing whether the respondent voted for Fianna Fáil in the previous elections; a variable distinguishing between vote as duty versus vote as choice; and a variable that scores one if the respondent agrees with a statement claiming that voting matters. Finally, we include

[53] Guido W. Imbens, and Jeffrey M. Wooldridge, 'Recent developments in the econometrics of program evaluation', *Journal of Economic Literature*, 47 (2009), 5-86; Kern and Hainmueller, 'Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes'.

[54] Kroh, van der Brug and van der Eijk. 'Prospects for electoral change'.

a variable capturing whether a candidate visited the respondent during the campaign. Descriptive statistics of these variables are included in the Appendix to this article.

Identification Strategy

Traditional techniques such as linear OLS regression are limited in their capacity to establish causation because they fail to control for endogenous causal relationships between independent and dependent variables. Internet use, the purportedly independent variable in our study, is indeed endogenous to several of the individual-level characteristics that we use to predict uncertainty in vote choice. We therefore estimate our model by instrumenting patterns of Internet use on the basis of Internet availability and a set of covariates.[55] We do so by implementing Two-Stage-Least-Squares (2SLS) estimations on the two dependent variables discussed above.[56] According to Abadie[57], several nonparametric assumptions allow one to identify causal effects in an instrumental variable (IV) model. First, and most importantly, a crucial requirement is that the area in which a respondent lives is 'as good as

[55] Our research design thus incorporates a similar identification strategy to: Manudeep Bhuller, Tarjei Havnes, Edwin Leuven and Magne Mogstad, 'Broadband Internet: An Information Superhighway to Sex Crime?' Institute for the Study of Labour Discussion Paper No. 5675. Available from http://ftp.iza.org/dp5675.pdf , accessed 12 December 2012; Enikolopov, Petrova, Zhuravskaya, 'Media and Political Persuasion: Evidence from Russia'; Kern and Hainmueller 'Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes'.

[56] As the first equation outcome is dichotomous, we opted for the TREATREG estimates. IVREG2 estimates are reported in the Appendix.

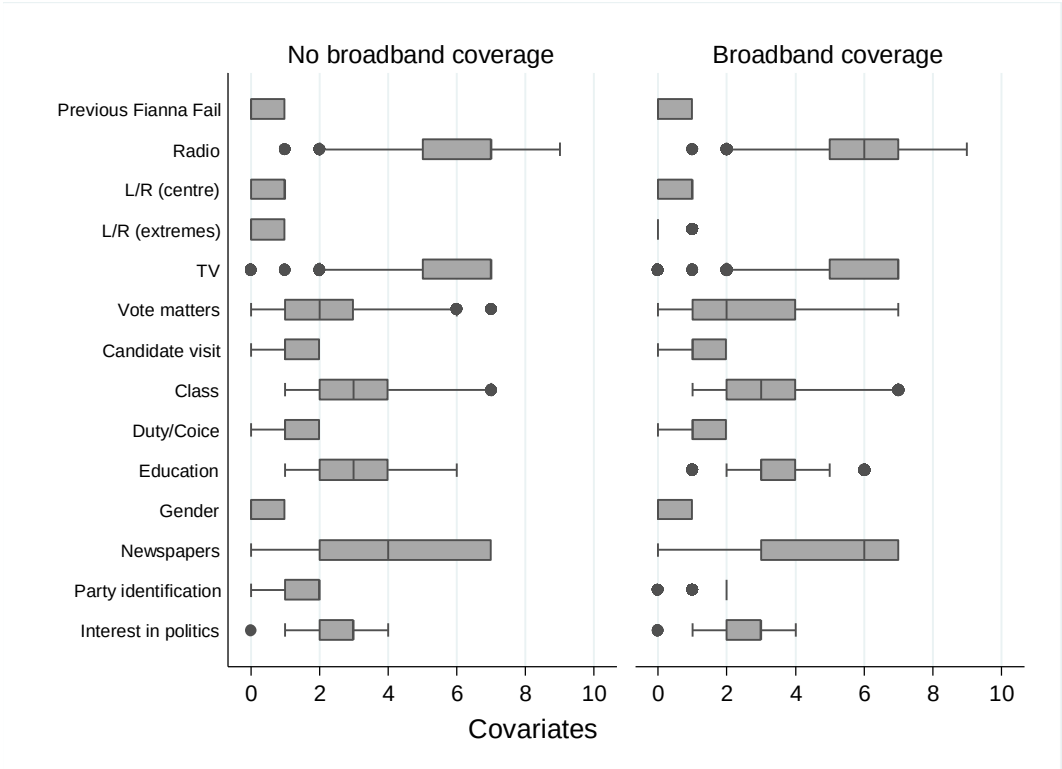
[57] Alberto Abadie, 'Semiparametric instrumental variable estimation of treatment response models', *Journal of Econometrics* 113 (2003), 231–63.

randomly assigned', once we condition on control variables. Moreover, and relatedly, our instrument, i.e. *broadband coverage*, should explain the variation of the dependent variable only through its effect on our treatment, i.e. *Internet*. These two assumptions together imply that, once we control for a set of covariates, living in an area without broadband *per se* should only impact on a respondents' electoral certainty via their capacity and propensity to gather news on the Internet.

A way to make sure that these two assumptions are met is to show that areas with broadband coverage are similar to areas without coverage in relation to characteristics that might affect our outcome variables. Our advantage is that we can check an extensive number of individual-level characteristics that are available from the 2011 INES survey. Here we concentrate on a limited number of these characteristics, focusing on the variables that we employ as controls in our analytical models. An analysis of balance across a larger number of variables can be found in the Appendix. As Figure 2 shows, areas with broadband and areas without broadband are broadly well-balanced in relation to confounding factors.[58]

[58] The graph does not include age, which does not scale with the other variables. The distribution of age is balanced, with a median of 43 for the group with broadband and 45 for the group without. 25th and 75th percentiles are 34 and 60 years for the group without broadband coverage and 32 and 57 for the group with broadband coverage.

Figure 2. Box plots of the covariate distribution in areas with and without broadband coverage



The variables that display a slightly diverse distribution between the two groups are: party identification (the ratio of party identifiers versus non-identifiers is about 7% higher for the areas with broadband coverage); education; and self-placement on the left-right dimension.[59] However, these differences between the treatment and control groups are relatively minor, and we deal with them in the Robustness Checks section. Overall, there is little evidence that differences among areas with and without broadband coverage could invalidate the exclusion restriction.

A second assumption requires that broadband coverage is a strong instrument for browsing for political news. In other words, broadband coverage must be highly

[59] A T-test shows that for both variables [mean(Z_0)–mean(Z_1)] is not statistically different from zero at the conventional level.

correlated with Internet use, conditional on the set of control variables. Table 3 below shows that living in an area with broadband coverage (according to our *broadband coverage* variable) is strongly correlated with the probability of 'browsing for political news online' (our *Internet* variable).[60] The correlation between the variables is 0.41. Moreover, when we regress *broadband coverage* on *Internet*, controlling for a large number of covariates, exposure is statistically significant and the t-statistic is larger than 10.[61]

Table 3. Browsing political news and broadband coverage.

Browsing political news online (days per week)	Leaving in	
	Areas without broadband coverage	Areas with broadband coverage
0	425	945
1	21	52
2	19	41
3	0	56
4	0	47
5	0	35
6	0	30
7	0	83
Total	465	1,289

A final assumption underlying our analytical approach requires no inverse relationship between Internet exposure and browsing for political news. Given that broadband exposure greatly facilitates Internet use generally, and the strongly

[60] We speculate that some respondents browse political news when they are not at home, i.e. at work, or that they browse political news online using mobile phones, while others may have broadband access but little interest in current affairs.

[61] As suggested by Joshua D. Angrist and Jörn-Steffen Pischke *Mostly Harmless Econometrics: An Empiricist's Companion*. (Princeton: Princeton University Press, 2012), pp.217-18, we employ some commonly used tests with instrumental variables. Specifically, in all the analyses the Kleibergen-Paap test shows that our models are *not* under-identified. Similarly, the Cragg-Donald Wald F statistic (also known as Stock-Yogo test) shows that our models are *not* weakly identified.

positive relationship between 'exposure' and 'broadband' observed in our data, we argue that our instrument meets this assumption.[62]

Analysis

We begin by estimating the baseline models (*Socio-Economic Status)* for both of our dependent variables. Then we add two other sets of control variables: *Political Involvement* and *Political Attitudes and Opinions*.[63] Table 4 reports coefficients and confidence intervals for parameter estimates of both the first stage and the second stage of our models for *Potential for Switching* and *Openness*.

[62] We acknowledge that people may access the Internet via 3G devices and/or access internet at the workplace. However, as long as 3G use or accessing the Internet from work is not systematically related to broadband access, our effects should still be identified. What is more, such a possibility may run against our effect. Indeed, if people in places with no broadband availability have other means of accessing the Internet, our effects should be underestimated.

[63] As we add covariates, we lose observations due to missing values.

Table 4 TREATREG: *Internet* instrumented using *Broadband Coverage*. The reference category for Left/Right placement (L/R) is those who did not place themselves (Don't know). Robust C.I. in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)
	Potential for vote switching			*Openness*		
Internet	**1.14*** **	**1.13*** **	**1.35*** **	**0.04*** **	**0.04*** **	**0.04*** **
	(0.42 - 1.86)	**(0.38 - 1.89)**	**(0.52 - 2.19)**	**(0.02 - 0.06)**	**(0.02 - 0.06)**	**(0.01 - 0.06)**
Socio-Economic Status						
Gender	-0.01	0.06	-0.02	-0.00	-0.00	-0.00
	(-0.22 - 0.19)	(-0.15 - 0.27)	(-0.27 - 0.22)	(-0.01 - 0.00)	(-0.01 - 0.00)	(-0.01 - 0.00)
Education	0.14***	0.15***	0.13**	0.00**	0.00***	0.00***
	(0.04 - 0.23)	(0.05 - 0.25)	(0.01 - 0.25)	(0.00 - 0.01)	(0.00 - 0.01)	(0.00 - 0.01)
Age	-0.01***	-0.01***	-0.02***	-0.00***	-0.00***	-0.00***
	(-0.02 - -0.01)	(-0.02 - -0.00)	(-0.03 - -0.01)	(-0.00 - -0.00)	(-0.00 - -0.00)	(-0.00 - -0.00)
Class	-0.03	-0.02	-0.05	0.00	0.00	0.00
	(-0.10 - 0.05)	(-0.09 - 0.06)	(-0.14 - 0.04)	(-0.00 - 0.00)	(-0.00 - 0.00)	(-0.00 - 0.00)
Political Involvement						
TV		-0.03	0.00		-0.00	0.00
		(-0.09 - 0.04)	(-0.08 - 0.08)		(-0.00 - 0.00)	(-0.00 - 0.00)
Newspaper		0.07***	0.07**		0.00***	0.00***
		(0.02 - 0.12)	(0.01 - 0.12)		(0.00 - 0.00)	(0.00 - 0.00)
Radio		0.04	-0.01		-0.00	-0.00
		(-0.02 - 0.10)	(-0.08 - 0.06)		(-0.00 - 0.00)	(-0.00 - 0.00)
Party Identification		-0.97***	-0.85***		-0.02***	-0.01***
		(-1.23 - -0.71)	(-1.14 - -0.56)		(-0.03 - -0.01)	(-0.02 - -0.01)

Interest in Politics		-0.14*	-0.07		-0.01***	-0.01**
		(-0.28 - 0.00)	(-0.23 - 0.10)		(-0.01 - -0.00)	(-0.01 - -0.00)
Candidate Visit		-0.01	0.04		-0.00	-0.00
		(-0.19 - 0.16)	(-0.18 - 0.25)		(-0.00 - 0.00)	(-0.01 - 0.00)
Political Attitudes and Opinions						
Vote Matters			0.02			0.00***
			(-0.05 - 0.09)			(0.00 - 0.01)
L/R (Centre)			0.29			0.01**
			(-0.12 - 0.70)			(0.00 - 0.02)
L/R (Extremes)			0.02			0.00
			(-0.44 - 0.47)			(-0.01 - 0.01)
Duty vs Choice			0.22			0.00
			(-0.06 - 0.50)			(-0.00 - 0.01)
Previous Fianna Fáil			0.25**			0.01***
			(0.01 - 0.50)			(0.00 - 0.02)
Broadband coverage	1.00***	0.99***	0.90***	1.00***	0.98***	0.89***
(*first stage*)	(0.79 - 1.22)	(0.77 - 1.21)	(0.66 - 1.14)	(0.78 - 1.22)	(0.77 - 1.20)	(0.65 - 1.13)
Constant	-1.99***	-2.05***	-2.45***	0.79***	0.80***	0.77***
	(-2.67 - -1.32)	(-2.86 - -1.24)	(-3.63 - -1.27)	(0.78 - 0.81)	(0.78 - 0.82)	(0.74 - 0.80)
Observations	1,754	1,710	1,321	1,754	1,710	1,321

The statistical significance (with 99% confidence) of the Internet effect is constant across the two dependent variables, which indicates that browsing online for news has an impact on electoral certainty, *ceteris paribus*. The direction of this effect is positive, implying that those who used the Internet for gathering politically relevant information in the 2011 Irish election campaign were more electorally uncertain – a finding that supports H_2, and invalidates H_1. These outputs also show that the variable accounting for online newsgathering (*Internet*) has a wide confidence interval, meaning that the amount of extra uncertainty determined by using the Internet for political news is difficult to specify precisely.[64] The coefficient for online newsgathering shows that online information (versus no use of the Internet for political news) corresponds to an increase of about one unit on the categorical measure of *Potential for vote switching* (which ranges from -10 to 0). The coefficient for the *Openness* measure indicates that using the internet makes voters 4% more 'open' to multiple parties, *ceteris paribus*. However, looking at these coefficients in relation to other variables in the models is more meaningful. Therefore, we briefly discuss these under the following three categories: *Socio-Economic Status; Political Involvement;* and *Political Attitudes and Opinions*.[65]

First, in terms of *Socio-Economic Status*, age and education are significant predictors of electoral openness and potential for switching. Age, as expected, is negatively

[64] The standard error of an IV estimate is usually much larger than that of an OLS estimate (Wooldridge, 2009).

[65] Several control variables have small coefficients that approximate to zero if we use two decimal places.

related to electoral certainty – a finding that is in line with several previous studies,[66] while educational attainment is positively related to uncertainty. Gender and class, on the other hand, have no statistically discernible effect – a finding that chimes with Kroh et al.'s (2007) comparative study.

The *Political Involvement* variables seek to capture the influence of other media, general levels of political interest and party identification on electoral uncertainty. The effect of reading a newspaper is positive and significant, while watching TV fails to reach conventional significance levels.

The magnitude of the effect of Internet on the outcome variables is also substantial, when compared to other media. For instance, gathering news online affects voters' certainty three times more than reading newspapers for both dependent variables. [67]

The negative sign of the coefficient for *Interest in Politics* suggests that those who assess themselves as being more interested in politics have more stable vote preferences and less electoral openness to multiple parties. Our outputs also indicate that, as expected, party identification is negatively related to political uncertainty.

Finally, being visited at one's home by candidates standing for election does not have an impact on the dependent variable, which is surprising given the importance ascribed to door-to-door canvassing by candidates in Ireland's 'pre modern'

[66] Converse, 'Information Flow and the Stability of Partisan Attitudes'; Mark N. Franklin, *Voter Turnout and the Dynamics of Electoral Competition in Established Democracies Since 1945*, (New York: Cambridge University Press, 2004); Kroh, van der Brug and van der Eijk, 'Prospects for electoral change'.

[67] To ease the comparison across variables we transformed TV, Radio and Newspaper into dummies. Coefficients are TV (-0.75), Radio (-0.10), Newspaper (0.34) for Model 2 on *Potential for vote Switching* and TV (-0.010), Radio (0.008), Newspaper (0.007) for Model 5 on *Openness*.

campaign environment.[68] The magnitude of the coefficients for *Party Identification* is similar to that of those accounting for online newsgathering, especially in Models 2 and 5. Specifically, if an individual identifies with a political party his\her likelihood of being uncertain is shifted about 1 point down the scale for *Potential for vote switching.* Online *newsgathering* produces a similar shift in the opposite direction.

With regard to the role of *Political Attitudes and Opinions*, we find that former Fianna Fáil voters were more uncertain than the rest of the population, which is understandable given the context of the election. It is worth noting that the magnitude of this effect is much smaller than that associated with online newsgathering (in both Models 2 and 5). Interestingly, we find some evidence (though not across alternative dependent variable specifications) that those who feel that their vote matters, and that voting is a duty (rather than a choice) were more politically uncertain. We also find inconsistent evidence that those who place themselves at the centre of the left-right continuum are less electorally uncertain than those who did not know how to place themselves on the scale (reference category). We find no evidence that 'extremists' on the left-right scale are significantly different from those who did not place themselves.

Robustness Checks

Geography

Balancing areas with and without broadband coverage is key to correctly identifying

[68] Michael Marsh, 'None of that post-modern stuff around here: Grassroots Campaigning in the 2002 Irish General Election', *British Elections & Parties Review*, 14 (2004), 245–67.

the effect of the Internet on voter uncertainty. As such, we implement two types of additional analysis designed to sharpen our identification strategy, and provide greater certainty of the validity of our core finding.

First, although areas with broadband coverage and areas without proved to have similar features in terms of possible confounding factors, some minor imbalances still remain in a few variables, i.e. education, left-right placement (extremists), and party identification. To further balance the two types of constituency, we seek help from geography. A sceptical reader might argue that a 'capital city divide' drives our results, as the entire Dublin area has broadband coverage and Internet use is more frequent among Dubliners than non-Dubliners in our sample. To rule out this possibility, we introduce a variable 'Distance', which measures in miles how far a respondent's location is from Dublin city centre.[69] If distance from Dublin is correlated with both our dependent variable and with browsing for news online, then the variable 'Distance' should account for this causal channel. As such, if our results maintain their significance despite the inclusion of 'Distance' (in models 7 and 8), we can be confident that a 'Dublin divide' is not the underlying factor driving our results.

Second, we implement a matching technique to further balance constituencies with and without broadband (models 9 and 10). Specifically, we match our instrument on distance from the closest unit (either a village or a neighbourhood) in the other group, as socio-economic characteristics are usually geographically clustered. Moreover, we match *Broadband Coverage* on the three covariates that are slightly unbalanced: education, extremisms, and party identification.

This test is both important and quite conservative. It is important, because if these pre-treatment variables, which are unbalanced, affect the dependent variables, our

[69] Results are similar if we use the natural logarithm of the variable Distance.

instrumental variable estimation does not address the issue of confounding factors. Put simply, the effect of the Internet on electoral certainty could occur via these slightly unbalanced variables, which happen to be correlated with both the treatment and the instrument. It is conservative, because by reducing our sample we increase the error around our estimates.

We make use of the STATA 11 module of the Coarsened Exact Matching Software.[70] By adopting this approach, the L_1 overall balance measure (which captures the imbalance for the full joint distribution) drops from 0.47 to 0.03, reducing by 94% the imbalance of the full joint distribution. The sample size suffers a reduction of 57 observations among those without broadband coverage and 237 among those with broadband coverage.[71] Table 5 below reports estimate results for both dependent variables controlling for distance in the full sample (models 7 and 8) and in the matched one (models 9 and 10).

Table 5. Distance from Dublin and matching. *Internet* instrumented using *Broadband Coverage*. The reference category for Left/Right placement (L/R) is those who did not place themselves (Don't know). Robust C.I. in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[70] Matthew Blackwell., Stefano Iacus, Gary King, and Giuseppe Porro, 'Coarsened Exact Matching in Stata' *Stata Journal* 9 (2009), 524–46; Stefano Iacus, Gary King and Giuseppe Porro 'Causal Inference Without Balance Checking: Coarsened Exact Matching', *Political Analysis*, 20 (2012), 1 – 24.

[71] We do not choose the coarsening of the variables *Distance and Education* at any specific values. If we choose the coarsening of *Distance* and *Education* at its mean or its median as is customary, we obtain similar results. However, in these cases we do not lose any observations and the L_1 overall balance measure is higher than the one obtained without coarsening at any specific values. We note that the dropped observations are the unbalanced ones.

	Potential for vote switching	*Openness*	*Potential for vote switching*	*Openness*
	(7)	(8)	(9)	(10)
Internet	**1.23*** **	**0.04*** **	**1.02** **	**0.04*** **
	(0.32 - 2.14)	**(0.01 - 0.06)**	**(0.06 - 1.97)**	**(0.01 - 0.05)**
Socio-Economic Status				
Gender	-0.03	-0.00	-0.02	-0.00
	(-0.27 - 0.21)	(-0.01 - 0.00)	(-0.24 - 0.28)	(-0.01 - 0.01)
Education	0.12**	0.00***	0.19***	0.01***
	(0.00 - 0.24)	(0.00 - 0.01)	(0.05 - 0.32)	(0.00 - 0.01)
Age	-0.02***	-0.00***	-0.02***	-0.00***
	(-0.03 - -0.01)	(-0.00 - -0.00)	(-0.03 - -0.01)	(-0.00 - -0.00)
Class	-0.04	-0.00	-0.01	-0.00
	(-0.13 - 0.05)	(-0.00 - 0.00)	(-0.47 - 0.56)	(-0.00 - 0.00)
Political Involvement				
TV	-0.01	0.00	0.01	0.00
	(-0.09 - 0.08)	(-0.00 - 0.00)	(-0.08 - 0.10)	(-0.00 - 0.00)
Newspaper	0.06**	0.00***	0.05*	0.00**
	(0.01 - 0.11)	(0.00 - 0.00)	(-0.01 - 0.11)	(0.00 - 0.00)
Radio	-0.01	-0.00	-0.00	-0.00
	(-0.08 - 0.06)	(-0.00 - 0.00)	(-0.08 - 0.08)	(-0.00 - 0.00)
Party Identification	-0.80***	-0.01***	-1.02***	-0.01**
	(-1.09 - -0.51)	(-0.02 - -0.01)	(-1.47 - -0.56)	(-0.03 - -0.00)
Interest in Politics	-0.10	-0.01**	0.02	-0.00
	(-0.27 - 0.07)	(-0.01 - -0.00)	(-0.18 - 0.22)	(-0.01 - 0.00)
Candidate Visit	0.01	-0.00	0.00	-0.00
	(-0.20 - 0.22)	(-0.01 - 0.00)	(-0.22 - 0.23)	(-0.01 - 0.00)
Political Attitudes and Opinions				
Vote Matters	0.01	0.00***	0.04	0.00***
	(-0.06 - 0.08)	(0.00 - 0.01)	(-0.04 - 0.12)	(0.00 - 0.01)
L/R (Centre)	0.32	0.01**	0.38	0.02***
	(-0.08 - 0.73)	(0.00 - 0.02)	(-0.09 - 0.85)	(0.01 - 0.03)
L/R (Extremes)	0.11	0.00	0.17	0.01
	(-0.34 - 0.56)	(-0.01 - 0.01)	(-0.37 - 0.70)	(-0.01 - 0.02)
Duty vs Choice	0.26*	0.00	0.39***	0.00
	(-0.02 - 0.54)	(-0.00 - 0.01)	(-0.11 - 0.67)	(-0.00 - 0.01)
Previous Fianna Fáil	0.31**	0.01***	0.33**	0.01***
	(0.06 - 0.55)	(0.00 - 0.02)	(0.06 - 0.61)	(0.00 - 0.01)
Distance from Dublin	-0.00***	0.00		
	(-0.01 - -0.00)	(-0.00 - 0.00)		
Minimum distance from closest non-broadband area			-0.00	0.00
			(-0.01 - -0.00)	(-0.00 - 0.00)
Broadband coverage (first stage)	0.89***	0.89***	0.82***	0.82***
	(0.65 - 1.13)	(0.65 - 1.13)	(0.56 - 1.08)	(0.57 - 1.08)
Constant	-2.07***	0.77***	-3.12***	0.76***
	(-3.27 - -0.88)	(0.74 - 0.80)	(-4.51 - -1.74)	(0.72 - 0.79)
Matching	no	no	Yes	yes
Observations	1,321	1,321	1,098	1,098

The outputs of the analysis on matched observations do not change significantly; for both dependent variables we obtain estimates that are very consistent with those reported in Table 4. Thus, our findings are robust to both the control for geographical characteristics and the control for imbalance between treatment and control groups. The confidence intervals, especially in models 7 and 9, remain wide and coefficients do not change substantially from the baseline model in Table 4.

Twitter

Finally, we examine whether our findings are robust to the specification of an alternative instrumental variable to capture the effects of online newsgathering. Our analyses have thus far examined the effects of browsing online for politically relevant news, understood in a broad sense. Due to the multifaceted nature of the Internet as a medium, we are unable to map the specific sites visited and content encountered by our respondents. Here, we both check the robustness of our main finding and examine the effects of visiting a specific platform: Twitter.com.

Twitter.com is a highly popular micro-blogging platform: it allows each user to post information (which must be parcelled into textual packets of no more than 140 characters) to be viewed by all users who 'follow' their accounts. Such information includes text, hyperlinks to other websites, and video and audio files. Users can also 'retweet' (i.e. copy and forward) other user's posts to their followers. Thus, Twitter.com maximizes the fragmentation of news sources that we discuss in explaining the rationale behind H_2. The likelihood that users will be exposed to information that runs contrary to their prior preferences (thus leaving them more politically uncertain) is maximized in the Twitter.com environment, where every user of the site is potentially a content creator. On the other hand, each user decides

whom to follow, and thus may choose to build their own ‘filter bubble’ by following only those other users who they know are consonant with their prior preferences. If this use pattern is highly pervasive, then using Twitter.com may serve to reinforce voters’ pre-existing electoral preferences.

Table 6. Potential for vote switching and Openness. TREATREG: *Twitter* instrumented using *Broadband Coverage*. The reference category for Left/Right placement (L/R) is those who did not place themselves (Don't know). Robust C.I. in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Potential for vote switching	*Openness*
	(11)	(12)
Twitter	**1.24****	**0.05*****
	(0.19 - 2.29)	**(0.02 - 0.07)**
Socio-economic status		
Gender	-0.03	-0.00
	(-0.27 - 0.22)	(-0.01 - 0.00)
Education	0.14**	0.00***
	(0.02 - 0.26)	(0.00 - 0.01)
Age	-0.02***	-0.00***
	(-0.03 - -0.01)	(-0.00 - -0.00)
Class	-0.05	-0.00
	(-0.14 - 0.04)	(-0.00 - 0.00)
Political involvement		
TV	0.00	0.00
	(-0.08 - 0.09)	(-0.00 - 0.00)
Newspaper	0.07**	0.00**
	(0.01 - 0.12)	(0.00 - 0.00)
Radio	-0.01	-0.00
	(-0.08 - 0.06)	(-0.00 - 0.00)
Party Identification	-0.86***	-0.01***
	(-1.15 - -0.57)	(-0.02 - -0.01)
Interest in Politics	-0.05	-0.00**
	(-0.22 - 0.11)	(-0.01 - -0.00)
Candidate Visit	0.04	-0.00
	(-0.17 - 0.25)	(-0.01 - 0.00)
Political attitudes and opinions		
Vote Matters	0.02	0.00***
	(-0.05 - 0.09)	(0.00 - 0.01)
L/R (Centre)	0.30	0.01**
	(-0.11 - 0.71)	(0.00 - 0.02)
L/R (Extremes)	0.01	0.00
	(-0.44 - 0.46)	(-0.01 - 0.01)
Duty vs Choice	0.22	0.00
	(-0.06 - 0.50)	(-0.00 - 0.01)
Previous Fianna Fail	0.26**	0.01***
	(0.01 - 0.50)	(0.00 - 0.02)
Broadband coverage (first stage)	0.70***	0.70***
	(0.41 - 0.98)	(0.41 - 0.98)
Constant	-2.38***	0.77***
	(-3.56 - -1.20)	(0.74 - 0.80)
Observations	1,321	1,321

As we can see from Table 6, the results are nearly identical to those in Table 4. The use of Twitter as a source of political news appears to leave Irish voters more electorally uncertain – with the finding being statistically significant at the 95% and 99% levels in Table 6. Similarly to what we observed in models 2 and 5, using Twitter is about five times stronger in determining voters' uncertainty than having been a Fianna Fáil voter in the past.

Further robustness checks are reported in the Appendix to this article. The finding of a positive causal association between Internet newsgathering and political uncertainty remains unchallenged across all checks.

Conclusions

Our goal in this article has been to identify the causal impact of online newsgathering on voters' electoral uncertainty. A causal understanding of the effects of the Internet is generally very difficult to achieve due to selection into treatment, which represents a well-known challenge for any analysis of the impact of media on public opinion. We have focused on the question of whether using the Internet to gather political information in the context of a general election affects voters' certainty with regard to their vote choice. We have done this by implementing a quasi-experimental analytical approach built on variation in broadband availability in the Republic of Ireland. These analyses were made possible by the design of the 2011 INES, specifically the gathering of geo-location data on respondents, which allowed us to match individual respondent data to information about the availability of broadband in the area where they are resident. Several other election studies also collect geo-location data, and broadband availability varies regionally in many states other than Ireland – the analytical approach presented in this article thus offers a

methodological contribution to the study of the effects of Internet use by voters during election campaigns and should be applied to further studies.

This research speaks to a wider debate about the political and social impact of the emergence of the Internet. Some argue that the web is a space where users can pre-define the content that they receive in a manner that leads them to only receive information that is in line with their pre-existing preferences. The political implications of this argument are profound: Internet use may serve to re-enforce individuals' existing partisan and ideological predispositions and to polarize groups with differing opinions. Others counter that the diversity of online news, and the ease with which multiple websites can be accessed via hyperlinks when browsing the web, make it a media platform where users will encounter information and political perspectives that challenge their pre-existing perspectives, and perhaps make them more open to understanding alternative political positions. A range of robustness checks have validated our core finding, namely that using the Internet as a news source led to greater electoral uncertainty among Irish citizens in the 2011 election campaign.

At this point we cannot rule out the contention that national and contextual factors may condition the relationship between online newsgathering and electoral uncertainty – further research across a wider range of elections will be required to understand the conditionality of Internet effects on voters' electoral preferences. Ireland's 2011 election was exceptional in many respects – most notably the unfortunate economic situation, but also in terms of the lack of ideological competition among the main Irish parties. It is plausible that in a more ideologically polarized political environment, use of the Internet as a news source may lead to greater certainty among voters.

Furthermore, the mechanism(s) underlying the effects identified of the Internet on levels of political uncertainty require further research. It is extremely difficult to capture and classify the political content that is 1) available and 2) consumed online during political campaigns (or at any other time for that matter); this problem is exacerbated by the fact that the Internet itself is something of a 'shifting target' for analysts, a forum characterized by constant evolution in terms of the types of use that it facilitates. The next steps forward for research on this topic should provide more focus on differences in individual patterns of web use when newsgathering, and seek to develop methodological and analytical techniques that facilitate the identification of national-level, election-level and individual-level variables that condition the overall Internet effect identified here. Laboratory experiments, administering and controlling the type of online content browsed by individuals, may be an important tool for disentangling the aggregate phenomenon observed in our analysis.

However, in terms of overall effect – it is clear from this analysis that Ireland's wired voters are less electorally certain than their unwired counterparts, and this difference appears to be attributable to the influence of consuming political news online.

Our study has important implications for scholars of media and elections and for political actors. By empirically assessing the role of the Internet on voters' uncertainty, we have shown that the media in fact influences voters and that online newsgathering gives them more information to base their decisions on. Importantly, we find that the magnitude of the effect of the Internet on the outcome variables is large compared to other determinants of vote switching. Thus, every study on voters' uncertainty that neglects to take into account the role of the Internet suffers from a serious omitted variable problem. Also, parties and candidates need to consider their online profile and the type of information one might encounter online, as this information is one of the determining factors of voters' evaluations.