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

Introduction

The study of electoral uncertainty is one of the mainstays of the literature on voting behaviour. Early research on this topic pointed to high levels of voter loyalty: in the USA, the path-breaking 'Michigan' and 'Columbia' studies[2] uncovered considerable stability in individuals' voting preferences, with Campbell et al.[3] 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'. Similarly, the 'frozen'[4] party-system scenario of Western Europe in the late 1960s 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 their electorates.

[2] For a discussion of these studies see: Bartels 2010.

[3] Campbell et al. 1967, 151.

[4] Lipset and Rokkan 1967.

However, over the last three decades, increased levels of electoral uncertainty have been observed in multiple studies, covering established democracies around the world. Indeed, Putnam et al. note that 'seldom does such a diverse group of nations reveal so consistent a trend'.[5] The most closely-studied gauge of electoral uncertainty is the declining number of self-reported partisan identifiers in various national-level surveys.[6] Other indicators include: growth in levels of aggregate electoral volatility;[7] growth in the proportion of individuals who indicate that they are highly likely to vote for more than one party when surveyed,[8] or who (given the opportunity) engage in 'split ticket voting';[9] an erosion of party membership numbers;[10] increases in the numbers of electoral late deciders;[11] and decreases in the predictive power of socio-economic characteristics and ideological self-placement for individual-level models of vote choice.[12]

The media environment has consistently featured among those factors that have been discussed as possible causes of growing levels of electoral uncertainty. For instance, Dalton[13] argues that a growth in the availability of news from independent broadcast media along with an array of societal changes provide modern voters with both more politically diverse information and greater cognitive capacity to process this

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[5] Putnam, Pharr and Dalton 2000.

[6] Berglund et al. 2005; Clarke and Stewart 1998; Dalton 2012; Dalton 2007; Dalton 2000.

[7] Mair 2005, 12-14.

[8] Kroh, van der Brug and van der Eijk 2007.

[9] Dalton, MacAllister and Wattenburg 2000.

[10] Mair and van Biezen 2001; Katz and Mair 1992.

[11] McAllister 2002.

[12] van der Brug 2010; Franklin, Mackie and Valen 1992.

[13] Dalton 2000.

information than their forbearers enjoyed. Similarly, Kroh et al.[14] 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.

However, extant research focuses exclusively on the effects of the 'traditional' or 'mass' media that are characteristic of the 'modern' political communications environment: newspapers, radio and television.[15] Although many commentators have speculated on the potentially transformative impact of the Internet on the conduct of politics in contemporary democracies – adopting both optimistic[16] and pessimistic[17] perspectives, the effects of the arrival of the Internet on voter uncertainty have not been systematically studied to date.

Because the hyperlinking of news content on the Internet allows readers to access multiple sources and to easily jump from one website to another; use of the Internet as a news source both enlarges the overall volume of available political information and increases the diversity of sources from which citizens can gather such information. These features of the online news environment have potentially profound impacts for voters' level of political uncertainty. 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, one of Europe's most volatile post-war elections. Along with a volatile electorate, Ireland

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[14] Kroh, van der Brug and van der Eijk 2007.

[15] Norris 2000.

[16] Howe and Strauss 2000; Shirky 2010.

[17] Morozov 2010.

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,[18] which can also explain voter uncertainty. This fact of life creates the epistemological problem of causal endogeneity in assessing the Internet's effects on its users. However, media choice is also 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. Ireland's quasi-random variation in broadband availability allows us to tackle what Mondak[19] 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 across the Irish territory provides such a contrast or control group, comprised of those citizens who are not exposed to the variable of interest (i.e., high-speed Internet). We exploit this fact to develop an availability-based natural experiment employing an instrumental variables modelling

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[18] Norris 2001; Papacharissi and Rubin 2000.

[19] Mondak 1995.

approach that allows us to treat online newsgathering as an independent variable, and political uncertainty as a dependent variable in our analysis. A number of recent studies have highlighted the causal effect of the media environment on vote choice and turnout, with several using similar methodological innovations to those developed in this paper.[20]

The take-away message of our study is that browsing the Internet for political news during the 2011 Irish general election campaign led to higher levels of political uncertainty among voters. Our results hold for two operationalizations of voter uncertainty and for several different model specifications, as well as standing up to a wide range of robustness checks.

In the next section, we provide some context on the Irish case, before outlining our theoretical expectations and empirical hypotheses regarding the relationship between online newsgathering and electoral uncertainty. A review of extant research and debate on the effects online newsgathering leads us to conclude that there are competing lines of argumentation and divergent expectations regarding the effects of the Internet on electoral uncertainty, and we therefore adopt an agnostic approach in formulating our research hypotheses. 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 findings. We conclude with a discussion of implications of our findings and their generalisability beyond the Irish context.

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[20] Della Vigna and Kaplan 2007; Della Vigna et al. 2011; Enikolopov, Petrova, and Zhuravskaya 2011; Gentzkow 2006; Gentzkow, Shapiro, and Sinkinson 2011; Kern and Hainmueller 2009; Ladd and Lenz 2009.

The 2011 Irish Election

The data gathered for this study pertain to the 2011 Irish election. Our reasons for selecting the Irish case were twofold. First, we were able to avail of data combining information on broadband availability with responses to a national election study. This combined dataset facilitates the causal modelling of Internet effects (as detailed in the 'Research Design' section). Our second reason for focusing on the Irish case is that the topic of electoral uncertainty is substantively important in the contemporary Irish context: 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.[21]

During the build-up to the election, the Irish government encountered an unprecedented conflagration of banking, fiscal and employment crises, which culminated in an Irish 'bailout' agreement, and the imposition of strict funding conditionality by the European Union (EU), the European Central Bank (ECB), and the International Monetary Fund (IMF). The government parties (Fianna Fáil and the Green Party) were both heavily punished by the Irish electorate 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.

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[21] Gallagher 2011; Mair 2011.

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 Alliance	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.

However, long before the results that led 2011 to be described as Ireland's 'earthquake election',[22] Marsh had made the argument that 'a majority of (Irish) voters appear to be open to persuasion according to the balance of short-term forces',[23] and one comparative study[24] ranked Ireland's population among the most politically uncertain of the 15 pre-2004 European Union member states. When we apply that study's binary measure of potential vote switching[25] to previous waves of

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[22]Gallagher 2011.

[23] Marsh 2006, 491.

[24] Kroh, van der Brug and van der Eijk 2007.

[25] Specifically, Kroh, van der Brug and van der Eijk define likely switchers as those respondents who either have two or more parties tied for their highest probability score, or whose second-ranked preference is only one point less than their first. 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.

the INES, we find that likely switchers in the Irish population remained stable at the comparatively high level of 50% across the three election-year of the Irish National Election Studies (2002; 2007; 2011). Thus, 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, and it appears that the circumstances of the 2011 campaign activated this potential.

The Irish party system is characterized by a number of idiosyncratic traits, most notably the ideological similarity of the two historically-dominant parties (Fianna Fáil and Fine Gael)[26] and the comparative electoral weakness of the Irish Labour Party,[27] as well as the absence of a radical right party.[28] As we discuss in our conclusions, such national-level contextual factors may condition the effects of the Internet on levels of political uncertainty; the lack of ideological and partisan polarisation in the Irish party system and electorate may militate against the partisan filtering of news that underlies theoretical accounts linking use of the Internet to a decline in electoral uncertainty.

Finally, and importantly for the research presented here, the 2011 election campaign was also marked by a substantial increase in use of the Internet by Irish candidates, parties, media, and voters, relative to the previous election in 2007,[29] meaning that the Internet was a politically-relevant medium.

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[26] Benoit and Laver 2003; Sudulich and Wall 2010.

[27] Weeks 2009.

[28] O'Malley 2008.

[29] Wall and Sudulich 2011.

The Internet and Political Uncertainty: Theory and Hypotheses

Although, as described in our introduction, a marked increase in electoral uncertainty has been noted in recent decades in established democracies across the globe, relatively little is currently known about the factors that either foster or inhibit political uncertainty at the individual level.[30] Some of the classic U.S. voting behaviour literature does touch upon this subject, concluding that uncertain voters are comparatively uninformed about politics.[31] Zaller[32] refines this position, arguing that individuals with moderate levels of political information and knowledge are in fact the most open to influence. From a European perspective, however, both Daudt[33] and van der Eijk and Niemöller[34] 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[35] suggests that political attentiveness may in fact be negatively related to uncertainty, though this finding is not consistent across all models.

The 'cognitive mobilisation' hypothesis first proposed by Dalton[36] theorised that the availability of more abundant political information (along with an increased capacity to process such information among the electorate) would erode the importance of

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[30] Mayer 2008.

[31] Campbell et al. 1967; Converse 1962; Trenaman and McQuail 1961.

[32] Zaller 1992.

[33] Daudt 1961.

[34] van der Eijk and Niemoller 1983.

[35] Kroh, van der Brug and van der Eijk 2007.

[36] Dalton 1984.

partisan 'rules of thumb' to voters. However, the direction of the relationship between increased levels of political information and electoral uncertainty remains unclear. While the cognitive mobilization hypothesis has received some confirmatory support, [37] Albright [38] presents evidence indicating that increased cognitive mobilisation leads to higher levels of partisan attachment. More recently, Dalton[39] has developed a theoretical framework that incorporates causal flows in both positive and negative directions between cognitive mobilisation and partisan attachment.

Clearly then, information is an important, if somewhat unpredictable, determinant of electoral uncertainty. However, the communication of information requires a medium and each type of medium has its own distinctive technological advantages and limitations, which dictate the type of information that is imparted. To borrow McLuhan's evocative phraseology – the medium is the message.[40]

A substantial 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 such as turnout,[41] efficacy[42] and vote choice.[43] Both Dalton[44] and Kroh et al.[45] point to a

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[37] Dalton 2007; Inglehart 1990; Pharr and Putnam 2000.

[38] Albright 2009.

[39] Dalton 2012.

[40] McLuhan 1964.

[41] Aarts and Semetko 2003.

[42] Banducci and Karp 2003.

[43] Della Vigna and Kaplan 2007; Della Vigna et al. 2011; Enikolopov, Petrova, and Zhuravskaya 2011; Ladd and Lenz 2009.

[44] Dalton 2000.

[45] Kroh, van der Brug and van der Eijk 2007.

link between traditional 'mass' media and electoral uncertainty, while other studies have established a causal relationship between public opinion on a range of topics and exposure to traditional media.[46] However, although it is widely acknowledged that the advent of the Internet, and particularly its contemporary 'Web 2.0' incarnation,[47] has dramatically altered the modern voter's media environment, the consequences of online newsgathering for voting behaviour remain empirically under-examined.[48]

Experimental investigations and analyses of online user-generated content[49] have attempted to disentangle how political experiences take shape online and how individuals react to dissonant opinions they encounter via the Internet. However, convincing analysis of the effects of online experiences on electoral behaviour based on observational data is still very scarce. Research seeking to link online newsgathering to electoral behaviour has instead focused on the Internet's effects on political participation.[50] While Gibson and McAllister's study[51] of the Australian 2004 general election concludes that 'online election news seekers are more independently minded than other voters', such studies do not deal with the issue of causal endogeneity in examining the effects of online newsgathering that we outlined in our introduction.

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[46] Brandenburg and van Egmond 2012; Hayes and Guardino 2012; Kern and Hainmueller 2009; Ladd and Lenz 2009.

[47] Anderson 2007.

[48] Tewksbury and Rittenberg 2012.

[49] Garrett and Resnick 2011; Garrett 2009; Munson and Resnick 2010; Conover et al. 2011.

[50] Boulianne 2009.

[51] Gibson and McAllister 2006, 256.

Therefore, the research presented here contributes to the literature by connecting online newsgathering with observational data on political uncertainty, using a research design that addresses the issue of causal endogeneity in assessing media effects.

Two schools of thought have characterized the broader debate on the effect that the Internet may have on voters, and we use the arguments and research proposed by each to develop two alternative empirical hypotheses to guide our study.

The first school of thought on the Internet and its political effects comprises several scholars[52] who have argued that the Internet is a medium that facilitates *selective exposure* to content, leading users to reinforce their pre-existent beliefs. They contend that the pull-in nature of the Internet leads individuals to explore the web by searching among information sources and *loci* that are in-line with their prior preferences. Rather than an open market square, this view depicts the Internet as a collection of private members' clubs, where the likelihood of bumping into outsiders is practically nil. Furthermore, Pariser[53] alleges 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. In terms of empirical analysis, Nie et. al[54] find that consumers of online news tend to hold more extreme political views than non-consumers, in line with their preferences for (either left or right of centre) cable television news. They attribute this finding to a

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[52] Bimber and Davis 2003; Mutz and Martin 2001; Sunstein 2001; Sunstein 2012; Trenaman and McQuail 1961.

[53] Pariser 2011.

[54] Nie et al. 2010.

combination of the selective filtering described above and the representation of more extreme political opinions on the Internet than are available in offline media (due to the dramatically lowered costs of production for online news).

Generally, this view would lead us to expect that Internet exposure/use does not entail encountering information that may challenge voters' prior political preferences. Empirically, we test this contention by specifying the following hypothesis:

> **H₁**: 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 H₁ are a number of studies[55] which indicate that use of the Internet can challenge traditional social boundaries by exposing users to alternative opinions, views and sources. This approach focuses on an alternative defining characteristic of the Internet, its hypertextuality, which may drive users to unanticipated *loci,* producing an unintentional or 'by-product' learning effect and exposing users to content they would have not encountered otherwise.[56] Tweksbury and Rittenburg[57] characterize the findings of several 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'. For instance, Garret et al.[58] found that Americans' use of attitude-

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[55] Norris 2000; Norris 2001; Putnam 2000; Shirky 2010.

[56] Chadwick 2012.

[57] Tewksbury and Rittenberg 2012.

[58] Garrett, Carnahan and Lynch 2011.

consistent online sources positively correlates with consumption of attitudinally challenging sources, and Garret[59] found that individuals spend longer read times on attitude-discrepant online items, suggesting that Internet users gather awareness of dissonant positions. Gentzkow and Shapiro indicate that web users frequently browse sites that feature content that runs contrary to their ideological leanings, leading them to conclude that 'the Internet is far from segregated'.[60] Finally, Valentino et al., by means of a lab experiment, demonstrate that is not uncommon for citizens to seek out information that challenges their attitudes and opinions while online.[61]

These considerations would lead us to anticipate that voters are exposed to attitude-challenging information on the Internet. 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*.

We test these two mutually exclusive hypotheses by assessing whether using the Internet as a news source affects voters' level of electoral uncertainty. Moreover, we are able to assess whether the role of the popular micro-blogging platform Twitter triggers similar effects on voters' uncertainty. Due to the multifaceted nature of the Internet as a medium, we are unable to map the specific sites visited and the content encountered by our respondents. However, participants were asked about whether they had used Twitter.com in the run up to the election. The inclusion of Twtter.com

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[59] Garrett 2009.

[60] Gentzkow, and Shapiro 2011, 1801.

[61] Valentino et al. 2009.

in our analysis is particularly important because it sheds some light on whether social networking sites significantly differ from other websites in their effects on 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.[62] The ideal scenario from a methodological standpoint would be a random assignment of the possibility of browsing the Internet for political news to individuals. Given random assignment, we could simply compare the treatment and control groups.[63] The difference between the average level 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, 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

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[62] Imai et al. 2011.

[63] Imai, Tingley. and Yamamoto 2013; Rubin 1974.

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 varies according to location within 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. Moreover, we include in both stages of 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.[64] In order to perform our analysis, we 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

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

broadband coverage in each respondent's geographical location. [65] 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.[66] 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.

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[65] We firstly searched for broadband coverage in each location by consulting information on broadband availability supplied by major providers and, additionally, by using two online services that provide detailed information on broadband coverage by location (getbroadband.ie and bonkers.ie). These websites were accessed by the authors between October 2011 and December 2011. The INES survey was run between January and March 2011.

[66] For all those locations whose name was present in more than one county we used 'location+broadband+constituency'.

Figure 1. Geographical distribution of Broadband Coverage.

Dependent variables

The dependent variable in this study is the level of electoral uncertainty of an individual voter. As this study takes place in a multiparty system, the operationalization of electoral uncertainty is complex, and in this section we 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 widely-used

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 '0' means 'NOT AT ALL PROBABLE' and '10' means 'VERY PROBABLE.*

Our first measure of the electoral uncertainty was originally developed by Kroh et al.;[67] we label it *Potential for Switching*. 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 inverse and/or normalized versions of the index) has already been used extensively in political science analyses. For instance, the index has been adapted to measure the extent of societal fragmentation of states[68] and to calculate the well-known 'effective number of parties' measure of vote and seat fragmentation.[69] We compute *Openness* using a normalized version of the Herfindahl-Hirschman index as follows:

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[67] Kroh, van der Brug and van der Eijk 2007.

[68] For a detailed discussion, see: Alesina et al. 2003.

[69] Laakso and Taagepera 1979.

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

where (x_i) is the PTV of each party, divided by the total of all the probabilities filled in by respondents. 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 uncertainty. 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 *Openness* score of 0. The more closely the HH value approaches 1, the greater the extent to which the respondent is divided between multiple parties. Thus, for both of these 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 the Internet for news at least once per week and '0' for respondents who never go online for news. The set of respondents who receive online news is defined as the treatment group, whereas the set of respondents who do not go online is defined as the control group.[70] 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.*

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[70] Rosenbaum 2002; Rubin 1974.

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 would further complicate the identification strategy. [71] Indeed, our instrument captures only whether or not respondents have access to the Internet, but does not explain their frequency of going online. In our dataset, 384 respondents report that they go online to gather political news.

Control Variables

To reduce the danger of confounding factors driving our results, we include a large number of control variables in our analysis. In specifying our models, we follow Kroh et al. [72] in terms of the variables that we seek to control for, as well as including a number of additional independent variables that are particularly crucial to our research design. 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;* as well as a measure of the distance of the respondent's location from the nearest Irish city.

Socio-Economic Status characteristics include age; gender; education; and social class. In terms of *Political Involvement*, we include variables accounting for individuals' party identification; consumption of television news and newspapers; and a general measure of political attentiveness.

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[71] Imbens and Wooldridge 2009; Kern and Hainmueller 2009.

[72] Kroh, van der Brug and van der Eijk 2007.

We also include variables accounting for the fragmentation of respondents' newspaper consumption (a dichotomous variable that separates those who regularly read three or more newspapers from those who do not) and whether or not respondents had discussed the election with family, friends and acquaintances. These latter two variables represent an important element in our design because they allow us to address the argument that the observed effect of online newsgathering on electoral uncertainty may be due to generally higher levels of news consumption and political discussion among those who gather news online. Traditional media play an important role during Irish election campaigns,[73] and one might argue that people who browse online news are also more likely to read several newspapers, watch multiple TV programs and engage in many discussions about elections. McMenamin et al.[74] point out that the fragmentation of electoral frames in the Irish media was particularly pronounced during the 2011 electoral campaign. Thus, it might be the case that such a variety of frames in offline media impacts voters' uncertainty. If going online for political information is correlated with discussing elections offline and/or reading several newspapers, [75] the effect of *Internet* on our dependent variables may be spurious – hence it is important to account for these variables as controls in our models.

 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 those who considering voting

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[73] Leahy 2011.

[74] McMenamin et al. 2013.

[75] We note that controlling for how many days a respondent reads the newspaper would not account for such a mechanism. Indeed, the mechanism boils down to heterogeneity of sources rather than frequency of the use of traditional media.

as duty versus as a choice; and a variable that scores one if the respondent agrees with a statement claiming that voting matters (and zero otherwise). Finally, we include 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.

Because geography is key to our identification strategy, we measure how far each respondent's location is from the centre of the closest city.[76] The inclusion of this variable is particularly important in this study because, as we will discuss, broadband availability tends to be greater in urban areas – meaning that this factor must be carefully accounted for in our analysis.

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 the *Broadband Coverage* variable and a set of covariates.[77] We do so by implementing

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[76] Distance is measured in kilometres. Following Irish legislation, we consider Dublin, Cork, Galway, Limerick, and Waterford as Ireland's cities.

[77] Our research design thus incorporates a similar identification strategy to: Bhuller et al. 2011; Enikolopov, Petrova and Zhuravskaya 2011; Kern and Hainmueller 2009.

Two-Stage-Least-Squares (2SLS) estimations on the two dependent variables discussed above.[78]

According to Abadie[79], 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 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 with or without broadband should only impact on a respondents' electoral uncertainty by effecting 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 variable. 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 (Figure A3).

Figure 2 shows the balance between areas with broadband and areas without broadband are for ordinal control variables. The four ordinal variables are quite well-balanced, though *Education* and *Vote Matters* display a slightly different distribution

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[78] We employ IVREG2 estimates.

[79] Abadie 2003.

between the two groups. In the robustness check section, we will match on these two covariates to improve their balance.

Figure 3 describes the balance across broadband and no broadband areas over two continuous control variables: *Age* and *Distance from City*. While *Age* is well-balanced, the most significant disparity across the two groups is observable for the variable that we employ in order to capture the urban-rural divide: *Distance from City,* pointing to higher levels of broadband access in urban areas (Figure 3). [80] This result is hardly surprising and reinforces the validity of both *Distance from City* and *Broadband Coverage*. To account for this observed imbalance on the *Distance from City* variable, and to ensure that this imbalance is not driving our results, we both include it as a control variable in our main model and employ data matching techniques in a robustness check.

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

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[80] We show 'Age' and 'Distance from City' separately since they do not scale with the ordinal variables.
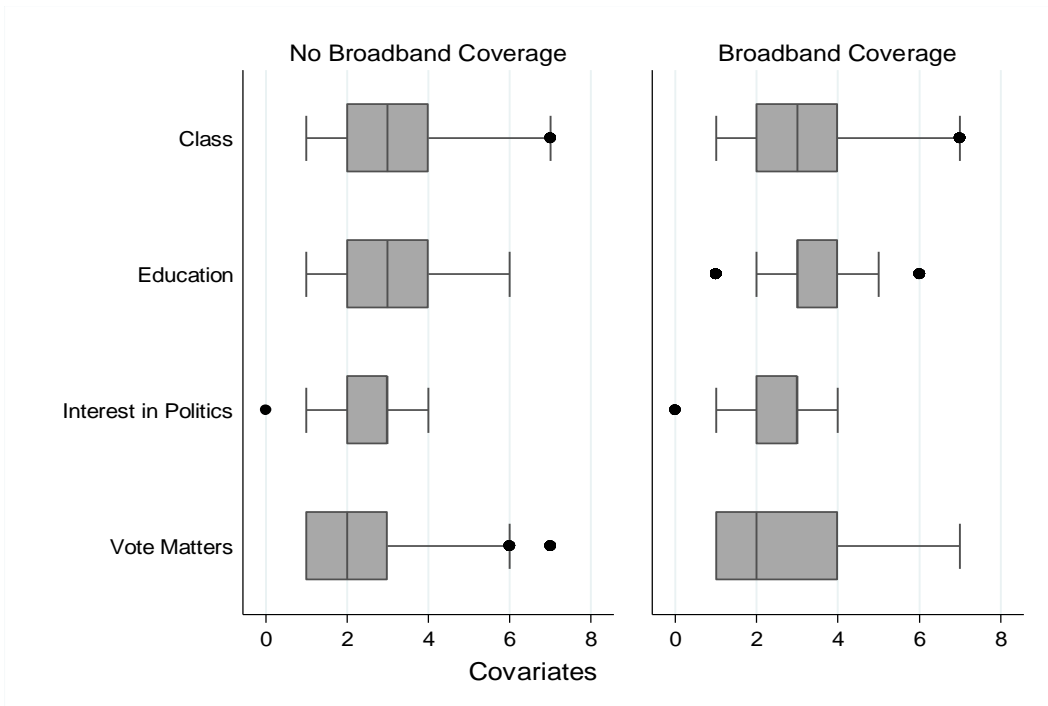
Figure 3. Box plots of the continuous covariate distributions in areas with and without broadband coverage.

No Broadband Coverage   Broadband Coverage

Age

Distance from City

Covariates
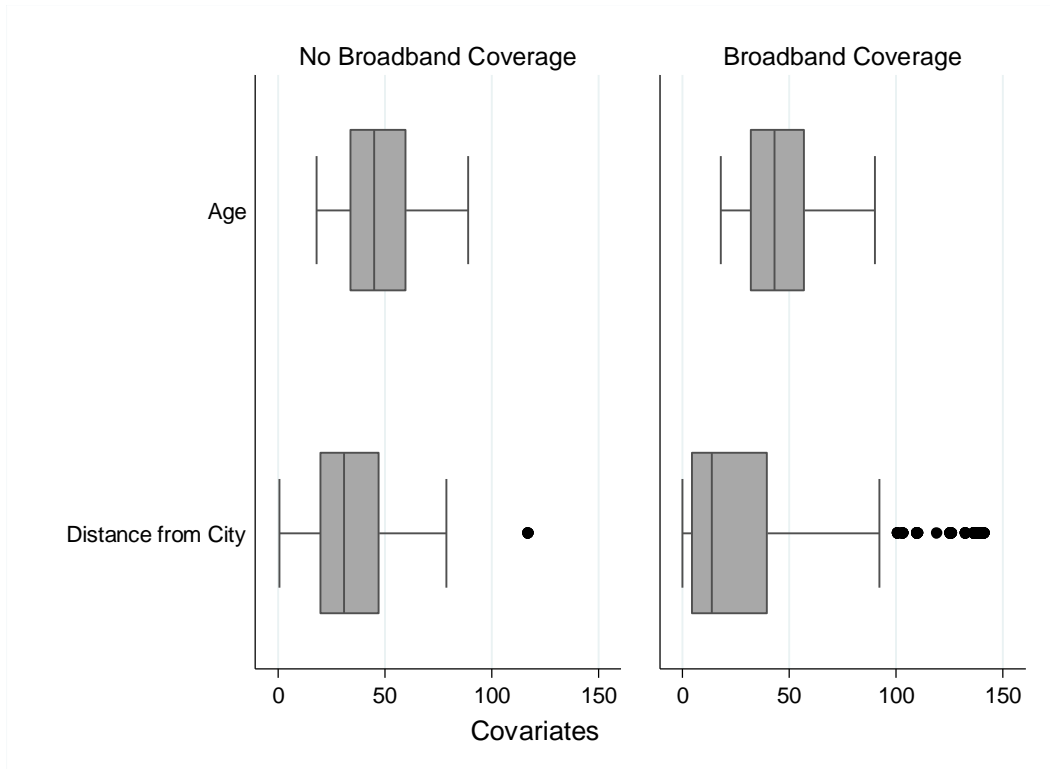
Regarding those control variables that are dichotomous, Table A2 in the Appendix shows the results of tests of proportions ('prtest' in STATA 12) across the broadband versus no broadband areas. The dummies with statistically significantly unequal proportions are Newspaper, Duty vs. Choice, L/R (center), L/R (extreme), and Party Identification. To improve the balance of these confounding factors we include all of them in the matching analysis implemented in the Robustness Checks section. Overall, although there are differences in the distribution of some covariates, areas with and without broadband coverage appear quite similar with respect to several key characteristics.

A further assumption requires that *Broadband Coverage* is a strong instrument for browsing for political news. In other words, *Broadband Coverage* must be highly correlated with Internet use, conditional on the set of control variables. There are reasons to suspect that this variable does not completely capture access to the Internet: some respondents browse political news when they are at work, or they may

use mobile phones, while others may have broadband access but little interest in current affairs.

Table 2 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), and that heavy use of the Internet as a political news source (i.e., more than two days a week) is completely absent among respondents in areas without broadband coverage. The correlation between the variables is 0.41. Moreover, when we regress *Broadband Coverage* on *Internet*, controlling for a large number of covariates, in the first stage of our estimations *Broadband Coverage* is statistically significant and the t-statistic is larger than 10 across all models.[81] We acknowledge that people in areas without broadband coverage may access the Internet at their workplace or via mobile devices – and Table 2 indicates that just under 10% of respondents in areas without broadband do use the Internet as a political news source.

However, as long as accessing the Internet from work and mobile Internet use is not systematically related to broadband access, our effects should still be identified. Indeed, if people in places with no broadband availability have other means of accessing the Internet, our effects should be underestimated.

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[81] As suggested by Angrist and Pischke 2012, 217-18, we employ some further commonly used tests with instrumental variables.

Table 2. Browsing political news and broadband coverage.

Browsing political news online (days per week)	Living 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 having access to broadband and browsing for political news. Given that broadband technology greatly facilitates Internet use generally, and the strongly positive relationship between *Broadband Coverage* and *Internet* observed in our data, we argue that our instrument meets this assumption.

Analysis

We begin by estimating baseline models (1 and 3) that include only the *Socio-Economic Status* control variables for both of our dependent variables. Then we add the other sets of control variables: *Political Involvement* in models 2 and 4, while, in our full models (3 and 6) *Political Attitudes and Opinions* and *Distance from City* are also controlled for. [82] Table 3 reports coefficients and confidence intervals for parameter estimates of *Broadband Coverage* in the first stage and all covariates in

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[82] We note here that, as we add covariates, we lose observations due to missing values.

the second stage of our models for our two measures of electoral uncertainty:

Potential for Switching and *Openness*.[83]

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[83] We note here that the number of observations for models employing *Openness* as the dependent variable is slightly lower than those models that employ *Potential for Switching*. This is because the calculation of *Openness* required values on all PTV items, where some values were missing, the cases were dropped, whereas *Potential for Switching* could be calculated for all cases where a PTV score was assigned to at least two parties – meaning that fewer cases were dropped.

Table 3. Instrumental variables (IVREG2) models of electoral uncertainty, *Internet* instrumented using *Broadband Coverage**.

	(1)	(2)	(3)	(4)	(5)	(6)
		Potential for vote switching			*Openness*	
Internet	**1.87***	**1.81***	**2.52***	**0.15***	**0.17***	**0.21***
	(0.33 - 3.41)	**(0.16 - 3.45)**	**(0.35 - 4.69)**	**(0.03 - 0.27)**	**(0.04 - 0.30)**	**(0.05 - 0.37)**
Socio-Economic Status						
Gender	-0.06	0.12	0.01	-0.02	-0.01	-0.01
	(-0.28 - 0.16)	(-0.10 - 0.34)	(-0.24 - 0.27)	(-0.03 - 0.00)	(-0.02 - 0.01)	(-0.03 - 0.01)
Education	0.06	0.10	0.05	0.01	0.01	0.01
	(-0.07 - 0.18)	(-0.02 - 0.22)	(-0.10 - 0.20)	(-0.00 - 0.02)	(-0.00 - 0.02)	(-0.00 - 0.02)
Age	-0.01	-0.00	-0.00	-0.00	-0.00	0.00
	(-0.02 - 0.00)	(-0.02 - 0.01)	(-0.02 - 0.01)	(-0.00 - 0.00)	(-0.00 - 0.00)	(-0.00 - 0.00)
Class	0.01	0.01	0.02	-0.00	0.00	0.00
	(-0.08 - 0.10)	(-0.08 - 0.11)	(-0.09 - 0.13)	(-0.01 - 0.01)	(-0.01 - 0.01)	(-0.01 - 0.01)
Political Involvement						
TV		-0.98**	-1.77**		-0.03	-0.09**
		(-1.60 - -0.37)	(-2.45 - -1.10)		(-0.09 - 0.02)	(-0.15 - -0.03)
Newspaper		0.42*	0.34		0.03	0.02
		(0.02 - 0.83)	(-0.18 - 0.85)		(-0.00 - 0.06)	(-0.02 - 0.06)
Fragmentation		-0.34	-0.22		-0.02	-0.02
		(-0.92 - 0.23)	(-0.88 - 0.44)		(-0.07 - 0.02)	(-0.07 - 0.04)
Radio		-0.25	-0.02		0.02	0.02
		(-0.64 - 0.13)	(-0.50 - 0.45)		(-0.02 - 0.05)	(-0.02 - 0.06)
Party Identification		-0.94**	-0.73**		-0.06**	-0.04*
		(-1.26 - -0.62)	(-1.07 - -0.38)		(-0.08 - -0.03)	(-0.07 - -0.01)
Interest in Politics		-0.17	-0.24		-0.02*	-0.02*
		(-0.35 - 0.02)	(-0.49 - 0.01)		(-0.03 - -0.00)	(-0.04 - -0.00)
Candidate Visit		0.01	-0.02		0.00	0.01

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	(1)	(2)	(3)	(4)	(5)	(6)
		(-0.21 - 0.24)	(-0.29 - 0.26)		(-0.01 - 0.02)	(-0.01 - 0.03)
Offline Network		0.24	0.44*		0.03*	0.03
		(-0.07 - 0.55)	(0.04 - 0.84)		(0.00 - 0.05)	(-0.00 - 0.06)
Political Attitudes and Opinions						
Vote Matters			-0.02			0.00
			(-0.10 - 0.06)			(-0.00 - 0.01)
L/R (Centre)			0.02			0.02
			(-0.47 - 0.51)			(-0.02 - 0.06)
L/R (Extremes)			-0.25			-0.00
			(-0.79 - 0.28)			(-0.04 - 0.04)
Duty vs. Choice			-0.33*			-0.01
			(-0.65 - -0.01)			(-0.04 - 0.01)
Previous Fianna Fáil			0.28*			0.02
			(0.01 - 0.55)			(-0.00 - 0.04)
Distance from City			-0.01**			-0.00
			(-0.01 - -0.00)			(-0.00 - 0.00)
Constant	-2.20**	-1.34**	-0.16	0.70**	0.70**	0.72**
	(-2.99 - -1.41)	(-2.31 - -0.36)	(-1.37 - 1.06)	(0.64 - 0.76)	(0.61 - 0.79)	(0.62 - 0.82)
Broadband Coverage (first stage)	0.16**	0.16**	0.14**	0.17**	0.16**	0.15**
	(0.13 - 0.19)	(0.13 - 0.19)	(0.11 - 0.18)	(0.14 - 0.20)	(0.13 - 0.19)	(0.11 - 0.19)
Observations	1,754	1,576	1,200	1,635	1,466	1,127
Cragg-Donald Wald F statistic	128.73	111.27	63.18	139.00	117.15	70.63

The positive sign and statistical significance (with 95% confidence) of the coefficient of the *Internet* variable is constant across all models reported in Table 3, which indicates that browsing the Internet for news has a discernible impact on electoral uncertainty, *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 than those who did not – a finding that supports H_2, and invalidates H_1.

These outputs also show that the *Internet* variable coefficient has a wide confidence interval, a typical feature of instrumental variables models,[84] meaning that the amount of extra uncertainty engendered by using the Internet for political news is difficult to specify precisely – and this caveat should inform our interpretation of coefficient size. The coefficient for online newsgathering (versus no use of the Internet for political news) shows that it corresponds to an increase of about two units 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 approximately 20% more 'open' to multiple parties, *ceteris paribus*. However, looking at these coefficients in relation to those of other variables[85] in the models is more meaningful. For instance, the size of the coefficients for *Party Identification* are between a half and a third of the size of those accounting for *Internet*. 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*

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[84] Wooldridge 2009.

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

vote switching. Online newsgathering, our key independent variable, produces a twice as large shift in the opposite direction.

Alternative independent variable specification – Gathering news via Twitter

Our analyses have thus far examined the effects of browsing the Internet for politically relevant news, understood in a broad sense. In this section, we seek to get a better understanding of the relationship between uncertainty and online newsgathering by specifying an alternative, more specific, instrumental variable. To this end, we employ the INES question on whether respondents had made use of Twitter.com to follow the news in the run up to the election.

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, video and audio files. Users can also 'retweet' (i.e., copy and forward) other user's posts to their followers, or address comments 'at' other users using the '@' symbol. Twitter.com's user-created content dynamic marks it as a 'Web 2.0' platform, while the relationships it establishes between account holders marks it as a social networking site.[86]

Chadwick[87] argues that one of the defining structural features of 'Web 2.0' platforms like Twitter.com lies in their potential to facilitate 'by-product learning', a form of 'accidental' exposure to politically-relevant information. The likelihood that users will be exposed to political information, while not actively searching for political news, is thus maximized in the Twitter.com environment. Twitter.com embodies the

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[86] Boyd and Ellison 2007.

[87] Chadwick 2012; Chadwick 2009.

fragmentation of news sources that we discuss in explaining the rationale behind H$_2$.

Moreover, given the dynamic and diverse nature of messages that may pop up one one's Twitter feed, the likelihood of such information to run contrary to one's prior preferences (triggering increased electoral uncertainty) is also high.

On the other hand, each Twitter.com account-holder decides whom to follow, and thus may choose to build their own 'echo chamber' by following only those other users who they know are consonant with their prior preferences. If this usage pattern is highly pervasive, then using Twitter.com may serve to reinforce voters' pre-existing electoral preferences.

Conover et al.'s [88] analysis of Twitter.com points to an environment that is simultaneously preference-reinforcing (they find that 'retweeting' networks exhibit a highly partisan structure) and preference-challenging (they uncover far more partisan heterogeneity in the user-to-user mention network, which facilitates argumentative challenging). As such, the use of *Twitter* as an alternative instrumental variable allows us to have greater confidence that the online environment encountered by users has the requisite characteristics to trigger either of the mechanisms that underlie our research hypotheses. In Table 4 we present the results of an identical analysis to that reported in Table 3, the sole difference being that *Twitter* rather than *Internet* was the instrumental variable used to capture online newsgathering.

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[88] Conover et al. 2011.

Table 4. Instrumental variables (IVREG2) models of electoral uncertainty, *Twitter* instrumented using *Broadband Coverage**.

	(7)	(8)	(9)	(10)	(11)	(12)
	Potential for vote switching			*Openness*		
Twitter	**3.83***	**3.45***	**5.58***	**0.32***	**0.34***	**0.50***
	(0.58 - 7.08)	**(0.22 - 6.69)**	**(0.47 - 10.69)**	**(0.05 - 0.58)**	**(0.06 - 0.61)**	**(0.07 - 0.92)**
Socio-Economic Status						
Gender	-0.12	0.08	-0.03	-0.02*	-0.01	-0.02
	(-0.37 - 0.14)	(-0.17 - 0.32)	(-0.33 - 0.26)	(-0.04 - -0.00)	(-0.03 - 0.01)	(-0.04 - 0.01)
Education	0.09	0.13*	0.06	0.01*	0.01*	0.01
	(-0.02 - 0.21)	(0.01 - 0.25)	(-0.10 - 0.22)	(0.00 - 0.02)	(0.00 - 0.02)	(-0.00 - 0.02)
Age	-0.00	0.00	0.00	-0.00	0.00	0.00
	(-0.02 - 0.01)	(-0.01 - 0.02)	(-0.02 - 0.02)	(-0.00 - 0.00)	(-0.00 - 0.00)	(-0.00 - 0.00)
Class	0.03	0.03	0.07	0.00	0.00	0.01
	(-0.08 - 0.13)	(-0.08 - 0.13)	(-0.07 - 0.20)	(-0.01 - 0.01)	(-0.01 - 0.01)	(-0.01 - 0.02)
Political Involvement						
TV		-1.08**	-1.77**		-0.04	-0.09**
		(-1.72 - -0.44)	(-2.44 - -1.09)		(-0.10 - 0.02)	(-0.14 - -0.03)
Newspaper		0.34	0.09		0.02	-0.00
		(-0.09 - 0.77)	(-0.48 - 0.65)		(-0.02 - 0.05)	(-0.05 - 0.04)
Fragmentation		-0.26	-0.12		-0.02	-0.01
		(-0.87 - 0.35)	(-0.85 - 0.62)		(-0.07 - 0.03)	(-0.07 - 0.05)
Radio		-0.39	-0.23		0.00	0.00
		(-0.82 - 0.04)	(-0.74 - 0.29)		(-0.04 - 0.04)	(-0.04 - 0.05)
Party Identification		-0.99**	-0.86**		-0.06**	-0.05**
		(-1.33 - -0.65)	(-1.26 - -0.46)		(-0.09 - -0.03)	(-0.08 - -0.02)
Interest in Politics		-0.13	-0.15		-0.02	-0.02
		(-0.30 - 0.05)	(-0.38 - 0.08)		(-0.03 - 0.00)	(-0.04 - 0.00)

Candidate Visit		-0.11	-0.31		-0.01	-0.02
		(-0.39 - 0.16)	(-0.75 - 0.13)		(-0.03 - 0.01)	(-0.06 - 0.01)
Offline Network		0.34*	0.63**		0.04**	0.05**
		(0.03 - 0.66)	(0.20 - 1.06)		(0.01 - 0.07)	(0.01 - 0.09)
Political Attitudes and Opinions						
Vote Matters			-0.09			-0.00
			(-0.22 - 0.03)			(-0.01 - 0.01)
L/R (Centre)			-0.11			0.00
			(-0.68 - 0.46)			(-0.05 - 0.05)
L/R (Extremes)			-0.38			-0.01
			(-0.97 - 0.21)			(-0.06 - 0.04)
Duty vs. Choice			-0.42*			-0.02
			(-0.79 - -0.04)			(-0.05 - 0.01)
Previous Fianna Fáil			0.39*			0.03*
			(0.09 - 0.69)			(0.00 - 0.05)
Distance from City			-0.01*			-0.00
			(-0.01 - -0.00)			(-0.00 - 0.00)
Constant	-2.67**	-1.58**	-0.21	0.66**	0.68**	0.72**
	(-3.73 - -1.61)	(-2.65 - -0.50)	(-1.51 - 1.10)	(0.58 - 0.75)	(0.58 - 0.77)	(0.61 - 0.82)
Broadband Coverage (first stage)	0.08**	0.08**	0.06**	0.08**	0.08**	0.06**
	(0.05 - 0.10)	(0.06 - 0.11)	(0.03 - 0.09)	(0.05 - 0.10)	(0.05 - 0.10)	(0.03 - 0.09)
Observations	1,754	1,576	1,200	1,635	1,466	1,127
Cragg-Donald Wald F statistic	45.26	45.37	23.57	43.00	41.15	21.88

As we can see from Table 4, the results are nearly identical to those presented in Table 3. 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% level for both dependent variable specifications. Once again, the scale of the observed effect is considerably greater than the effect of party identification, though we repeat our caveat about the relatively large standard error attached to this coefficient. The observed direction and scale of the effects of using Twitter.com are thus similar to those of using the Internet 'at large'. Again, this supports the contention that the Internet's capacity to impart large amounts of information, from a highly fragmented set of providers, makes it a driver of greater electoral uncertainty.

Robustness Checks for Imbalances across groups

As we discussed above, balancing areas with and without broadband coverage is key to correctly identifying the effect of the Internet on voter uncertainty. As such, we implement two types of additional analysis designed to sharpen our identification strategy, and to provide greater confidence in the validity of our core finding.

First, although areas with broadband coverage and areas without proved to have similar features in terms of several possible confounding factors, some minor imbalances remain in a few variables. In order to assess whether these imbalances drive our results, we look closely at those areas whose distance from the closest unit in the other group is smaller than 15 Km, and we restrict our analysis to those observations, as this allows us to address the concern that relevant socio-economic

characteristics may be geographically clustered.[89]

Second, we implement a matching technique to further balance constituencies with and without broadband. Specifically, we match our instrument on the geographical variable (*Distance from City*), the two ordinal covariates that are slightly unbalanced, i.e. *Education* and *Vote Matters*, and on the five dummies that have different proportions, i.e. newspapers, duty vs. choice, L/R (center), L/R (extremes), and party identification.[90]

This test is both important and quite conservative. If these pre-treatment variables, which are somewhat unbalanced, affect the dependent variables, our instrumental variable estimation does not address the issue of confounding factors. Put simply, the test is important because effect of the Internet on electoral uncertainty 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 12 module of the Coarsened Exact Matching Software.[91]. Table 5 below reports estimate results for both dependent variables controlling for distance from the closest unit in the other group (models 13 and 14) and matching samples on the imbalanced control variables discussed above (models 15 and 16).

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[89] 15 Km is the 90th percentile of the variable capturing the distance from the closest unit in the other group. We are unable to choose smaller values, e.g, the mean or the median, since we would lose a large number of observations and our models would not converge.

[90] Dummies cannot be coarsened to any specific values. We have coarsened the variable *Distance from City* at the value of 15 in line with Models 13 and 14, and *Education* and *Vote Matters* at their median values.

[91] Blackwell et al. 2009; Iacus, King and Porro 2012.

Table 5. Instrumental variables (IVREG2) With robustness checks for across group imbalances: Distance from closest unit in the other group smaller than 15 Km (13 and 14), and matching (15 and 16). *Internet* **instrumented using** *Broadband Coverage**.

	(13) *Potential for vote switching*	(14) *Openness*	(15) *Potential for vote switching*	(16) *Openness*
Internet	**2.79***	**0.20***	**2.67***	**0.20***
	(0.12 - 5.46)	**(0.00 - 0.39)**	**(0.26 – 5.07)**	**(0.02 - 0.38)**
Socio-Economic Status				
Gender	0.05	-0.01	0.05	-0.00
	(-0.22 - 0.32)	(-0.03 - 0.01)	(-0.21 – 0.32)	(-0.02 - 0.01)
Education	0.03	0.01	0.04	0.00
	(-0.12 - 0.19)	(-0.00 - 0.02)	(-0.12 – 0.20)	(-0.00 - 0.02)
Age	-0.01	-0.00	-0.00	-0.00
	(-0.02 - 0.01)	(-0.00 - 0.00)	(-0.01 – 0.00)	(-0.00 - 0.00)
Class	0.04	0.00	0.03	0.00
	(-0.07 - 0.16)	(-0.00 - 0.01)	(-0.07 – 0.15)	(-0.00 - 0.01)
Political Involvement				
TV	-1.65**	-0.08*	-1.95**	-0.10**
	(-2.34 - -0.96)	(-0.13 - -0.02)	(-2.53 – -1.38)	(-0.16 - -0.04)
Newspaper	-0.39	-0.03	0.36	0.02
	(-1.16 - 0.37)	(-0.09 - 0.03)	(- 0.21 – 0.94)	(-0.01 - 0.07)
Fragmentation	0.22	0.01	- 0.27	-0.12
	(-0.33 - 0.77)	(-0.03 - 0.05)	(- 0.95 – 0.40)	(-0.06 - 0.04)
Radio	-0.07	0.01	- 0.04	0.02
	(-0.55 - 0.41)	(-0.03 - 0.05)	(- 0.55- 0.46)	(-0.01 - 0.06)
Party Identification	-0.69**	-0.04*	- 0.72*	-0.03*
	(-1.07 - -0.32)	(-0.07 - -0.00)	(- 1.12 - -0.33)	(-0.07 - -0.00)

	(1)	(2)	(3)	(4)
Interest in Politics	-0.20	-0.02	- 0.16	-0.17
	(-0.46 - 0.07)	(-0.04 - 0.00)	(-0.43 – 0.09)	(-0.04 - 0.00)
Candidate Visit	0.01	0.01	-0.04	0.00
	(-0.29 - 0.31)	(-0.01 - 0.04)	(-0.32 - 0.24)	(-0.01 - 0.02)
Offline Network	0.35	0.02	0.37	0.02
	(-0.07 - 0.77)	(-0.02 - 0.05)	(-0.04- 0.80)	(-0.01 - 0.05)
Political Attitudes and Opinions				
Vote Matters	-0.01	0.01	0.03	0.00
	(-0.09 - 0.08)	(-0.00 - 0.01)	(-0.12 - 0.05)	(-0.00- 0.01)
L/R (Centre)	0.03	0.01	0.11	0.04
	(-0.48 - 0.54)	(-0.03 - 0.05)	(-0.55- 0.78)	(-0.01 - 0.10)
L/R (Extremes)	-0.22	-0.01	-0.19	0.02
	(-0.79 - 0.34)	(-0.05 - 0.03)	(-0.90- 0.51)	(-0.03 - 0.08)
Duty vs. Choice	-0.31	-0.01	- 0.43*	-0.01
	(-0.67 - 0.04)	(-0.04 - 0.02)	(-0.76 - -0.09)	(-0.04 - 0.00)
Previous Fianna Fáil	0.29*	0.02	-0.26	0.01
	(0.00 - 0.58)	(-0.00 - 0.04)	(-0.03 - 0.55)	(-0.00 - 0.03)
Distance from City	-0.00	-0.00	-0.00*	-0.00
	(-0.01 - 0.00)	(-0.00 - 0.00)	(-0.0 - -0.00)	(-0.00 - 0.00)
Constant	-0.36	0.72**	-0.14	0.70**
	(-1.67 - 0.94)	(0.62 - 0.82)	(-1.44 - 1.14)	(0.59 - 0.81)
Broadband Coverage (first stage)	0.12**	0.14**	0.13**	0.14**
	(0.09 - 0.16)	(0.10 - 0.17)	(0.10- 0.17)	(0.10- 0.18)
Matching	***No***	***No***	***Yes***	***Yes***
Observations	1,078	1,015	1097	1027
Cragg-Donald Wald F statistic	43.80	52.13	51.45	58.21

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 3. Even with this highly conservative specification, the observed effect of online newsgathering on political uncertainty is positive and significant with at least 95% confidence across all models.[92]

Conclusions

Our goal in this article has been to identify the 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 analysts who seek to evaluate 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 campaign affects voters' uncertainty with regard to their vote choice and have found evidence that browsing the Internet for political news – via both regular websites and web 2.0 platforms – leads to higher levels of electoral uncertainty. We implemented a quasi-experimental analytical approach built on geographic 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

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[92] We also demonstrate in the Appendix (Table A-3) that these findings are robust to dependent variable specifications designed to deal with outlier values.

respondents, which allowed us to match individual respondents 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 replicable contribution to the study of the effects of Internet use by voters during election campaigns.

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. By integrating Twitter into our empirical analysis, we capture the more user-driven experience of accessing social networks, and, again, we found that use of this platform lead to an increase in voters' uncertainty. In this respect, we can conclude that use of the Internet as a source of news seems to produce an effect on uncertainty. Most research on media effects is concerned with the content carried on a given medium, Sundar notes that 'the term media effects is somewhat of a misnomer because the vast majority of research in this tradition

investigates effects of information delivered by mass media rather than effects of the media technologies themselves.'[93] However, our results suggest that the particular structure of a medium can and does produce effects on people's political evaluations. The availability of rich and diverse information on the campaign, party policies and political actors at the cost of only a few clicks of a mouse –via either regular websites or social networking platforms – appears to fuel uncertainty when it comes to deciding how to cast one's vote.

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 due to the high aggregate volatility of its outcome, but also because of longer-term characteristics of the Irish political system, namely low levels of partisan identification in the electorate and a lack of ideological competition among the main Irish parties. It is plausible, and in line with the theoretical arguments that we used to construct Hypothesis 1, that in a more ideologically-polarized political environment, use of the Internet as a news source may lead to lower levels of uncertainty among voters. Nonetheless, the dynamics that we have mapped out for the Irish case may be reproduced in other political systems, especially those characterised by low levels of political polarisation.

Furthermore, the mechanism(s) underlying the effects identified in this article 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

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[93] Sundar 2009, 545.

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. Experimental research designs, 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 more electorally uncertain than their unwired counterparts, and this difference appears to be attributable to the influence of consuming political news online.

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