Strength in Numbers: Multiple Measures of Media Ideology*

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Abstract

Attempts at quantifying media ideology have generally taken one of two routes. Scholars have either exploited the similarity between phrases used by the news media and the politicians, or they have exploited the differences in composition of the audiences. We forgo the conventional reliance on one set of cues. Instead, we pool both text and audience based measures to estimate the ideological location of a number of media sources in the UK. The UK presents an appropriate environment for carrying out our research given ideology of members of parliament cannot be simply gotten via voting records. We combine corpora of parliamentary speech and party manifestos with Twitter data to produce more reliable measures of news media ideology and insight into differences between the two metrics.

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According to Edmund Burke, the news media's capacity to hold the ear of the public makes it an equal partner in a democracy, a veritable "fourth estate" (Carlyle 2003). If power is what makes the news media an equal shareholder, it is its independence, and how dutifully it fulfills its responsibility, that explains its contribution to the success of a democracy. If the media favors one party (or ideological position) over another, its capacity to hold the politicians accountable—by informing the public about the functioning of the government—is necessarily diminished (see, for e.g., Larcinese, Puglisi and Snyder 2011). And if the media doesn't present information on all sides of an issue, or cover candidates and elected officials fairly, public opinion may skew toward suboptimal alternatives.

Such concerns have led to a large literature on the measurement and impact of various kinds of bias in the news media. Extant research suggests that the news media disproportionately focuses on 'negative' news, for e.g., coverage of declines in stock market outstrips coverage of gains (Goetzmann, Kim and Shiller 2016), that local news media fixates on violent crime — share of local news' coverage devoted to violent crime is manifolds actual share of violent crime (Gross 2006), and that local news exhibits racial bias—some local news media outlets show black criminals at higher rates than at which they are arrested (Dixon and Linz 2000). Research also suggests that such biases influence people's voting and policy preferences (Gilens 2009; Gilliam Jr and Iyengar 2000, see, for e.g.,).

More recently, the rise in elite and mass polarization in the US and the UK (McCarty, Poole and Rosenthal 2016; Iyengar, Sood and Lelkes 2012) has led to an increase in accusations of partisan bias (Ladd 2011). And while accusations of bias can't always be taken at face value, given the ubiquity of 'sidedness'-biases (Vallone, Ross and Lepper 1985), the depth of concern has been severe enough to foment inquiry. As a result, a growing literature attempts to measure media bias, and impact of consumption of biased media on voting decisions, policy opinions, and representation (see, for e.g., Groseclose and Milyo 2005; Gentzkow and Shapiro 2010; DellaVigna and Kaplan 2007). The literature has taken greater urgency post studies suggesting that biased media

can have a tangible impact on vote shares (DellaVigna and Kaplan 2007; Martin and Yurukoglu 2014).

Hitherto, most of the attempts at measuring partisan bias have fallen into two camps. The first assumes that elected officials hold ideological positions, and that their voting records and speech reveal these positions. Armed with the speech of members of Congress, scholars turned to news sources to examine the similarity of their communication to that of politicians. If Republicans, for example, use the phrase 'death tax' instead of 'estate tax' more than say Democrats, we learn something about the ideology of a news media outlet that exhibits the same pattern (e.g., Gentzkow and Shapiro 2010; Groseclose and Milyo 2005).

A second camp uses audience composition to understand bias. The assumption here is that a more liberal (conservative) audience will gravitate toward more liberal (conservative) news sources. Early work in this area was based principally on survey evidence, with respondents being asked questions about their own ideology and then the frequency at which they watch news channels or programs (see Stroud 2011, for a recent example). More recently, scholars have taken advantage of behavioral measures, including patterns of following media outlets on social media. If a news outlet attracts liberal (conservative) followers, then one can estimate media slant, and order the ideology of news outlets accordingly (Gentzkow and Shapiro 2011; Barberá and Sood 2016).

In this paper, we forgo the typical strategy of using just one source of information, and instead rely on multiple sources. We do so for two reasons: a) to build more reliable measures, b) to build more granular measures—measures by 'topic.' We pool both text and audience based measures to estimate ideological location of a large set of media sources in the United Kingdom, an interesting and novel context for two reasons. The UK, with its particularly diverse and rich media environment, featuring both publicly funded and commercial media organization, numerous broadsheet publications, and tabloid presses, not to mention local media outlets, provides a great case study. And secondly, it is a country where politician's votes carry little ideologi-

cal information beyond party due to whipping. We estimate the ideology of a large set of media sources using a large novel text corpora of UK news media—we have crawled more than 2 million pages—and data on Twitter followers of both politicians and media outlets. We present insights into how slant of news sources relates to audiences in the UK.

Assessing Media Ideology

Accusations of political slant against the news media are common. And some scholars have exploited these perceptions of bias to measure the ideology of news media (Dilliplane 2011; 2014). Perceptions, however, do not always capture reality, particularly where media bias is concerned. A great deal of research shows that people tend to evaluate the credibility and evenhandedness of a piece of information based on whether or not it is congenial to their prior attitudes—rating uncongenial information as less reliable and more skewed than congenial information (see, for e.g., Vallone, Ross and Lepper 1985; Lord, Ross and Lepper 1979; Khanna and Sood 2015). Unsurprisingly, thus, a large share of the variation in ratings of news media ideology is explained by rater's partisanship (Sood and Lelkes 2016).

Given the problems with the use of perceptions of media organizations' ideology, many scholars have forgone them. Instead, some rely on exploiting the audience composition. The theory goes that in a free capitalist media system, people's choices reflect their preferences. Thus, based on self-reports of what news media people consume, we could use the proportion of audience of a media outlet that is Republican as an indicator of its ideology. But serious concerns remain about reported consumption—people tend to greatly overstate the extent to which they watch both partisan and non-partisan news (Prior 2013). In lieu of these concerns, some scholars derive audience metrics from passive observation of media consumption (Flaxman, Goel and Rao 2014).

But even if we have a perfect measure of the audience, we cannot simply assume a one-to-

one relationship between audience' partisanship (or ideology) and their choice to consume news from a particular outlet. The relation between viewership and preferences is complex (Sood and Lelkes 2016). For instance, people's viewing behavior can be affected by small changes in convenience (Martin and Yurukoglu 2014). To address this particular critique, others have used more complex structural models linking behavior to preferences (and ideological locations) (Gentzkow and Shapiro 2011; Barberá and Sood 2016).

The basic structural model linking news media choices to ideological preferences includes a utility function that is sensitive to the distance between the news media and person's ideology. Such a structural model has some grounding in psychology. People like to consume ideologically congenial information because there are psychological costs to consuming messages uncongenial to their existing political beliefs Festinger (1962). Typically, the loss to utility as a result of consuming information different from the ideal point is taken to be quadratic (see, for e.g., Gentzkow and Shapiro 2011). Barberá (2015) and Barberá and Sood (2016) add to this standard model in three ways: a) limit the data to politically interested people—people whose news media consumption is more sensitive to ideology (Iyengar and Hahn 2009), b) validate the model and the choice of the subset using a training set (Congress) for which the ideology is known, and c) allow for fixed effects and other covariates, like location, number of subscribers, etc. to regress out other reasons why someone may subscribe to a news outlet. We opt for this particular strategy as one of the ways to measure ideology of the news media in the UK.

Estimating ideology based on audience composition is but one way of measuring ideology of the news media. Another promising way is systematic analysis of text. To that end, others have exploited expressed opinions on issues—positions expressed by newspapers on editorial pages to scale or score them (Ho and Quinn 2008; Puglisi and Snyder 2011; 2015). For example, (Habel 2012) uses editorial positions by the *New York Times* and *Wall Street Journal* on the same votes used by the ADA to scale members of Congress over a 50 year period. Here the limitation is that the ideology of the editorial page may be quite distinct from bias in news coverage—for example, the

New York Times is relatively moderate in its news coverage (Gentzkow and Shapiro 2010) while offering a distinctly liberal voice on its editorial pages (Habel 2012)—and editorial positions are both rare and self-selected.

To sidestep the issues with expressed positions, Groseclose and Milyo (2005) devised an innovative indirect approach to measuring media bias. Members of Congress give speeches in Congress. And during these speeches, politicians reference think tanks. And some of the think tanks that are referenced have distinct ideological positions, measures of which can be readily obtained from the interest group, Americans for Democratic Action (ADA). Groseclose and Milyo (2005) use these think tank citations to derive a relationship between think tank citations and ideology. And then use that relationship to impute ideology of media outlets, which also cite think tanks. Building on Groseclose and Milyo (2005), Gentzkow and Shapiro (2010) look at broader language use, and impute ideological scores for mass media accordingly. A closer inspection of some of the models suggests that while the models are very good at discriminating across parties, they are poor at discriminating within parties (Barberá and Sood 2016; Gentzkow, Shapiro and Taddy 2015). Additional challenges associated with these indirect methods include discriminating between slant and agendas (see, for e.g., Quinn et al. 2010). However, we pool insights gleaned from these models with audience based models in an attempt to build more reliable and more granular estimates.

The British Context

The UK has a liberal media system (Hallin and Mancini 2011). Like the US, the UK features a profit-oriented media with low levels of government regulation, and independence from political parties (Hallin and Mancini 2004). Yet there are several features that distinguish it from the US. The UK is particularly well known for its subsidized and regulated broadcast outlet, the British Broadcasting Corporation (BBC), which is often the focus of both public concern and scholarly

work investigating bias given the potential for government's role in influencing what is broadcast. Beyond the BBC, there exists a loosely regulated and profit-oriented broadcast and print media. The print outlets range from the widely respected broadsheets, such as *The Telegraph* (associated with conservative views, referred to by its critics as "The Torygraph"), *The Guardian* (its putative liberal counterpart), *The Times of London* (understood to be more middle of the road), to outlets carrying more soft news, such as *The Daily Mail*, and *The Sun*, the most widely circulated newspaper. Beyond national broadcast channels and presses, there are also regional ones—including, for example, counterparts with names such as *Scottish Television* (STV) in contrast to the national *Independent Television* (ITV), or *The Scottish Sun* to *The Sun*. Aside from these is an abundance of local newspapers. (For a helpful overview of the British media, see Eldridge, Kitzinger and Williams (1997).)

A variety of concerns naturally attach to liberal media systems. At one end, there are worries that profit-maximizing businesses will replace 'hard news' with 'news' that sells— sensationalist stories, horse race coverage, etc. (Graber and Dunaway 2014). At the other end, there are worries that what little hard news is there will carry the 'profit-maximizing' slant (Gentzkow and Shapiro 2010). And the UK is immune to neither of these concerns. In this article, we focus on concern about ideological slant. It is a worry that has a long history. For instance, for more than 40 years, scholars at the University of Glasgow have been conducting studies of language use by media, assigning liberal or conservative values to word choices (conceptually in like manner to dictionary methods that have in recent years become widespread in political communication (Young and S 2012)), with the Glasgow group finding evidence of bias toward those wielding political and economic power (Glasgow Media Group 1976; 1980; 1982).

The other British attribute relevant to our research is its politics. In the US, preferences of both the politicians and the mass public are well-explained by a single left-right dimension (see, Poole and Rosenthal 2007; Clinton, Jackman and Rivers 2004; Jessee 2009; Tausanovitch and Warshaw 2013). In the UK, politics is more complex, particularly given the presence of multiple

parties voices their own issues and interests. Aside from the conventional left-right parties—Labour and Conservatives ("Tories")–that have dominated British politics for decades, recently, a number of additional parties have gained prominence, including the Liberal Democrats (who were in coalition with the Conservatives prior to the 2015 election), and non-establishment parties such as the SNP (Scottish Nationalist Party), and UKIP (UK Independence Party). The SNP, with one of its principal tenets surrounding independence for Scotland, emerged as a force in national politics in the wake of the 2015 General Election, capturing a startling 56 of the 59 Scottish seats in Parliament, while UKIP attracted 12.6% of the vote in 2015, and was a leading force behind the 2016 Brexit vote–Britain's successful referendum on exiting the European Union. Beyond these, Parliament has representation from prominent regional parties including those in Northern Ireland (Democratic Unionist and Sinn Féin), and Wales (Paid Cymru). Despite the diverse set of parties and their interests, the left-right dimension remains the central fulcrum of British politics. And our aim in this paper is to estimate position on the conventional left-right axis of politics.

Next, we describe our measurement models and our data.

Measuring Ideology on Social Media

Of the various ways we can learn about ideology from the social media, as we note above, following Barberá (2015); Barberá and Sood (2016), we opt for exploiting the follower network. We assume that politically interested people on social networks tend to follow ideologically proximate news sources. And assume that the loss in utility from following an outlet is a quadratic function of the Euclidean ideological distance between the person and the outlet. Letting i enumerate users, and j media outlets, and letting $\theta_i \in \mathbb{R}$ denote the ideal point of the follower i, $\phi_j \in \mathbb{R}$ the ideal point of the media outlet j, α_j, the baseline probability of following media outlet j, β_i a user-specific parameter that accounts for systematic user level variation, and letting γ

be the normalizing constant, the final model takes the following form:

$$\underset{y_{1,\ldots,J}}{\arg\max} \left[\sum_{j=1}^{J} \alpha_j(y_j) - \beta_i(y_j) - y_j(\gamma||\theta_i - \phi_j||^2) \right] \tag{1}$$

Like Barberá and Sood (2016), given the size of the follower network, rather than estimate the spatial model directly, we instead use correspondence analysis (Greenacre 1984; 2010), which approximates the maximum likelihood solution for a one-dimensional spatial model (ter Braak 1985).

Next, we apply this model the model to the follower networks of politicians and media sources. We obtained the Twitter handles of politicians in two ways. First, we scraped the list of all current MPs who use Twitter, 573 of the 650, from *TweetMinister*. For MPs serving from the period following the 2010 general election to the 2015 general election, we located Twitter handles manually. This gave us an additional 61 Twitter handles for a total of 634. Armed with these Twitter handles, using the Twitter REST API, we collected the follower networks.

Our Twitter handles for media outlets and journalists were gathered in several ways. For newspapers, we began with a list of newspapers that publish regular editions, including both nationally circulating outlets (both "broadsheets" such as *The Guardian* and "tabloids" such as *The Sun*) and regional and local newspapers. We then harvested their Twitter accounts, either directly from newspaper websites, or manually using Twitter searches. For our collection of 855 outlets, we located 570 Twitter accounts. For television news providers, we included the national news service providers which included BBC News; BBC Newsnight; BBC Question Time; BBC Daily Politics Show; Channel 4 News; ITV News; Sky; and STV News. We collected their Twitter accounts using Twitter searches. We also included Twitter handles for radio news providers, which included *BBCs Radio 4 Today* and *PM*; *BBC World Service*; and *Leading Britain's Conversation*.

For journalists working for both print and broadcast media, we turned to the source *Journalisted*, a website run by the Media Trust Standard that provides a directory of journalists as a

public service. Here we located the names of what we perceived as active and potentially influential journalists, defined as those who published at least once per week according to statistics available through Journalisted. We then turned to Twitter searches to collect the handles of these writers. We located 306 journalists, and of these, we found 291 Twitter accounts. That 95 percent of our journalists use Twitter also testifies to the utility of social media as a tool for practitioners in the media field, and also for scholars in understanding questions in political communication. In total, then, we have 871 Twitter media accounts.

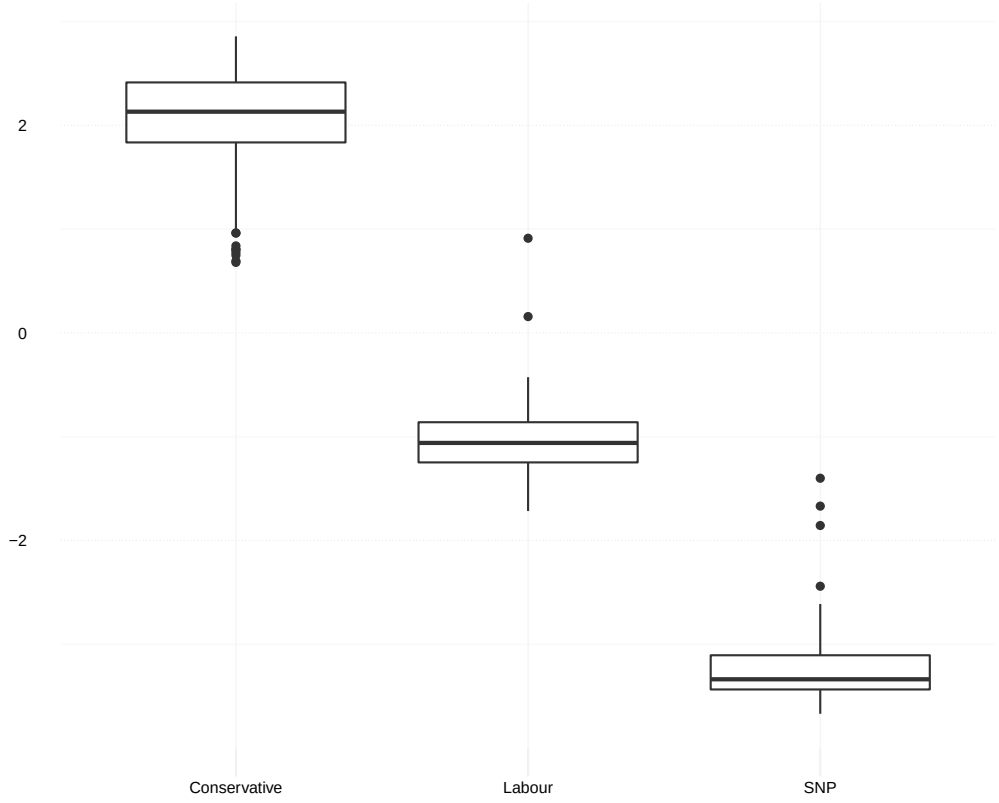
For the Twitter follower network, using the Twitter Rest API, we filtered those who were within the UK and who were followed at least 1 MP and 2 media outlets or journalists. Following an MP and two media accounts not only signals news and political interest on the part of the Twitter user, but these followers allow us to estimate measures of bias for the the media as we described above. Of our followers, to wean out defunct accounts, we further subset on those who had tweeted at least once in the past three months. From the XXXX followers of our 871 media accounts from which we began, we were left with 399,380 followers in our filtered set. Next, we created an adjacency matrix using this filtered set, and estimated the model.

To validate the model, we check its performance among a set whose partisan affiliations (and $\sim$ ideology) we know—politicians. Figure 1 shows box-plots of ideological location of parliamentary members by party. Our findings are concordant with expectations. On a scale where higher values denote more conservative ideology, The Conservatives are well above 0, with a median above 2 on our scale and the SNP, the most liberal of three parties, have a median below -3. Labour is also considerably to the left to Conservatives, with a median located below -1.

Measuring Ideology Using Speech

To estimate a model of how speech relates to ideology, we use parliamentary speech as training data. Compared to the US, the UK has two major limitations. Firstly, because of whipping, votes by members of parliament do not convey much information beyond party affiliation.

Figure 1: Distribution of Ideology of Politicians by Party



Thus, we can only learn about association between words and party. Secondly, the UK has multiple parties that cannot be cleanly aligned on the left-right axis. To account for that, we ignore speeches by members of any other party than Labour and Conservatives.

Our legislative speech data derive from two sources. First, we include 209,871 unique speeches by Labour and Conservative MPs from the period July 7, 2011 to March 11, 2014, available through the *Digging into Linked Parliamentary Data* project (Marx 2009).[1] Not surprising, members of the Cabinet were frequent speakers, with Prime Minister David Cameron recording 5983 unique speeches. In contrast the leader of the Labour party, Ed Miliband, spoke in 914 instances. Second, like Gentzkow, Shapiro and Taddy (2015), we collect Robert's Rules of Order (Robert, Robert and Honemann 2011).

Our news corpora has over 7 million articles covering over 400 media sources between 2005 to 2015. We limit ourselves to news sources that publish in English, and for which we have more than 1000 transcripts since 2011. We further limit ourselves to data from 2010 and beyond from these sources. This leaves us with 2,742,735 transcripts from 255 sources. (See SI 3 for a complete list of media sources, the date ranges and number of transcripts per media source.)

We start with the standard text preprocessing stems of lemmatizing, removing 'stop words', and punctuation, losing all words less than 2 characters long, and converting all the words to lower case. We further assume a 1-, 2- Markov model of language, storing just frequency of bigrams and trigrams and removing order information. Next, as a way to get rid of parliamentary language, we remove all bigrams and trigrams that are part of Robert's Rules of Order. Since we plan to use the data to predict ideology of the news data, we take an additional step of removing bi- and tri-grams that don't exist in our news database. (See Gentzkow and Shapiro (2010) and Martin and Yurukoglu (2014), among others who have used similar assumptions in modeling similar text.) Next, we split the data into a test-set (20%) and a training-set (80%). Using these bigrams and trigrams, we estimated a Elastic Net regression (Zou and Hastie 2005), cross-validating

[1]Data are available from: http://search.politicalmashup.nl/about.html.

to tune the parameter (λ).

$$\hat{\beta} = \arg\min_{\beta} ||y - X\beta||^2 + \lambda_2|\beta|^2 + \lambda_1|\beta| \tag{2}$$

Using Elastic Net, we achieved an out-of-sample precision of .74 (see Table 1). The top 100 predictors of Labour and Conservative speech are listed in SI 2.

Table 1: Out-of-sample Performance of the model

party	precision	recall	f1score	support
Conservative	0.74	0.74	0.74	1981
Labour	0.74	0.74	0.74	2019

We used this trained model to predict the ideology of the news sources.

Results

We start by plotting social network based estimates of ideology of a few prominent news organizations (see Figure 2). All the prominent outlets we plot lie between the party medians, those a majority are slightly closer to the Labour party's median than the Conservative party. The median of the social network based ideology estimates of all the media sources in our data is also closer to the Labour median than the Conservative median (see Figure SI 1.1). The results are consistent with Barberá and Sood (2016), who find that American media outlets tend to lean toward the Democratic Party. The ordering of the prominent media outlets, if not the location, is consistent with their reputation. For e.g., Guardian is the closest to Labour, and well left of *The Daily Mail* or the *The Express*. Scaling text data offers similar insights. Our text based estimates put Guardian to the left of *The Daily Mail* or the *The Express*.

Next, we plotted accounts within various media companies (see Figure 3). Like Barberá and Sood (2016), we find intra-outlet ideological heterogeneity. However, it is more muted than

the US, where the ideological spread is much bigger. In the UK data, as one can see, estimates are, for the most part, between -1 and 1 on the x-axis, right in the middle of the Labour and Conservative medians. Thus journalists (or other accounts) for our media outlets are not typically as conservative as the median Tory, nor as liberal as the median Labour Party member, or certainly the SNP median. Based on the data, the *Economist* offers the greatest ideological spread.

Discussion

Accusations of news media bias are common. Some point to the fact that journalists tend to lean left, while others contend that publishers tend to be right-leaning. Still others note that both journalists and publishers may be able to distance themselves from their own views and ideas as they craft and distribute news content (see Morton 2005, p. 250-258 for an overview). Though, those working within media organizations note that editors and publishers exercise consideration discretion in determining what makes the news (Goldberg 2001; Orkent 2004).

These accusations are also concerning as research suggests a variety of consequences for biased news. For one, Ladd (2011) demonstrates that perceptions of media bias have been linked to a precipitous decline in media trust over time. Low levels of media trust have led citizens away from more balanced mainstream sources of news and into alternative and more partisan media, which has had consequences for citizens' political attitudes, beliefs, and voting behavior. Related, Arceneaux, Johnson and Murphy (2012) show that today's mainstream news environment presents oppositional voices sufficient to lead to polarization. Two, DellaVigna and Kaplan (2007) show that the expansion of Fox News—a source widely understood to favor conservative viewpoints—corresponded with an increase in the vote share for Republicans. Finally, returning to an older literature on the power of media endorsements of candidates in elections (e.g Erikson 1976), Ladd and Lenz (2009), exploit a rare shift in editorial endorsement on the part of a leading newspaper in Britain show that the political voice of the media can have significant influence on

Figure 2: Distribution of Journalist Ideology by Outlet

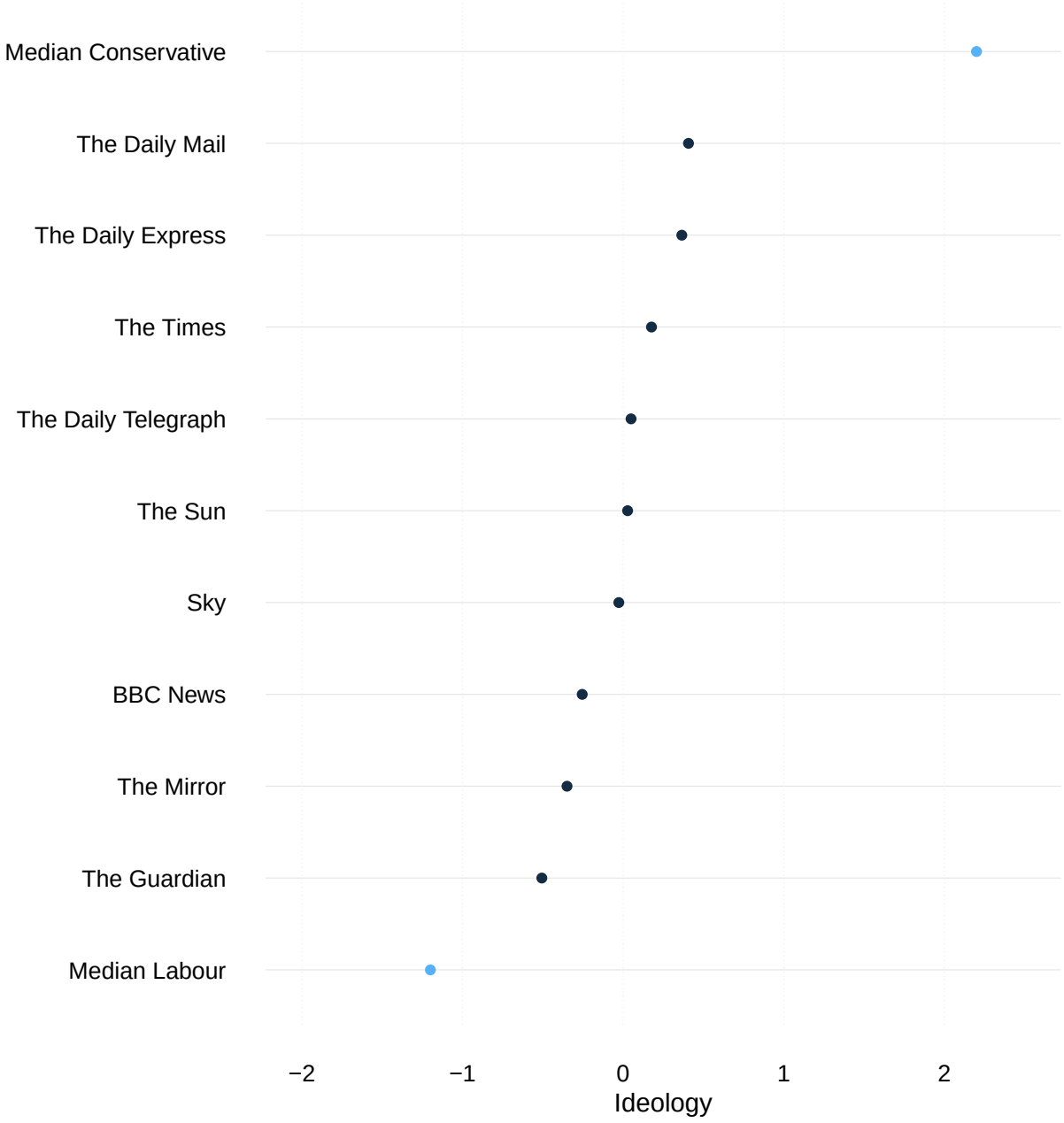
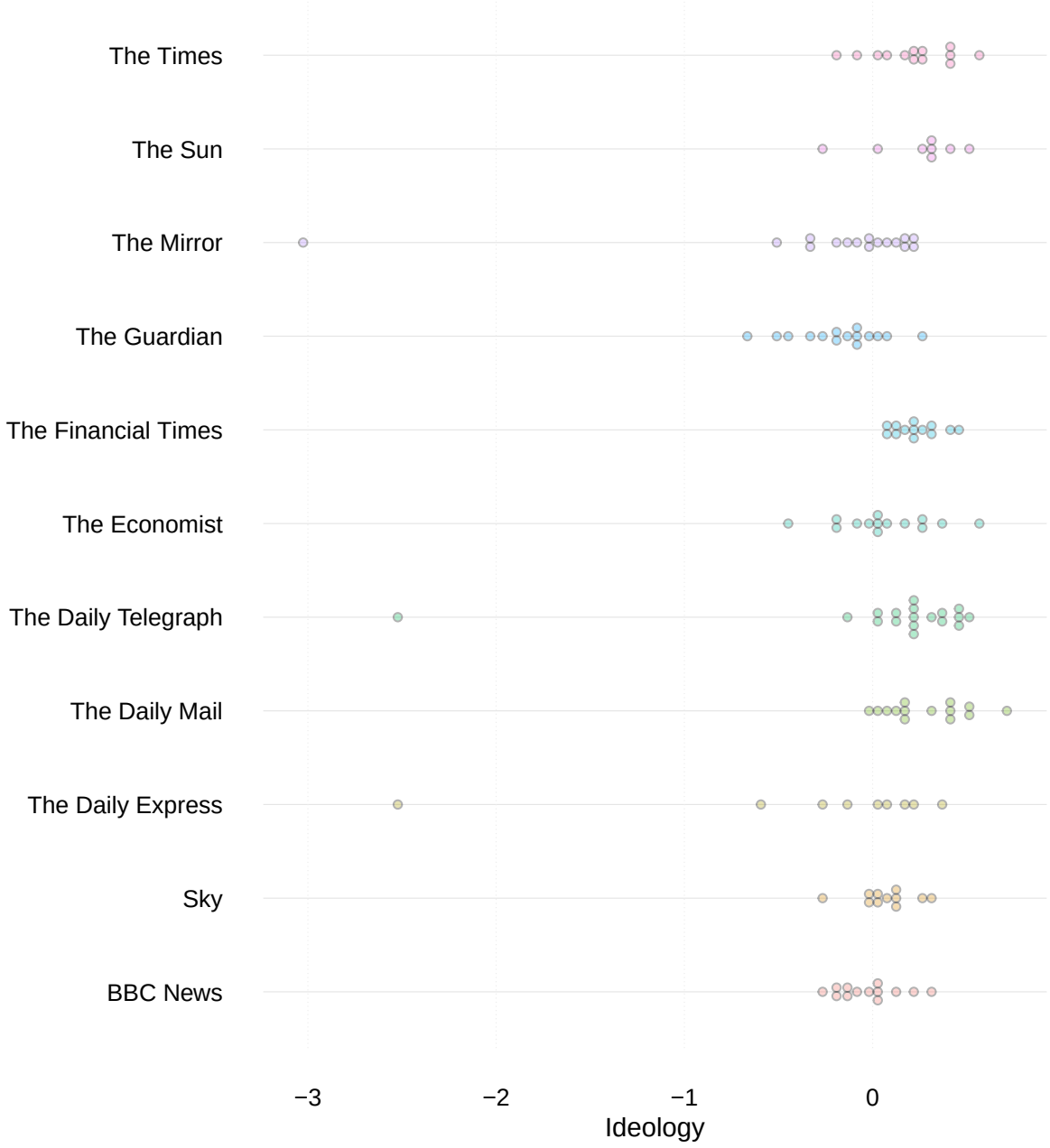


Figure 3: Distribution of Journalist Ideology by Outlet



its audience, with estimates of persuasion leading to vote change of the magnitude of 10 to 25 percent.

Methods of capturing bias, however, have been in want. Although in the past decade, scholars have turned to indirect measures based on either speech or social network data. The guiding principle for studies based on speech is that politicians communicate their left/right leanings in their statements made on the floor of the legislature. Media may also communicate their left/right leanings if they adopt similar “speech" patterns to left/right politicians. Concerning the second approach, here the rationale is that social media users make informed decisions about who to follow. The aggregation of these informed decisions helps reveal information about the entity being followed. If a given news outlet is followed by members of the public who also follow liberal politicians, then we can infer that the outlet biases its information. Our approach has been to rely on both speech and social network data to present new estimates of media bias for the United Kingdom. Although our exercise has been a computationally intense one, our methodology is translatable to other Western democracies where the data exist.

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Supporting Information

SI 1 Distribution of Ideology of Media Sources

Figure SI 1.1: Distribution of Social Network Based Estimates of Ideology of Media Sources

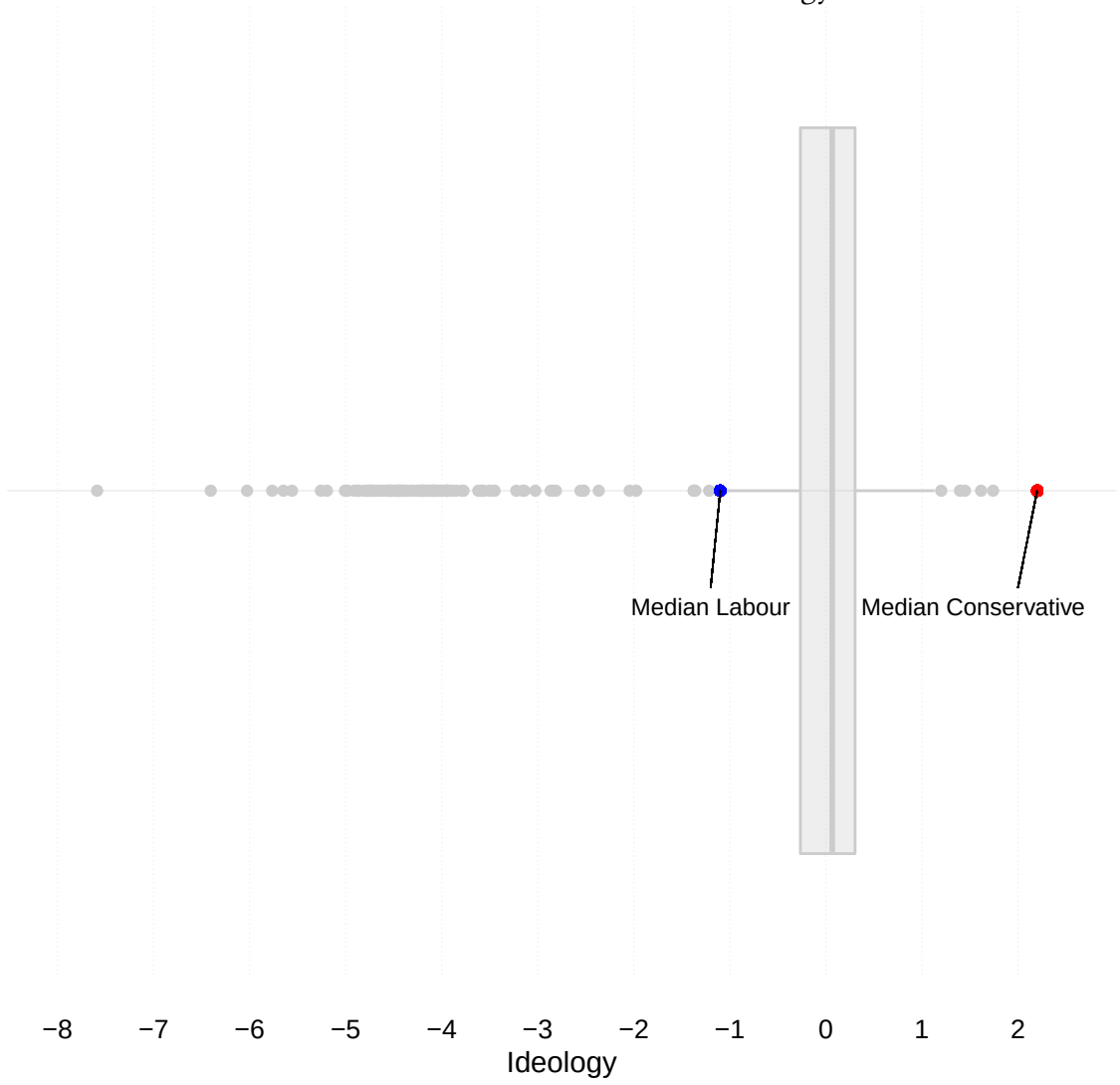


Figure SI 1.2: Distribution of Text Based Estimates of Ideology of Media Sources

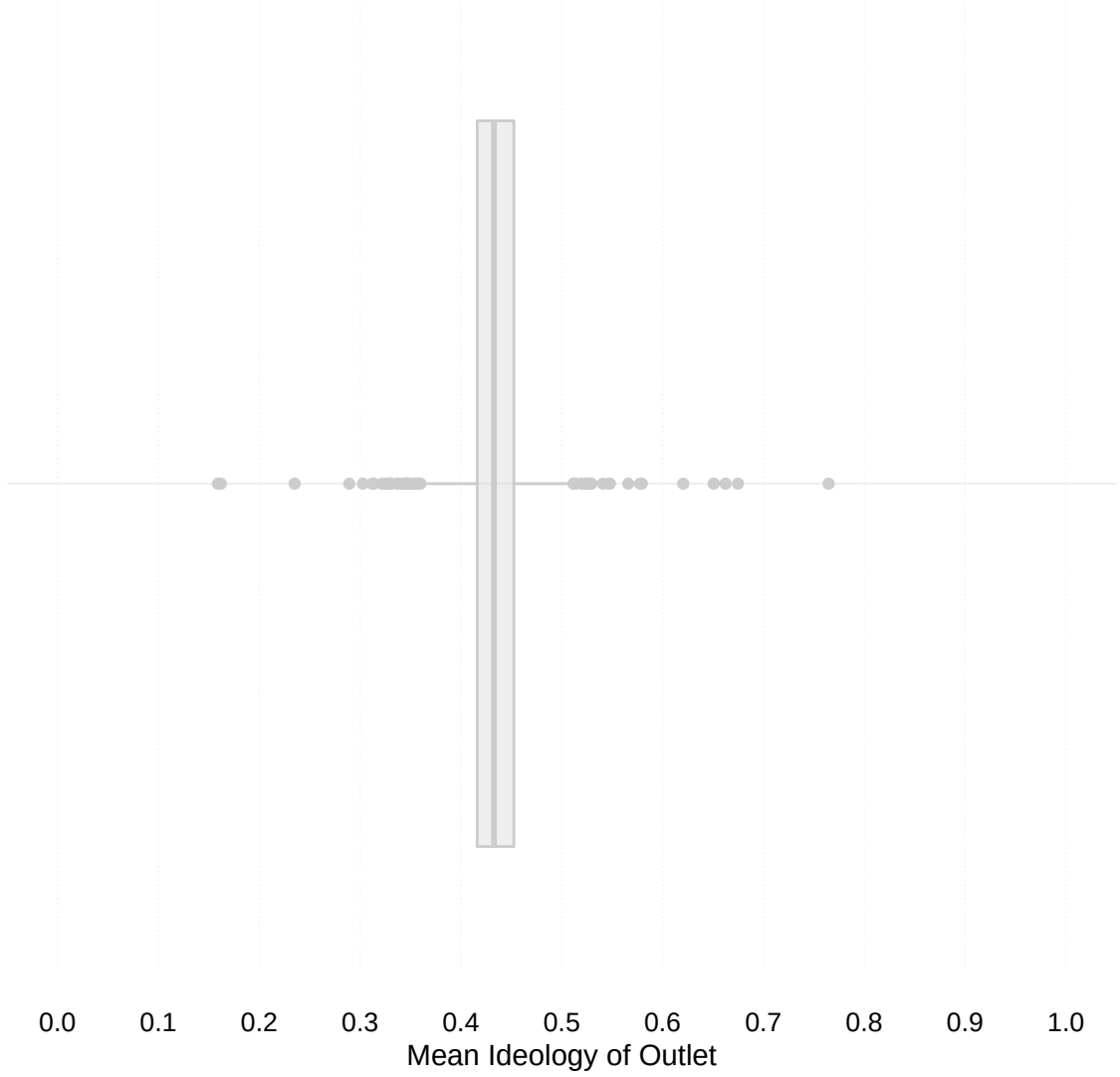


Figure SI 1.3: *
The x-axis maps proportion Conservative.

SI 2 Top 100 Predictors of Labour and Conservative Speech

Table SI 2.2: Top 100 Predictors of Labour Speech

friend home	also provid	social econom
tori govern	vast major	ask whether
tori parti	long overdu	intern commun
trade union	futur job	inform avail
opposit parti	later year	occupi territori
busi secretari	wast manag	see benefit
conserv parti	govern commit	east london
govern member	welfar state	govern support
south yorkshir	take forward	suppli chain
previou administr	first time	want thank
conserv member	follow consult	task forc
point rais	winter fuel	play field
bedroom tax	coal mine	direct travel
work peopl	averag earn	militari action
south wale	world bank	govern bodi
greater manchest	daili mail	death penalti
unit nation	missil defenc	said earlier
new deal	public interest	state consid
spend cut	transport system	conserv liber
also ask	econom social	crime reduct
labour govern	would inappropri	mani year
much welcom	let say	receiv benefit
good practic	govern open	school meal
lib dem	job growth	plan growth
way forward	bank levi	new member
next week	hope right	chang cours
work togeth	hunt dog	voluntari sector
tax cut	committe agre	chief inspector
poll tax	food bank	want take
manifesto commit	invest public	social justic
meet need	ensur peopl	year conserv
doubledip recess	integr transport	energi compani
local govern	tower hamlet	
peopl work	major chang	

Table SI 2.3: Top 100 Predictors of Conservative Speech

labour member	govern fail	point view
offici report	prime minist	meet target
minist may	minist give	state govern
secretari state	statement hous	counti council
financi secretari	govern think	interest hear
minist said	anoth exampl	govern account
labour parti	minist state	statut book
agre hous	grammar school	much hope
minist would	south west	urg minist
declar interest	govern claim	hope govern
govern seem	move hous	huge amount
good point	one thing	govern target
side hous	govern seek	high speed
coalit govern	home secretari	difficult time
polit correct	yet anoth	almost everi
tell us	budget deficit	conserv believ
public financ	none less	per annum
great pleasur	increas cost	get wors
may well	town centr	rule law
fact govern	person account	lord mandelson
red tape	district council	press releas
would like	minist say	mental ill
govern intend	govern failur	minist make
last govern	pupil premium	spend much
european court	quit lot	boundari commiss
minist confirm	said govern	lucki enough
new labour	reform public	one two
minist agre	govern tri	green deal
govern may	absolut right	cold war
would enabl	hold govern	govern one
would grate	margaret thatcher	special educ
hous built	one could	shadow minist
nation interest	fuel duti	
govern say	govern want	

SI 3 Summary of the Media Data

Table SI 3.4: Summary of the Media Data

Name	No. of Transcripts	From	To
24dash	17207	2010-01-04	2012-04-16
a World to Win Blogs	1550	2012-01-06	2014-09-29
Agra-Net.com	14322	2010-07-28	2014-03-21
Alert Net	15154	2010-09-01	2013-04-23
Alliance for Workers' Liberty	1646	2010-06-16	2014-07-08
Ananova	24495	2010-01-01	2011-11-21
Ananova - Orange News	8003	2010-03-20	2012-09-24
Andover Advertiser	3666	2010-01-01	2014-08-25
Asharq Al-Awsat	19107	2010-01-01	2013-02-26
Ayrshire Post	5639	2011-12-29	2013-06-30
Bakery and Snacks	2549	2010-01-01	2013-01-14
Ballyclare Gazette	1029	2010-01-04	2014-01-16
Ballymena Today	1327	2010-01-05	2011-12-05
Ballymoney Today	20310	2010-01-04	2011-02-09
Banbridge Leader	1256	2011-10-28	2012-07-05
Banbridge Today	28471	2010-01-01	2011-10-31
Banbury Guardian	17762	2010-01-01	2013-06-27
Barking and Dagenham Post	1160	2010-01-04	2010-09-23
Barnesley Chronicle	1575	2010-01-05	2011-12-06
Barnet Times	28793	2010-01-01	2011-12-13
Basingstoke Gazette	14265	2010-01-01	2014-07-12
Bbc - Leicester News	2093	2010-01-01	2012-04-11
Bbc News - Uk	2257	2012-04-18	2015-02-04
Bbc News Europe	79632	2010-07-15	2015-02-04
Beccles and Bungay Journal	1745	2010-01-02	2010-09-27
Bedford Times and Citizen	6884	2010-01-01	2011-11-07
Bedford Today	2484	2011-11-07	2013-06-28
Belfast Media	4475	2010-01-04	2011-09-15
Belfast Telegraph	154231	2010-01-01	2013-06-04
Belfast Today	1948	2012-01-01	2012-07-04
Berwick Today	2099	2010-01-04	2011-12-12
Bexhill Observer	3191	2010-01-01	2013-06-22
Bexhill Today	1900	2010-01-01	2011-12-05
Birmingham Mail	66692	2010-01-01	2014-07-08
Bishop's Stortford Citizen	50449	2010-01-01	2012-08-31
Blackburn Citizen	13311	2010-01-01	2014-05-23
Blackpool Today	3249	2010-01-01	2011-01-12
Bognor Regis Observer	2936	2011-12-07	2015-02-04
Bognor Today	5956	2010-01-01	2011-12-13
Bolton News	56276	2010-01-01	2013-06-30
Borehamwood and Elstree Times	61627	2010-01-01	2014-07-08
Boston Standard	1402	2011-12-13	2012-07-04
Boston Today	2215	2010-01-04	2011-12-13
Bracknell Forest Standard	4804	2010-01-22	2013-06-11
Bradford Telegraph and Argus	15179	2012-01-03	2014-05-23
Brechin Today	17536	2010-01-06	2011-12-11
Brighton Evening Argus	9113	2010-05-01	2014-09-06

Buckingham Today	37900	2010-01-01	2011-12-01
Bucks Free Press	6196	2012-01-01	2014-07-08
Bucks Herald	5101	2010-01-04	2013-06-27
Burnley Express	1119	2011-12-07	2012-07-03
Burnley Today	4692	2010-01-03	2011-12-07
Bury Free Press	3112	2011-11-25	2013-06-24
Bury St Edmunds Today	5253	2010-01-01	2011-12-15
Bury Times	4545	2010-01-01	2014-07-12
Buxton Advertiser	31293	2010-01-01	2012-07-03
Cambridge Evening News	7232	2010-01-01	2011-10-27
Cambridge News	2047	2011-10-27	2012-09-17
Cambs Times	9804	2010-01-01	2014-07-08
Chard and Ilminster News	9213	2010-01-01	2014-05-23
Cheshire Online	10284	2012-01-01	2013-06-27
Chester Evening Leader	2785	2010-01-04	2011-12-13
Chester First	1197	2011-12-06	2013-06-13
Chester Standard	3534	2010-01-03	2011-12-05
Chester Standard and Leader	1391	2011-12-12	2013-06-20
Chichester Observer	8224	2010-01-01	2012-07-05
Chingford Guardian	11802	2010-01-01	2014-08-25
Chorley Citizen	4880	2010-01-01	2014-07-07
Clitheroe Today	1719	2010-01-01	2011-02-16
Colchester Daily Gazette	14218	2012-01-01	2015-02-04
Cornish Guardian	16969	2010-12-15	2014-03-18
Country Life	1730	2010-01-04	2012-03-26
Coventry Telegraph	6842	2012-01-01	2013-06-27
Crawley Observer	7371	2010-01-01	2013-06-27
Croydon Guardian	13676	2010-01-01	2014-08-25
Cumberland and Westmorland Herald	1238	2010-01-04	2013-06-27
Daily Express	4220	2010-01-01	2013-02-06
Daily Post	16752	2012-01-01	2015-02-04
Daily Record	12067	2011-12-31	2012-07-31
Darlington and Stockton Times	12830	2011-12-29	2014-05-23
Derby Evening Telegraph	21616	2011-12-30	2013-08-31
Derbyshire Times	1455	2012-01-01	2012-07-04
Derry Journal	2680	2012-01-01	2013-06-22
Diss Mercury	1771	2012-01-01	2014-10-09
Doncaster Free Press	2260	2011-12-30	2012-07-02
Dorset Daily Echo	7353	2011-12-30	2014-04-02
Driffield Times and Post	1003	2011-12-29	2013-07-01
Dunmow Broadcast	1237	2012-04-03	2014-11-11
East Lothian Courier	2745	2011-07-15	2014-04-02
Eastern Daily Press	20077	2011-12-30	2014-07-08
Eastwood Advertiser	1254	2011-12-28	2013-06-30
Echo - Essex News and Sports	8099	2011-10-22	2014-08-25
Edgware and Mill Hill Times	3218	2012-01-02	2012-08-31
Ely Standard	3444	2012-01-02	2014-11-12
Epsom Guardian	5439	2010-02-09	2014-05-22
Essex Chronicle	6514	2012-01-01	2013-12-11
Eubusiness	6510	2012-01-01	2014-07-08
Evening Star (Ipswich)	10214	2012-01-01	2015-02-04
Express and Star	6866	2012-01-02	2015-02-04
Farmer's Weekly Special Reports	2449	2011-12-29	2012-08-30

Farmers Guardian	5873	2011-03-03	2015-02-04
Farmers Weekly Interactive	5914	2011-12-30	2014-07-04
Farming Uk	3382	2012-01-01	2014-12-11
Food Navigator	3395	2012-01-02	2015-02-04
Food Quality News	1612	2012-01-02	2015-02-03
Fruit Net (Uk and Germany)	1576	2012-01-03	2012-10-24
Gazette and Herald	7376	2012-01-03	2014-05-23
Gazette Live	12090	2010-04-10	2013-04-29
Glasgow Evening Times	4013	2011-12-30	2013-06-27
Grantham Today	3049	2012-01-01	2013-06-18
Grimsby Telegraph	3332	2012-01-01	2013-08-31
Guardian Local	2860	2010-03-26	2014-01-10
Guardian Series	5601	2011-12-31	2014-08-25
Hampshire Chronicle	3635	2012-01-01	2014-07-08
Harborough Mail	1639	2012-01-02	2013-08-01
Haringey Independent	2970	2012-01-01	2012-08-31
Harlow Citizen and Guardian	3006	2012-01-04	2014-08-25
Harrow Times	5262	2010-01-04	2014-07-08
Hartle Pool Mail	18306	2010-01-05	2013-05-21
Hemel Hempstead Today	3693	2012-01-01	2013-06-19
Hendon and Finchley, Barnet and Potters Bar, and Edgeware and Mills Hill Times	3115	2010-01-06	2014-05-23
Herald Scotland Breaking News	22100	2011-12-31	2015-02-04
Herts and Essex Observer	3302	2012-01-02	2014-07-08
Hexham Courant	1259	2012-01-02	2015-02-03
Highland News	1054	2012-01-02	2014-05-22
Horncastle News	1231	2010-07-07	2013-08-30
Horticulture Week	1281	2012-01-03	2012-10-23
Hucknall Dispatch	1712	2012-01-01	2013-08-31
Hull Daily Mail	18491	2012-01-02	2013-08-30
Hunts Post	2484	2011-12-30	2014-11-25
Ic Newcastle	1989	2011-12-27	2013-02-12
Ilford Recorder	2092	2010-01-01	2014-10-27
Ilkeston Advertiser	2619	2011-12-05	2013-08-31
Ilkley Gazette	2206	2012-01-01	2012-08-31
Impartial Reporter	1981	2011-12-29	2013-01-09
Insurance Insight	1565	2012-03-30	2013-12-09
International Business Times	8819	2012-01-01	2012-04-25
International Business Times Uk	37441	2012-04-24	2015-02-04
Isle of Wight County Press	5592	2012-01-01	2014-09-14
Journal Live	8775	2012-01-01	2013-06-27
Kenilworth Weekly News	1148	2012-01-01	2013-08-07
Kingston Guardian	5569	2010-02-09	2014-08-25
Lancashire Evening Post	12836	2011-12-27	2014-04-02
Lancashire Evening Telegraph	7987	2010-07-09	2014-05-03
Lancashire Telegraph	14232	2010-01-06	2014-07-08
Leamington Observer	1504	2012-11-23	2015-02-04
Leicester Mercury	19822	2012-01-01	2013-09-01
Leigh Journal	4266	2010-06-16	2014-08-25
Lincolnshire Echo	11841	2012-01-01	2013-12-17
Liverpool Echo	31745	2010-10-25	2013-03-11
Local London	13308	2010-05-09	2014-07-12
Louth Leader	2459	2011-12-05	2013-08-09

Lurgan Mail	3717	2010-02-18	2013-08-30
Luton News Herald and Post	1529	2012-01-01	2012-07-04
Lynn News	2400	2012-01-01	2012-07-04
Manchester Online	12576	2010-04-19	2013-01-23
Mansfield and Ashfield Chad	3631	2011-12-15	2015-01-27
Matlock Mercury	2387	2011-12-29	2013-08-30
Meat Info	2170	2012-01-03	2015-02-04
Melton Times	4016	2011-12-27	2013-12-13
Metro	14411	2012-01-01	2015-02-04
Morning Star	7287	2012-01-01	2013-06-30
Morning Star Online	1368	2013-05-23	2013-08-29
Morpeth Herald	2510	2012-01-01	2013-08-05
Newbury Today	5100	2010-01-12	2014-09-15
Newham Recorder	3799	2012-01-03	2014-10-27
News and Star	3229	2011-12-27	2013-07-31
News Guardian	1783	2012-01-02	2013-06-27
News Post Leader	4272	2010-01-04	2013-06-29
News Shopper	5921	2011-12-27	2014-07-08
Newsnet Scotland	5266	2011-07-22	2014-12-10
North Wales Chronicle	1821	2010-01-18	2014-09-15
North-West Evening Mail	5649	2011-12-31	2015-02-03
Northampton Chronicle and Echo	13018	2012-01-01	2015-02-04
Northamptonshire Evening Telegraph	2059	2012-01-01	2012-05-30
Northern Ireland Executive	5634	2012-01-11	2015-02-04
Northumberland Gazette	1781	2011-12-29	2013-08-04
Norwich Evening News 24	16705	2011-09-07	2015-02-04
Nottingham Post	23001	2012-01-01	2013-08-31
Open Democracy	1024	2011-01-28	2012-06-25
Ormskirk and Skelmersdale Advertiser	4601	2012-01-03	2014-03-26
Oxford Mail	47233	2012-01-01	2015-02-04
Paisley Daily Express	4608	2011-12-30	2012-12-18
Peterborough Evening Telegraph	10155	2011-12-30	2013-05-09
Petersfield Post	5331	2010-01-07	2014-01-24
Pink News	4564	2012-01-03	2013-08-30
Plymouth Herald	3350	2012-06-07	2013-08-31
Pr Newswire	4146	2011-12-30	2013-08-13
Reading Post	7965	2012-01-03	2015-02-03
Redhill and Reigate Life	2082	2012-01-01	2015-01-27
Retford Trader and Guardian	3688	2012-01-01	2013-08-31
Reuters Alertnet	19103	2010-01-01	2012-10-19
Richmond and Twickenham Times	3149	2011-12-31	2014-08-25
Ripley and Heanor News	2679	2011-12-30	2013-08-30
Royston Crow	3899	2012-01-03	2015-02-03
Rutland Times	6112	2011-12-08	2013-08-26
Rye and Battle Observer	1276	2011-12-30	2013-06-25
Saffron Walden Reporter	2870	2011-12-27	2014-11-11
Sale and Altrincham Messenger	3659	2012-01-01	2014-05-23
Scunthorpe Telegraph	9198	2012-01-01	2013-08-31
Sheffield Today	6284	2012-01-01	2012-07-04
Skynews	16526	2011-12-30	2014-05-23
Slough and South Bucks Observer	2514	2012-01-01	2013-06-30
Somerset County Gazette	5017	2012-01-01	2014-09-09
South Wales Evening Post	11987	2013-01-01	2015-02-04

Southern Daily Echo	41764	2010-01-01	2012-08-31
Southern Daily Echo - this is Hampshire	8250	2010-02-09	2014-09-12
Spalding Guardian	4331	2011-12-11	2013-06-20
Stamford Mercury	1585	2012-01-01	2012-07-04
Streatham Guardian	1317	2010-05-10	2012-02-21
Sunderland Echo	2900	2012-01-01	2012-07-03
Surrey Advertiser	4406	2010-01-05	2013-01-11
Sutton Guardian	4483	2012-01-01	2014-07-08
Telegraph Uk	5398	2011-12-30	2013-11-05
The Bath Chronicle	10460	2012-01-01	2013-09-02
The Berwickshire News	14351	2010-01-02	2013-06-27
The Courier and Advertiser	2646	2012-01-02	2012-12-11
The Cumberland News	15602	2010-01-01	2015-01-30
The Daily Mail	138438	2010-11-01	2014-05-23
The Daily Star	21226	2010-04-01	2013-07-01
The Daily Telegraph	284107	2010-01-01	2015-02-04
The Farmers Guardian	1726	2010-04-26	2012-10-03
The Guardian	9457	2011-12-28	2014-10-27
The Guardian Europe	17262	2012-05-09	2014-09-15
The Guardian Uk	2230	2011-07-19	2013-07-01
The Herald (Scotland)	15984	2012-02-05	2014-09-15
The Independent Uk	16763	2012-02-09	2013-06-30
The Northern Echo	8602	2011-12-31	2012-08-30
The Pig Site - Uk	1079	2011-12-29	2012-05-11
The Press (York)	14108	2010-01-04	2014-04-01
The Press and Journal	4970	2012-01-02	2014-05-21
The Reading Chronicle	4771	2012-01-01	2013-01-09
The Scotsman	25747	2012-02-08	2013-07-01
this is Cheshire	4804	2012-01-01	2014-09-04
this is Exeter	14939	2012-01-02	2013-08-30
this is Gloucestershire	28894	2011-12-31	2013-12-05
Times and Star	1553	2011-12-23	2015-02-03
Tyrone Times	3679	2012-04-11	2013-08-30
Uk Uncut on Twitter	2492	2012-01-04	2012-05-23
Waltham Forest Guardian	6406	2012-01-01	2014-08-25
Wandsworth Guardian	8654	2012-01-01	2012-08-31
Wanstead and Woodford Guardian	1099	2012-01-01	2012-08-28
West Sussex County Times	3426	2012-01-01	2013-06-10
Western Mail	6319	2011-04-08	2013-04-09
Wharf	3249	2012-01-03	2015-02-05
Wiltshire News / this is Wiltshire	16539	2012-01-02	2015-02-04
Wirral Globe	2466	2012-01-01	2014-08-25
Wisbech Standard	5109	2011-12-30	2014-11-19
Wokingham Times	5488	2010-01-26	2013-06-10
Worcester News	9961	2012-01-01	2014-07-08
Worksop Guardian	3851	2011-12-28	2013-08-23
World Nuclear News	1041	2012-01-03	2014-08-27
Worthing Herald	3096	2011-12-06	2015-02-04
Yorkshire Evening Post	19816	2011-08-23	2013-06-06
Yorkshire Post	1012	2013-01-15	2013-06-05