Does the Media Cover the Economy Accurately?

An Analysis of Sixteen Developed Democracies

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Abstract

Can voters learn what they need to learn to hold governments accountable for the economy through news coverage? Employing the first large-scale cross-national dataset of media coverage of the economy—over 2 million machine-coded articles related to three economic indicators in 32 mainstream newspapers, one left-wing and one right-wing, in 16 developed countries and six languages—we investigate media coverage of the economy that bears implications for electoral accountability and partisan advantage. We find that the tone of most mainstream newspapers tracks the economy faithfully, although the frequency of coverage increases with negative outcomes. While we find some evidence for partisan bias in tone for growth headlines and in frequency of coverage for unemployment articles, its substantive magnitude is diminutive. Mainstream newspaper coverage provides voters with largely accurate information.

1 Introduction

The economy influences election outcomes across a broad swath of countries, periods, institutions, and contexts (Powell and Whitten, 1993; Tucker, 2006). The state of the economy is perennially among the top, and is often the top, concern for voters (Heffington, Park and Williams, Forthcoming). While other predictors of individual vote choice are arguably as important, economic performance understandably captures a disproportionate share of scholarly and popular attention. Voters do not change their party identification quickly, nor do parties often shift major policy positions during a campaign. The economy, however, can and does continually change.

The preponderance of studies of the economic vote obtain their results by regressing election outcomes on economic aggregates (such as growth, unemployment, and inflation) or economic perceptions from surveys (Duch and Stevenson, 2008). How such perceptions arise, however, is less clear. Few voters learn about the state of the economy directly through these aggregates. Instead, voters may learn about the economy through direct experience (seeing their friend lose their job or seeing an abandoned retail location), through their social networks, or through media coverage. Indeed, some studies find that media coverage of the economy plays a more important role in forming economic perceptions than do objective economic conditions themselves (Sanders and Gavin, 2004). Media coverage in general and newspapers in particular provide a particularly important source of information to voters (Garz, 2013, 2018) and newspaper coverage is found to lead other sources of media (Roberts and McCombs, 1994).

Whether and to what degree the media accurately report the news has been a point of debate since the advent of organized free media. The media—to the degree that they influence perceptions about facts, set the public agenda, and drive political behavior—can have a profound effect on policy and the functioning of democracy. Recent research has

demonstrated a variety of substantial media effects on politics, opinion, and policy. Better informed citizens, be it from access to radio in the 1930s (Strömberg, 2004) or to newspapers that cover their Congressional representatives in the 1990s (Snyder and Strömberg, 2010), have been shown to receive better representation and more public spending. Independent media in Russia has been shown to influence voters to prefer opposition parties (Enikolopov, Petrova and Zhuravskaya, 2011). Endorsements by U.S. newspapers have been shown to influence which candidates voters support (Chiang and Knight, 2011).

Large media effects raise concern about inaccurate and biased reporting by amplifying its potential influence and distorting the economic vote. Inaccurate but unbiased reporting might imply that voters responding to media coverage of the economy hold their governments randomly accountable. Biased economic reporting, depending on the type of bias, could imply a systematic advantage for a political party or other group such as incumbents. The lower the accuracy and the higher the bias, in general, the weaker the electoral accountability for the economy and the greater the possibility of manipulation. Of course, such arguments pertain to all electorally relevant topics covered by the media but studying economic news offers one important advantage. Unlike most politically relevant topics, economic news relies on objective and frequently reported indicators against which media reports can be measured, providing exceptional leverage to assess accuracy and bias (Groeling, 2013).

This paper aims to be both broad and definitive where previous studies have offered only a patchwork of coverage. Not only do we analyze 32 newspapers—one left and one right—in 16 countries when previous research has been limited to only one country (the United States or the United Kingdom), but we also specifically track tone and frequency of economic reporting for growth, unemployment, and inflation where most previous research has only covered a single economic indicator. In essence we aim to provide the international stylized facts to serve a quickly developing field. What is the basic relationship between the economy and its mainstream media coverage in most developed democracies? Where and

how do given countries or periods deviate? Can voters learn what they need to learn to hold governments accountable for the economy through news coverage?

2   Accuracy and Bias in the Media

Consider the range of incentives that may prevent accurate reporting. Media outlets may pander to the the ideological leanings of their readers (Gasper, 2009; Gentzkow and Shapiro, 2010; Chiang and Knight, 2011). Gentzkow and Shapiro (2011) demonstrate that there is considerable variation in the ideological leanings of consumers of particular media outlets and Gentzkow and Shapiro (2010) argue that the ideological locations of newspapers are similar to their profit maximizing positions. Media outlets may be influenced by the ideology of their owners and management.[1] The ideology of journalists may influence reporting as well— Patterson and Donsbach (1996) present survey evidence suggesting that in five countries, the average journalist identifies as somewhat liberal. Journalists however, may subscribe to a norm of objectivity (Schudson, 2011) and therefore will at least strive for fair or accurate reporting. Moreover, the technical aspects of writing may limit the ability of journalists to exert overt bias in some contexts.

Media coverage may also differ from objective standards for reasons other than ideological bias—reporters respond most to initial economic reports from governmental agencies and neglect the more accurate later revisions (Croushore and Stark, 2003). Hetherington (1996) argued that revised economic figures vindicated George H.W. Bush's claim during his 1992 re-election campaign that the economy was in fact much stronger than the media was reporting.

Much of the popular and scholarly press share an implied consensus that the media exerts considerable influence over public opinion, politics, and policy. Disagreement arises,

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[1]Gentzkow and Shapiro (2010) argue that little of the variation in newspaper ideology is explained by ownership.

however, over what these effects are and how they arise. Simple exposure to media of any sort may influence information levels and political behavior independent of media bias. News coverage can be inaccurate and biased in both tone and topic. Moreover, the bias in tone and topic may be ideological/partisan in nature or may overemphasize positive or negative events independent of the identity of the governing parties.

Setting the question of bias aside, media coverage—both tone and frequency—has been shown to alter the perceptions and behavior of news consumers. Negative economic reporting has been associated with declines in multiple subjective economic measures including consumer confidence (De Boef and Kellstedt, 2004; Hollanders and Vliegenthart, 2011), expectations about changes in the national economic condition (Goidel et al., 2010; Boomgaarden et al., 2011; Garz, 2013, 2018), and personal financial expectations (Goidel et al., 2010), although other research has questioned the causal direction (Hopkins, Kim and Kim, 2017; Wlezien, Soroka and Stecula, 2017).

Scholars have also associated the partisan orientation of media outlets with political perceptions and behavior, albeit not without dispute. Ladd and Lenz (2009) demonstrate a remarkably large effect on voting behavior (between 10 and 25% of readers switching to Labour) from newspapers that switched their endorsement to Labour prior to the 1997 British election. Exposure to Fox News in U.S. congressional districts increased vote shares for Republican candidates (DellaVigna and Kaplan, 2007), likely by motivating and reinforcing the loyalties of Republican co-partisans (Hopkins and Ladd, 2014), and caused both Democrats and Republican representatives in the U.S. Congress to adopt more conservative positions (Arceneaux et al., 2016). Not all research has found partisan effects, however—a carefully designed field experiment by Gerber, Karlan and Bergan (2009) found that neither participants who received a treatment of a free subscription to the left-of-center *Washington Post* nor those who received the right-of-center *Washington Times* demonstrated a change in political knowledge, stated opinions, or election turnout in the 2005 Virginia gubernato-

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rial election, although receiving *either* paper led to increased support for the Democratic candidate. Kern and Hainmueller (2009) found that West German television did not lead to decreased support for the East German governing regime.

Media effects in general and partisan media effects in particular likely arise from how media outlets cover events. Negativity bias pertains to the assertion that either the tone of articles covering negative economic developments is more extreme or that simply more articles are published about negative than positive economic events. While non-partisan, the potential consequences of more negative coverage of the economy is substantial. Negativity bias in economic news, together with individuals' tendency to react more strongly to negative news (Kahneman and Tversky, 2000), at least partly explain the asymmetric magnitude of voter responses to good and bad economies (Bloom and Price, 1975) and, given the accumulation of bad (economic) news over time, the deterioration of government popularity over time (Paldam and Skott, 1995). Already in the 1990s, Blood and Phillips (1995) observed a negative correlation between presidential approval and the number of recession headlines in the United States. If approval scores are driven by the economy, the tendency of governmental popularity to decline over time may be an artifact of negativity bias. Goidel and Langley (1995) more directly demonstrated that the media report more on negative than positive economic conditions. More recently, Stuart Soroka has provided some of the strongest evidence to date that positive, relative to negative, economic developments yield less news coverage in mainstream newspapers (Soroka, 2006, 2012), with Garz (2014) finding similar results for television coverage.

In contrast to negativity bias, partisan media bias has generated a large scholarly literature with considerable disagreement about its existence and form (D'Alessio and Allen, 2000; Puglisi and Snyder, 2015). A number of studies have compared the terminology used by media outlets to the terminology used by Democratic or Republican members of Congress. Groseclose and Milyo (2005) argue that most media outlets use terminology

similar to Democratic legislators while Gentzkow and Shapiro (2010) argue that that market incentives push newspapers to slant their terminology toward the preferences of their consumers. Ansolabehere, Lessem and Snyder (2006) argue that in the past, newspaper endorsements largely favored Republican candidates while more recently, newspapers slightly favor Democratic candidates. Puglisi and Snyder (2014) leveraged ballot propositions and found that the average newspaper was very close to the position of the state's median voter. Collectively, this literature has found significant differences in the ideological locations of media outlets, but with most studies finding rough partisan symmetry.

Most research on ideological bias in tone has compared reporting to partisan symmetry rather than to an objective benchmark. An exception is Lott and Hassett (2014), who compare media tone in coverage of actual economic events and find that U.S. newspapers headlines, with the notable exception of presidents' home-state newspapers, are more critical of the economy when Republicans are in power. In contrast, a recent paper by Boydstun, Highton and Linn (Forthcoming) finds that media tone in four US newspapers tracks economic performance fairly accurately. A second type of ideological bias does not require differences in tone. It is possible that left-leaning and right-leaning newspapers accurately report on the economy with a neutral tone but simply do so more often when it benefits co-partisans. Larcinese, Puglisi and Snyder (2011) find precisely such a pattern—the authors demonstrate that left-leaning newspapers report more frequently than their right-leaning counterparts on negative economic news (most strongly, unemployment) when a Republican holds the presidency. Puglisi (2011) argues that the New York Times places more emphasis on issues that are owned by the Democratic party in the run up to a presidential election.

In summary, previous research has shown (1) that economic news affects the perceptions and behavior of news consumers, (2) that partisan news—not only about the economy—can have large effects on political preferences and voting behavior and (3) that negative news gets covered more frequently than positive news. Partisan bias is quite apparent in some

cable news channels and news websites but considerably less consensus exists about whether partisan bias exists in mainstream newspapers that play a critical role in the broader media agenda. Moreover, the studies on partisan bias that have been done have focused on only a single country and, with a few exceptions, have lacked an objective measure against which to measure bias. When they have had an objective benchmark—various economic indicators—they have only examined tone or frequency, not both. In contrast, we assemble and analyze an international sample of full-length articles on a previously unattained scale: over 2 million articles related to the economy from 32 newspapers in 16 developed countries for all years available. Two newspapers, one left-wing and one right-wing, are included from each country. We employ human-validated automated analysis of the full text of each article, measuring the both the tone and the frequency of three economic measures—economic growth, unemployment, and inflation. This allows us to link our measure of tone to particular economic aggregates and leads to an objective benchmark against which accurate and fair reporting can be judged.

We find that most newspapers report rather accurately on the economy—newspaper tone on growth, unemployment, and inflation track growth, changes in unemployment, and changes in inflation with considerable fidelity. Only small differences in tone emerge between papers of the right and left and mostly do not persist. Most papers, however, regardless of their ideological position report more frequently on negative economic outcomes, confirming the existence of negativity bias. While we do not observe substantial differences in tone between right and left newspapers as a function of which party is in power, we do find that unemployment receives less coverage by newspapers that ideologically match the governing party when unemployment is high (we do not find analogous results for growth and inflation). In other words, both negativity and (unemployment-oriented) ideological bias emerge across many developed democracies in the frequency of reporting but not in the tone. Overall, our results imply that in one area where an objective benchmark is available and which is of

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considerable importance, media coverage provides readers with largely accurate information, with the exception being that negative information is over-emphasized. Our results also confirm a pathway through which voters can learn what they need to learn to hold incumbent governments accountable for economic performance.

3 The Data

3.1 Newspaper Articles

As our motivation is to study the mechanisms behind the economic vote, we began with a list of 24 OECD countries which are typically included in studies of the economic vote. Our goal was to obtain a time-series of newspaper sentiment as long as possible, for both a left-wing and right-wing paper, for as many developed democracies as possible. One limitation is the many languages that are spoken among these countries. We focused our analysis on three languages which were spoken in many of the OECD countries—English, French, and German. We were able to include Spanish, Portuguese, and Italian newspapers as well because our research assistant who spoke French also happened to speak these languages. Using these six languages combined, we were able to include 16 of the OECD countries is our sample.[2] The longest window of coverage starts in 1977 (*The Globe and Mail*) and the shortest in 2012 (*Correio da Manha*). Coverage for all newspapers are detailed in Table 1.

In each country, we attempted to identify a relatively left-wing and relatively right-wing newspaper for which we could obtain electronic copies of articles. Our preference was for newspapers that had a large circulation, were mainstream rather than ideologically extreme or tabloid, and had a long time series of articles available. When a mainstream left-wing or

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[2]These countries include Australia, Austria, Canada, France, Germany, Ireland, Israel, Italy, Japan, Luxembourg, New Zealand, Portugal, Spain, Switzerland, the United Kingdom, and the United States.

Country	Newspaper	Language	Relative Partisanship	Coverage
Austria	*Der Standard*	German	Left	Dec. 2007 – Aug. 2013
Austria	*Die Presse*	German	Right	Apr. 2004 – Aug. 2013
Australia	*The Age*	English	Left	Jan. 1991 – Sept. 2013
Australia	*The Herald Sun*	English	Right	Jan. 1987 – Aug. 2013
Canada	*Toronto Star*	English	Left	Sept. 1985 – Aug. 2013
Canada	*The Globe and Mail*	English	Right	Nov. 1977 – July 2013
France	*Le Monde*	French	Left	Jan. 1990 – Dec. 2012
France	*Le Figaro*	French	Right	Jan. 1997 – Aug. 2013
Germany	*Die Zeit*	German	Left	Nov. 2008 – Apr. 2014
Germany	*Frankfurter Allgemeine*	German	Right	Jan. 2010 – Sept. 2013
Ireland	*The Irish Times*	English	Left	Jun. 1992 – Dec. 2012
Ireland	*The Irish Independent*	English	Right	Oct. 2006 – Aug. 2013
Israel	*Globes*	English	Left	June 1996 – Sept. 2013
Israel	*The Jerusalem Post*	English	Right	Jan. 1989 – Aug. 2013
Italy	*La Stampa*	Italian	Left	Jan. 1992 – Dec. 2012
Italy	*Corriere della Serra*	Italian	Right	Jan. 2009 – Aug. 2013
Japan	*Nikkei Weekly*	English	Left	June 1980 – Sept. 2013
Japan	*Daily Yomiuri*	English	Right	Sept. 1989 – Mar. 2013
Luxembourg	*Le Quotidien*	French	Left	Apr. 2008 – Dec. 2013
Luxembourg	*Le Fax d'Agefi*	French	Right	Dec. 2009 – Apr. 2014
New Zealand	*The Press*	English	Left	June 1996 – Aug. 2013
New Zealand	*New Zealand Herald*	English	Right	Nov. 1998 – Aug. 2013
Portugal	*Correio da Manha*	Portugese	Left	June 2012 – Aug. 2013
Portugal	*Jornal de Noticias*	Portugese	Right	July 1997 – June 2013
Spain	*El Pais*	Spanish	Left	Apr. 1996 – Dec. 2012
Spain	*El Mundo*	Spanish	Right	July 2002 – Aug. 2013
Switzerland	*Tages-Anzeiger*	German	Left	Sept. 1997 – Sept. 2013
Switzerland	*Neue Zürcher Zeitung*	German	Right	May 1993 – Dec. 2012
United Kingdom	*The Guardian*	English	Left	July 1984 – July 2013
United Kingdom	*The Times (London)*	English	Right	Jul. 1985 – Dec. 2012
United States	*New York Times*	English	Left	Sept. 1989 – Sept. 2013
United States	*Wall Street Journal*	English	Right	June 1979 – Dec. 2013

Table 1: *Dates of Coverage for 32 Newspapers.*

right-wing paper was not available, we collected a relatively more extreme left-wing or right-wing newspaper. If either a left-wing or right-wing paper was not available, we collected a centrist paper. We coded the ideology of newspapers on a -2 to 2 scale, with -2 being extreme-left, -1 being left, 0 being centrist, 1 being right, and 2 being extreme right, based on a number of web-sources.

Our dataset consists of over 2 million articles from 32 newspapers. Our sample represents a large increase in coverage over previous studies, in the number of newspapers, the number of countries, and the number of articles. Most previous studies have relied on human labor to categorize articles, which necessarily limited them to small samples (one or two newspapers) usually from a single country. We employed automated coding which enabled the analysis of text on a scale not possible with human coding. Prominent human-coded studies, for comparison (such as Soroka, 2006) were able to categorize thousands of articles.

Automated content analysis also enabled a smaller unit of analysis. Rather than classifying individual economic articles as positive or negative, we used text fragments as the basis of our sentiment analysis. This approach enabled us to capture more nuance than is possible with the discrete categorizing of economic articles as positive or negative. The actual unit of analysis was aggregated up to the month—the proportion of positive (or negative) economic text fragments in a given month—in order to match the economic data.

Why newspapers? Indeed, news content is fragmented over a variety of media in addition to newspapers, for example, television, twitter, social networks, online news portals, blogs, and other sources. Two reasons guide our decision to focus on newspapers. First, newspapers offer the longest coverage available to researchers. Television transcripts start later and social media, such as twitter, even later. Second, the content of television news coverage differs little from newspaper coverage (Druckman, 2005) while newspaper reporting tends to lead other news media (Roberts and McCombs, 1994).

3.2 Economic Indicators

Our two sources of economic data were the Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF). We used the highest frequency data that was available. If monthly data were available (as was sometimes the case for unemployment and inflation) we used monthly data. If only quarterly data were available, we converted the quarterly data to monthly data as follows: for growth we assumed a constant rate of growth throughout the time period; for unemployment, we assumed a constant unemployment rate throughout the time period; and for inflation, we assumed a constant rate of inflation throughout the time period. When quarterly data were not available, we interpolated the quarterly data based on annual data and we then interpolated the monthly data based on the quarterly data. We used the highest frequency available preferentially, we used harmonized data (for unemployment and inflation) preferentially over unharmonized data, and we used the OECD data preferentially over the IMF data.

Once the data were converted to monthly values, we could then aggregate them to various other time periods so that we could run separate analyses on monthly, quarterly, and annual data. Consider, for example, a newspaper article published in February of 2003. The newspaper's coverage may reflect unemployment in the current month, the current quarter, the current year, etc. Ideally, quarterly unemployment figures for an event that occurred in February should be computed as the average unemployment in February and the previous two months rather than the average for January, February and March reported in standard quarterly economic data. While it may seem redundant to compute the monthly data based on quarterly data only to covert the monthly data back to quarterly (and yearly) data, the converting allows us to interpolate appropriate economic indicators for all months, not only those at the end of a quarter or year.

4 Methodology

Our starting point was studies of the economic vote and, specifically, three important aspects of the economy—growth, unemployment, and inflation. Our goal was to code sentiment for corresponding categories in newspaper coverage. We sought to consider the impressions that an average voter would receive about the economy upon reading the average newspaper article covering the economy, based on the assumption that voters form their impressions of the economy from newspapers as well as from other sources. Voters as a group determine the electoral fortunes of incumbent parties. What matters then is the impression that voters as a group would obtain from reading newspaper coverage of the economy. This definition acknowledges that there may be some measurement error if a single human coder would rate media sentiment because our definition of sentiment is the impression that an average voter would have. It also acknowledges that different voters may read different articles, and potentially different newspapers.

We first pared the set of articles down to a more reasonable size. We used keyword searches to identify articles that were related to the economy. This involved analyzing approximately 5% of the articles from each newspaper reducing the number of articles we were required to collect from around 40 million to around 2 million. From these articles, we sought to code the amount of coverage devoted to the economy in general, growth, unemployment, and inflation over time. We also sought to code monthly sentiment as positive or negative along the four possible dimensions—the economy in general, growth, unemployment, and inflation.

4.1 Coding of Sentiment

We applied a dictionary-based approach for coding sentiment (De Boef and Kellstedt, 2004; Soroka, Stecula and Wlezien, 2014). Consider the following simplified version of a dictionary-

based approach. We identify a number of words which denote growth. We also identify a number of words which denote positive and negative sentiment. We then code sentiment based on the relative frequency of positive and negative words near growth words (where we could use 4 words away as our definition as "near").

The actual approach we used is somewhat more involved. We used a separate dictionary of negations and a nearby negation was assumed to alter the meaning of a positive or negative word. We used a dictionary of words indicating increasing and decreasing where increasing words near growth contributed to positive sentiment and decreasing words near growth contributed to negative sentiment. We used a separate list of words indicating a recession, which were coded as negative sentiment. All together, we calculated the number of positive growth instances divided by positive plus negative growth instances in a given month to generate our measure of sentiment for that newspaper in that month. Similar rules were used to generate sentiment for unemployment, inflation, and the economy in general. Measures of the amount of coverage for the economy in general, growth, unemployment, and inflation used the same dictionaries.

To develop our English dictionaries, we made small modifications to existing dictionaries, most often to tailor them to economic topics. The dictionaries in all six languages used the base dictionaries available in WordStat as a starting point (Péladeau, 1998). The dictionaries were all customized by fluent speakers and one research assistant who was fluent in five of the languages was able to ensure that they were highly similar. In Appendix A.2, we provide evidence for the validity of our measure comparing it to human coding.

5   Accuracy of Newspaper Coverage of the Economy

5.1   The Tone of Coverage

Does newspaper sentiment reflect the economy? We first consider the correlation between our measure of newspaper sentiment on growth, unemployment, and inflation, and our economic aggregates. We measure sentiment at the monthly level, but newspaper sentiment may not necessarily reflect only the performance of the economy over the last month. For this reason, we compare monthly newspaper sentiment to economic performance over the most current month, quarter, semi-year, year, two-year period, and four-year period. In addition, we consider both levels and changes in unemployment and inflation. The correlations are presented in Table 2.

We see that same-month economic statistics associate less strongly with monthly newspaper sentiment than longer-period economic measures. Growth in the year up to a given month is most strongly related to growth sentiment in that month. The change in unemployment over the prior six months correlates most strongly with unemployment sentiment in a given month and the change in the inflation rate over the prior 12-months associate most strongly with inflation sentiment. The results suggest that media sentiment is partially driven by the economy, but rather than reflecting the immediate state of the economy, it reflects the change in the economy over the period of about a year.

The results also suggest that growth sentiment may be more highly related to growth than unemployment and inflation sentiment are related to changes in unemployment and changes in inflation. However, this may be partially due to measurement error. We use the fact that we have multiple measures of media sentiment in each country at each point in time to adjust for measurement error. The results, presented in the second row for each economic indicator in Table 2, continue to show that media sentiment reflects the change in the economy of the period of about a year. The correlations between sentiment and the

economy appear stronger after correcting for measurement error, however growth sentiment remains more closely related to actual growth than the other measures of sentiment are to their respective economic indicators.

	Month	Quarter	Semi-year	Year	2 Years	4 Years	N
Growth Sentiment							
Growth	0.37	0.43	0.49	**0.51**	0.48	0.37	6647
error corrected	0.43	0.49	0.56	**0.59**	0.56	0.45	5136
Unemployment Sentiment							
Unemployment	0.01	0.02	0.04	0.07	0.11	0.15	6599
error corrected	0.00	0.02	0.04	0.09	0.17	0.22	5128
Change in Unemployment	-0.18	-0.31	**-0.33**	-0.27	-0.12	-0.04	6599
error corrected	-0.28	-0.49	**-0.51**	-0.39	-0.11	-0.01	5128
Inflation Sentiment							
Inflation	-0.07	-0.09	-0.06	-0.01	0.05	0.09	6592
error corrected	-0.16	-0.21	-0.17	-0.07	0.09	0.19	5036
Change in Inflation	0.01	-0.07	-0.10	**-0.16**	-0.11	-0.05	6592
error corrected	-0.02	-0.12	-0.18	**-0.30**	-0.20	-0.25	5036

Table 2: *Correlations between Sentiment and the Economy. The largest correlation for each measure of economy is highlighted in bold. The second row for each economic indicator reports the correlations corrected for measurement error.*

In Table 3, we use four types of monthly positive economic sentiment as our dependent variables and we use our yearly measures of growth, change in unemployment, and change in inflation as independent variables (our specification was motivated by the results of Table 2). We include newspaper fixed effects to account for differences in the way language is used by different newspapers and cluster the standard errors by newspaper to account for correlations in the error term within each newspaper. Considering overall economic sentiment, we find the expected relationships with all three economic indicators: growth exhibits a positive effect and unemployment and inflation exhibit a negative effect, although the latter is not statistically significant. How well do growth, changes in unemployment, and changes in inflation predict their respective sentiment measures (i.e., tone)? Quite well and with the correct signs, it turns out—although unemployment change has a smaller effect than growth and inflation change smaller than both others.

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Dependent Variable:	Economic Sentiment (articles)	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)
Independent Variables:				
Constant	0.463***	0.433***	0.513***	0.510***
	(0.008)	(0.012)	(0.005)	(0.004)
Growth (yearly)	0.014***	0.024***	0.011***	-0.003*
(SD = 3.073)	(0.002)	(0.004)	(0.002)	(0.001)
Change in Unem. (yearly)	-0.008	-0.022*	-0.014***	0.007**
(SD = 0.921)	(0.005)	(0.009)	(0.003)	(0.003)
Change in Inf. (yearly)	-0.003*	-0.004+	0.002	-0.008***
(SD = 4.823)	(0.001)	(0.002)	(0.001)	(0.002)
Predicted Values:				
2nd Percentile	0.349	0.257	0.433	0.427
One S.D. Worse than Mean	0.430	0.400	0.487	0.442
At Mean	0.496	0.511	0.524	0.464
One S.D. Improv. over Mean	0.561	0.623	0.561	0.485
98th Percentile	0.638	0.752	0.605	0.506
Number of Months	6648	6647	6638	6581
Number of Newspapers	32	32	32	32
Number of Countries	16	16	16	16
R-Squared	0.468	0.482	0.300	0.249

Table 3: *The Effect of the Economy on Newspaper Sentiment — Newspaper fixed effects were included in each regression, but omitted from the table. Standard errors clustered by newspaper in parentheses.* $^+p < .10,$ $^*p < .05,$ $^{**}p < .01,$ $^{***}p < .001.$

To get a sense of the size of the effects, Table 3 also reports predicted values varying growth, changes in unemployment, and changes in inflation. Improving all three measures of the economy by one standard deviation would improve economic sentiment by 6.5 percentage points.[3] Applying the same change to growth sentiment, unemployment sentiment, and inflation sentiment would improve these by 11.2, 4.3, and 2.1 percentage points respectively. Growth sentiment appears to be more sensitive to changes in the economy than unemployment and inflation sentiment. Considering improving each measure of the economy from the 2nd percentile to the 98th percentile would lead overall economic sentiment to improve by 28.9 percentage points. The same effect for growth sentiment is almost 50 percentage points,

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[3]$6.5 = (.561 - .496) * 100$

with much smaller effects for unemployment and inflation sentiment. A similar pattern holds for the R-squares for the 3 regressions—the economy provides more explanatory power for growth sentiment than the other sentiment measures.

We also consider the degree to which the newspapers are neutral in their coverage. As a benchmark for neutrality, we can compare the predicted sentiment measure during an average economy to 0.5 (which would indicate that positive words are used with the same frequency as negative words). These results are also provided in Table 3, in the row reporting means. Overall economic sentiment is very close to this benchmark, with the predicted value estimated at 0.496. Due to our large sample size, we find that this value is statistically distinguishable from 0.5, but we interpret this result as suggesting that newspapers are on average neutral in their coverage. Section 6 considers the issue of neutrality further by considering ideological bias in newspaper sentiment and coverage.

5.2   The Frequency of Coverage (Negativity Bias)

We next investigate which aspect of economic performance—growth, unemployment, or inflation—receives the most newspaper coverage. In our data, the average share of economy-related sentence fragments (averaged over months) devoted to growth, unemployment, and inflation, are 44.8%, 18.8%, and 36.3%, respectively. We compare the correlations of the share of coverage of each to our measures of economic performance. As before, we consider different windows for our calculation of economic performance. The results can be seen in Table 4.

Consistent with findings of negativity bias (e.g., Soroka, 2006), we find that newspapers are more likely to cover growth, unemployment, and inflation, when economic performance according to these measures is poor. Moreover, we find that coverage responds more strongly to levels rather an changes in unemployment and inflation (an interesting difference from our findings for sentiment). In terms of the time window, annual measures offer the best option.

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	Month	Quarter	Semi-year	Year	2 Years	4 Years	N
Growth Share of Coverage							
Growth	-0.24	-0.27	-0.32	-0.36	**-0.38**	-0.34	6648
Unemployment Share of Coverage							
Unemployment	0.39	0.39	0.39	**0.39**	0.39	0.38	6609
Change in Unemployment	-0.01	0.00	0.06	0.11	0.15	0.17	6609
Inflation Share of Coverage							
Inflation	0.15	0.21	**0.26**	0.25	0.23	0.20	6660
Change in Inflation	0.01	0.01	0.08	0.09	0.05	0.00	6660

Table 4: *Correlations between Share of Coverage and the Economy — Largest correlation for each measure of economy is highlighted in bold.*

Dependent Variable:	Economic Coverage (articles)	Growth Share of Coverage (articles)	Unemployment Share of Coverage (articles)	Inflation Share of Coverage (articles)
Independent Variables:				
Growth (yearly)	-0.022***	-0.016***		
	(0.006)	(0.002)		
Unemployment (yearly)	0.002		0.012***	
	(0.005)		(0.002)	
Inflation (yearly)	-0.008			0.008**
	(0.007)			(0.003)
Number of Months	6136	6648	6656	6660
Number of Newspapers	32	32	32	32
Number of Countries	16	16	16	16
R-Squared	0.775	0.640	0.630	0.698

Table 5: *The Effect of the Economy on Newspaper Coverage — Newspaper fixed effects were included in each equation, but omitted from the table. Standard errors clustered by newspaper in parentheses. $^{+}p < .10, ^{*}p < .05, ^{**}p < .01, ^{***}p < .001.*$

We consider additional results in Table 5. In the first column, the dependent variable is the share of sentence fragments that mention the economy.[4] We find that newspapers focus more heavily on the economy when growth is low (the effects for unemployment and inflation are not statistically significant). In the last three columns of the table, the dependent variable is the share of coverage of growth, unemployment, and inflation.[5] We again find evidence of negativity bias, i.e., that for each economic measure, the media pay more attention when the economy is performing poorly according to that measure. It is striking how high the R-squares are—a single measure of the economy plus newspaper fixed effects predict over 78% of the squared variation. Moreover, the effect sizes are quite large—improving each measure of the economy from the 2nd percentile to the 98th percentile leads to about a 20 percentage point decrease in the amount of coverage.

In summary, bad economic news gets covered more than good and primarily when it is about economic growth. That the frequency of articles on the economy increases as the state of the economy (growth) declines is reassuring from the perspective of electoral accountability, as greater coverage may be associated with greater salience for voters. No less interestingly, this finding of negativity bias in coverage suggests a possible mechanism for the empirical regularity that governments, on a average, lose popularity over time (Paldam, 1986).

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[4]The denominator is the number of words across all articles that the newspaper published in that month, including the articles not identified as potentially economic articles by our keyword search. We are able to estimate the total number of words because we collected the total number of articles and we assume that the articles in our sample are the same length as the articles not in our sample.

[5]The denominator is the number of economic words across all articles that the newspaper published in that month.

6 Ideological Bias in Newspaper Coverage of the Economy

6.1 The Tone of Coverage

In the previous section, we found that the tone of media coverage reflected the economy—newspaper sentiment on growth, unemployment, and inflation, were to a large degree explained by growth, unemployment, and inflation. The fact that sentiment does not perfectly track these economic aggregates leaves open the possibility the newspapers differ in their reporting of the economy. In this section, we focus on ideological differences. Specifically, we focus on whether right-wing (left-wing) newspapers report more positive sentiment when there is a right-wing (left-wing) government. Previous research, as discussed above, has come to mixed conclusions over whether the (US) mainstream media exhibits ideological/partisan bias—an outcome that would have important consequences for democratic accountability and representation. We expand the scope of this question beyond the United States and at the same time focus on a more tractable variant of the question by examining reporting on a more objective matter, the economy.

Our main analysis focuses on the relative left/right coding of newspapers we previously reported. We coded the left/right ideology of the incumbent prime-minister's party based on the Comparative Manifesto Project party ideology scores. We then coded the variable *Ideological Match* as 1 for observations where the newspaper and the prime-minister had the same ideological orientation and 0 otherwise.

In Table 6, we find that in most countries, economic sentiment of the left-wing and right-wing papers is highly correlated. The correlation between the left-wing and right-wing papers only falls below 50% for Luxembourg and Portugal, which both feature a very short time series. Still, it may be possible that left and right wing papers exhibit some ideological

differences. We expand on this in Figure 1, where we report the time series of economic sentiment for left-wing and right-wing papers along with whether a left-wing or right-wing party control the government. The results here suggest that left and right newspapers track each other closely and that the differences are not well explained by shifts in the partisan control of government (indicated by the colored background segments).

Country	Correlation	N
Australia	0.80	212
Austria	0.63	69
Canada	0.84	335
France	0.79	192
Germany	0.54	45
Ireland	0.76	75
Israel	0.58	203
Italy	0.84	48
Japan	0.55	283
Luxembourg	0.31	30
New Zealand	0.65	178
Portugal	0.42	13
Spain	0.86	126
Switzerland	0.77	150
United Kingdom	0.85	326
United States	0.86	286

Table 6: *Correlation between Sentiment in Left-wing and Right-wing Papers.*

To test the hypothesis of ideological bias in tone more formally, we consider models with sentiment as the dependent variable and the economy, whether the paper is ideologically matched with the current government, and interactions between these as independent variables.[6] We consider outcomes where (a) the ideological variables are jointly significant and (b) sentiment is higher for ideologically matched papers for all values of the economy as evidence in favor of ideological bias. The first three columns of Table 7 show that the ideological match variables are neither individually nor jointly statistically significant, suggesting that there no evidence of ideological bias in tone.

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[6]The specifications used were motivated by the findings in Tables 2 and 3, where we found that changes in unemployment and inflation affected unemployment and inflation sentiment and where we found that growth affected unemployment and inflation sentiment.
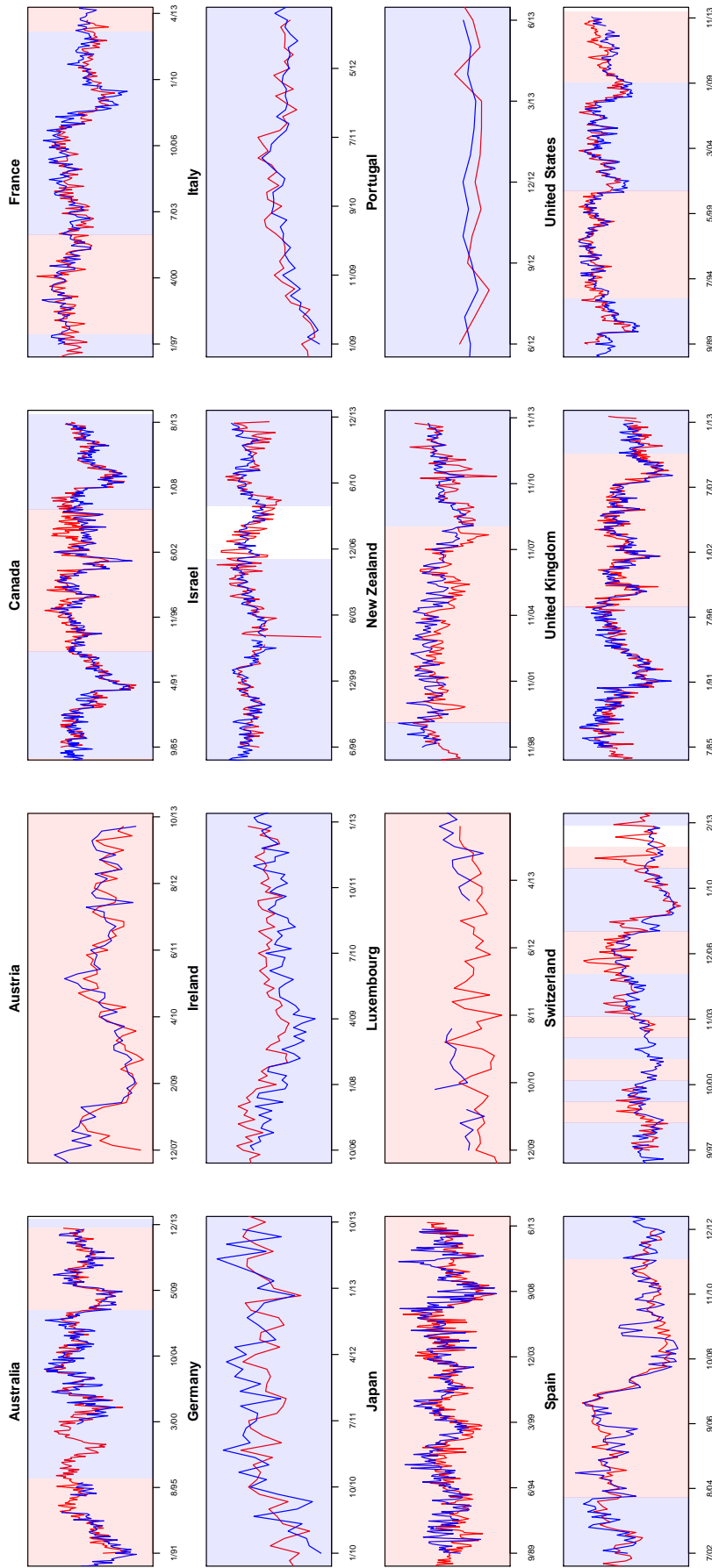
Figure 1: *Comparing Left-wing and Right-wing Sentiment — The figure reports the proportion of positive reports on the economy in left-wing (red) and right-wing (blue) newspapers over time. Red highlighting indicates a left-wing government and blue highlighting indicates a right-wing government.*

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Dependent Variable:	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)	Growth Sentiment (headlines)	Unemployment Sentiment (headlines)	Inflation Sentiment (headlines)
Independent Variables:						
Growth (yearly)	0.027***	0.010***	-0.003*	0.033***	0.017**	-0.007**
	(0.005)	(0.002)	(0.001)	(0.006)	(0.006)	(0.002)
Change in Unemployment (yearly)		-0.013**			-0.011	
		(0.005)			(0.009)	
Change in Inflation (yearly)			-0.010***			-0.013**
			(0.002)			(0.004)
Ideological Match	-0.001	-0.002	0.003	0.016	0.007	-0.005
	(0.019)	(0.009)	(0.007)	(0.018)	(0.021)	(0.014)
Growth * Ideo. Match	0.003	0.002	-0.003	0.002	0.002	0.004
	(0.006)	(0.003)	(0.002)	(0.007)	(0.007)	(0.003)
Change in Unem. * Ideo. Match		-0.004			0.004	
		(0.006)			(0.011)	
Change in Inf. * Ideo. Match			0.003			0.003
			(0.003)			(0.004)
p-Value from Wald Test:						
Ideo. = Ideo. * Growth = 0	0.826			0.066+		
Ideo. = Ideo. * Unem. = 0		0.835			0.783	
Ideo. = Ideo. * Inf. = 0			0.280			0.647
Number of Months	6512	6504	6448	5959	5243	5564
Number of Newspapers	32	32	32	31	31	31
Number of Countries	16	16	16	16	16	16
R-Squared	0.462	0.302	0.244	0.171	0.063	0.055

Table 7: *Media Bias in Sentiment — Newspaper fixed effects were included in the analysis, but omitted from the table. Standard errors clustered by newspaper in parentheses. In all cases, the null hypothesis in the Wald test is that Ideological Match and its interactions with the economy are jointly zero.* $^{+}p < .10, ^{*}p < .05, ^{**}p < .01, ^{***}p < .001.$
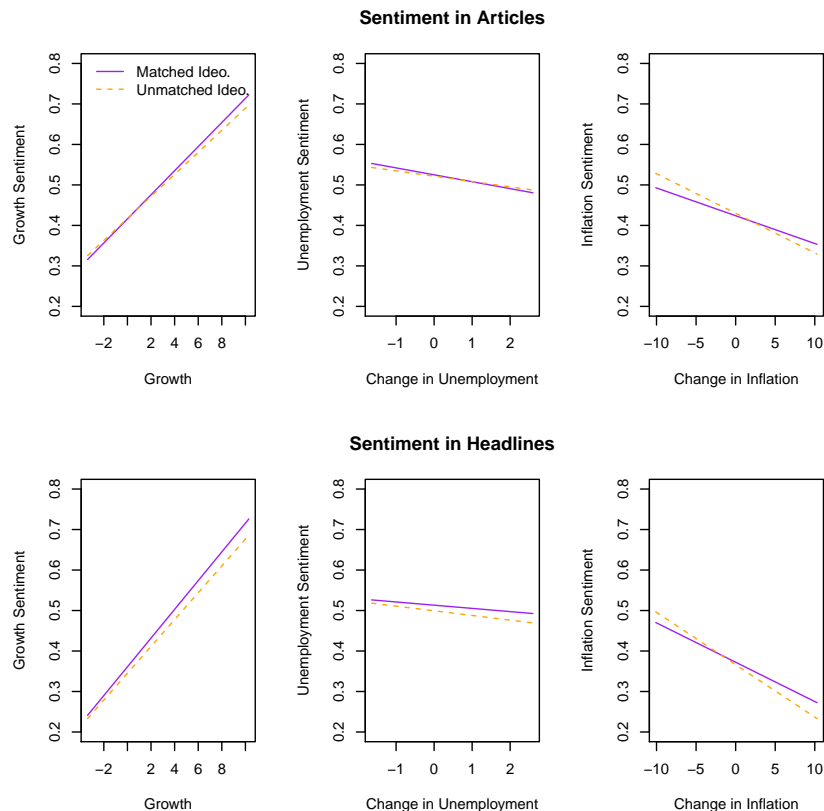
Figure 2: *Sentiment vs. the Economy for Ideologically Matched and Unmatched Newspapers — Results are calculated based on Table 7*

It is possible that newspapers may bias their reporting on the economy in a more narrow sense. In particular, if readers glance at many articles, but only read some, headlines have the potential to exert more influence on voter sentiment than words reported in the body of articles. If newspapers are motivated to influence readers, they may focus their bias on headlines. The last three columns of Table 7 report results for headlines. Again, none of the ideological match variables achieve statistical significance, though in the case of growth headlines, the ideological variables are jointly significant. In Figure 2, we plot the effects from the six columns of Table 7. Sentiment responds a lot to growth and changes in inflation, but ideologically matched and unmatched papers behave nearly identically on average. Even the statistically significant effect of the ideological variables for growth sentiment in headlines

corresponds to a very small effect size.

To highlight the size of the effects, moving from the 2nd percentile to the 98th percentile in growth leads growth sentiment to go from 30% positive to 70% positive. The effects for growth headlines, though consistent with bias, suggest an extremely small level of bias relative to the overall responsiveness to growth. Moving from the 2nd percentile to the 98th percentile leads sentiment in headlines to move from 25% positive to 70% positive. Ideologically matched papers are 1 to 3 percentage points more positive than unmatched papers. Unemployment sentiment is not very sensitive to changes in unemployment while inflation sentiment is relatively sensitive to changes in inflation through the effect is not as large as what we find for growth. Overall, and in contrast some other scholars (e.g., Lott and Hassett, 2014), we find weak to no evidence for ideological bias in tone in both text and headlines.

6.2 The Frequency of Coverage

While newspapers are not very biased in their tone, they may exhibit ideological bias in the frequency of coverage they devote to the economy. Newspapers that ideologically match the government, for example, might report more (less) often on a strong (weak) economy than their ideologically unmatched counterparts. We test this hypothesis by employing the relative share of economic coverage devoted to growth, unemployment, and inflation as dependent variables. We include measures of the economy, ideological match, and interactions between these as independent variables. If newspapers indeed bias their frequency of coverage due to partisanship, we would expect (a) the ideological match variables to be jointly significant and (b) the particular economic measure to receive more coverage by matched newspapers when the economy is doing well (high growth, low unemployment, and low inflation) and less coverage by matched newspapers when the economy is doing poorly. In the first three columns of Table 8, we regress the share of coverage devoted to growth, unemployment, and

inflation, on the economic, match and interaction variables.[7] The ideological orientation of newspapers most often does not seem to influence the share of coverage they devote to growth and inflation. While we find that newspapers focus on bad news, unmatched newspapers are not more likely to do so *than matched papers* for growth and inflation. For unemployment, however, we do find that ideology influences frequency of coverage, albeit to a small extent—the ideological match terms are jointly significant.

We might expect that the effects of media bias would be larger in the headlines for the stories. The last three columns of Table 8 report the relevant results. We do not find any differences in headlines between ideologically matched and unmatched newspapers, though we continue to find that newspapers focus on bad news.

These patterns are expanded on in Figure 3. This figure reports the predicted share of coverage, as a function of the economy and whether there is an ideological match between the newspaper and the current prime minister. Matched and unmatched papers show little difference for growth and inflation but unemployment is different. While both matched and unmatched newspapers increase their coverage of unemployment as unemployment increases, the share of coverage by matched papers is higher than that by unmatched newspapers when unemployment is low; and the reverse is true when unemployment is high. The inflection point happens very close to the average unemployment rate in the sample, suggesting that matched papers report relatively more on unemployment when unemployment is below average and unmatched newspapers report relatively more on unemployment when unemployment is above average. This effect, while present and statistically significant, is rather small in magnitude relative to the sensitivity of the share of coverage to the performance of the economy. At the 2nd percentile of unemployment, matched papers devote 14 percent of

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[7]The specification was motivated by the findings of Table 4, where we found that the share of coverage for unemployment and inflation responded most to levels of unemployment and inflation, respectively.

their coverage to unemployment while unmatched papers devote 12 percent. At the 98th percentile of unemployment, matched papers devote 31 percent of their coverage to unemployment while unmatched papers devote 33 percent. We take this as evidence of a small amount of ideological bias in the coverage of unemployment.

Taken together, we find little bias in the tone or frequency of coverage in mainstream newspapers. Where we do find some bias—in the headline sentiment corresponding to growth and in the amount of media coverage for unemployment, the substantive magnitude of the effects is small. Interestingly, our results on the share of unemployment coverage comport with Larcinese, Puglisi and Snyder (2011), who find that in the United States, opposition newspapers focus more on unemployment when unemployment is high.
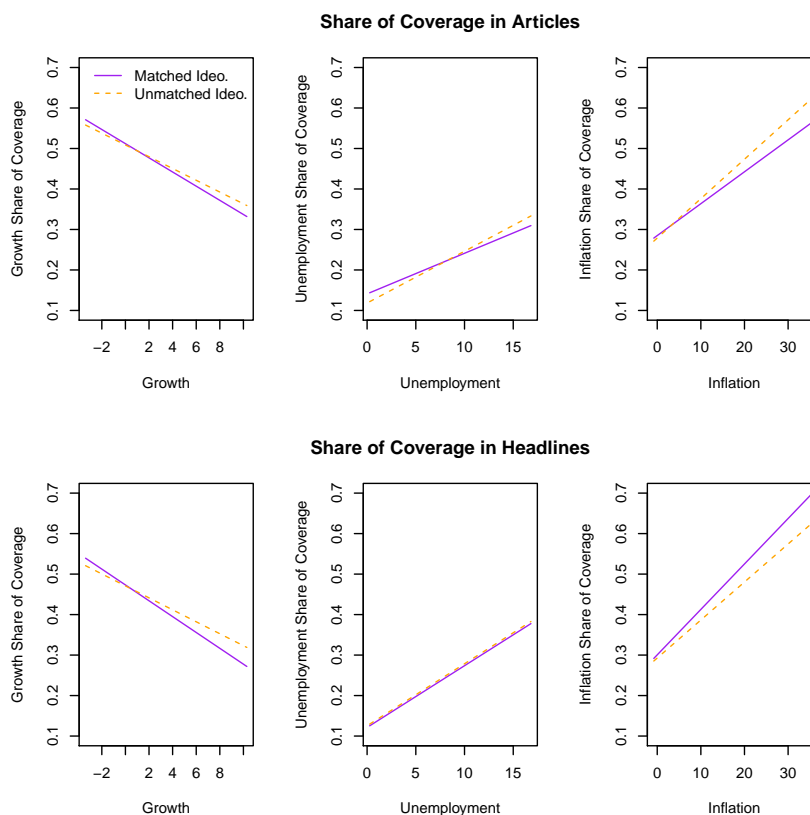

Figure 3: *Coverage vs. the Economy for Ideologically Matched and Unmatched Newspapers – Results are calculated based on Table 8.*

Dependent Variable:	Growth Coverage (articles)	Unemployment Coverage (articles)	Inflation Coverage (articles)	Growth Coverage (headlines)	Unemployment Coverage (headlines)	Inflation Coverage (headlines)
Independent Variables:						
Growth (yearly)	-0.015*** (0.002)			-0.015*** (0.003)		
Unemployment (yearly)		0.013*** (0.002)			0.015*** (0.002)	
Inflation (yearly)			0.010*** (0.002)			0.009** (0.003)
Ideological Match	0.003 (0.010)	0.023 (0.017)	0.006 (0.017)	0.002 (0.012)	-0.004 (0.026)	0.008 (0.022)
Growth * Ideo. Match	-0.003 (0.003)			-0.005 (0.004)		
Unem. * Ideo. Match		-0.003+ (0.002)			0.000 (0.003)	
Inf. * Ideo. Match			-0.002 (0.004)			0.002 (0.004)
p-Value from Wald Test:						
Ideo. = Ideo. * Growth = 0	0.490			0.517		
Ideo. = Ideo. * Unem. = 0		0.171			0.850	
Ideo. = Ideo. * Inf. = 0			0.899			0.807
Number of Months	6513	6521	6525	6269	6274	6276
Number of Newspapers	32	32	32	31	31	31
Number of Countries	16	16	16	16	16	16
R-Squared	0.641	0.626	0.697	0.305	0.226	0.308

Table 8: *Media Bias in Coverage — Newspaper fixed effects were included in the analysis, but omitted from the table. Standard errors clustered by newspaper in parentheses. In all cases, the null hypothesis in the Wald test is that Ideological Match and its interaction with the economy are jointly zero.* $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

6.3 Possible Concerns and Robustness Checks

Our result that mainstream newspapers are generally not biased in their coverage could be considered surprising and thus deserving of some scrutiny. In Appendix A.3, we consider a number of tests of our methodology and robustness checks. We confirm that our method works by demonstrating that it uncovers ideological bias when applied to explicitly partisan text—records of US Senate speeches between 1995 and the present. We demonstrate that our main conclusions from Section 6 remain when we apply similar methods to the period six months prior to an election, when continuous measures of newspaper and government ideology are used, and when left-wing and right-wing newspapers are allowed to exhibit different patterns of bias. Finally, we demonstrate our main conclusions from Sections 5 and 6 remain when we substitute human-coded measures of sentiment and coverage for dictionary-coded ones.

7 Conclusion

Many canonical findings in the study of elections, such as economic (Duch and Stevenson, 2008) and sociotropic voting (Kinder and Kiewiet, 1979), depend on voters' information about the economy. Thus, inaccurate but unbiased coverage (whether in tone or frequency) bears implications for the degree of electoral accountability as well as the balance of aggregate and pocketbook economic influences on the vote. The potential consequences of biased coverage are no less important. Non-ideological negativity bias—the more frequent coverage of negative economic news—could partly explain why incumbent governments decline in popularity over time (Paldam, 1986). Ideological bias could explain partisan advantage and potential manipulation, witting or not, of voters by the mainstream press (Groseclose and Milyo, 2005; Lott and Hassett, 2014).

Data from this study, the first large-scale cross-national analysis of newspaper coverage

of the economy, suggest that mainstream newspapers cover the economy, in both tone and frequency, with reasonable fidelity. The only notable exception to this characterization is the tendency for newspapers to devote more coverage to negative economic outcomes. Ideological bias does emerge in two cases—the tone of growth headlines and the frequency of unemployment articles—but the latter proves un-robust to continuous measures of ideology and both reach only trivial magnitudes. Our results show that most of the time in most countries, mainstream newspapers report accurately and without ideological bias.

References

Ansolabehere, Stephen, Rebecca Lessem and James M. Snyder. 2006. "The Orientation of Newspaper Endorsements in U.S. Elections, 1940–2002." *Quarterly Journal of Political Science* 1:393–404.

Arceneaux, Kevin, Martin Johnson, René Lindstädt and Ryan J. Vander Wielen. 2016. "The Influence of News Media on Political Elites: Investigating Strategic Responsiveness in Congress." *American Journal of Political Science* 60:5–29.

Blood, Deborah J. and Peter C.B. Phillips. 1995. "Recession Headline News, Consumer Sentiment, the State of the Economy and Presidential Popularity: A Time Series Analysis 1989–1993." *International Journal of Public Opinion Research* 7:2–22.

Bloom, Howard S. and H. Douglas Price. 1975. "Voter Response to Short-Run Economic Conditions: The Asymmetric Effect of Prosperity and Recession." *American Political Science Review* 69:1240–1254.

Boomgaarden, Hajo G., Joost Van Spanje, Rens Vliegenthart and Claes H. De Vreese. 2011. "Covering the Crisis: Media Coverage of the Economic Crisis and Citizens' Economic Expectations." *Acta Politica* 46:353–379.

Boydstun, Amber E., Benjamin Highton and Suzanna Linn. Forthcoming. "Relationship between Economic News Coverage and Mass Economic Attitudes." *Political Research Quarterly* .

Chiang, Chun-Fang and Brian Knight. 2011. "Media Bias and Influence: Evidence from Newspaper Endorsements." *Review of Economic Studies* 78:795—820.

Croushore, Dean and Tom Stark. 2003. "A Real-Time Data Set for Macroeconomists: Does the Data Vintage Matter." *Review of Economics and Statistics* 85(3):605–617.

D'Alessio, Dave and Mike Allen. 2000. "Media Bias in Presidential Elections: A Meta-analysis." *Journal of Communication* 50:133–156.

De Boef, Suzanna and Paul M. Kellstedt. 2004. "The Political (and Economic) Origins of Consumer Confidence." *American Journal of Political Science* 48:633–649.

DellaVigna, Stefano and Ethan Kaplan. 2007. "The Fox News Effect: Media Bias and Voting." *Quarterly Journal of Economics* 122:1187–1234.

Druckman, James N. 2005. "Media Matter: How Newspapers and Television News Cover Campaigns and Influence Voters." *Political Communication* 22:463–481.

Duch, Raymond M. and Randy Stevenson. 2008. *The Economic Vote: How Political and Economic Institutions Condition Election Results.* Cambridge: Cambridge University Press.

Enikolopov, Ruben, Maria Petrova and Ekaterina Zhuravskaya. 2011. "Media and Political Persuasion: Evidence from Russia." *American Economic Review* 101:3253–3285.

Garz, Marcel. 2013. "Unemployment Expectations, Excessive Pessimism, and News Coverage." *Journal of Economic Psychology* 34:156–168.

Garz, Marcel. 2014. "Good News and Bad News: Evidence of Media Bias in Unemployment Reports." *Public Choice* 161:499–515.

Garz, Marcel. 2018. "Effects of Unemployment News on Economic Perceptions: Evidence from German Federal States." *Regional Science and Urban Economics* 68:172–190.

Gasper, John. 2009. "Reporting for Sale: The Market for News Coverage." *Public Choice* 141:493–508.

Gentzkow, Matthew and Jesse M. Shapiro. 2010. "What Drives Media Slant? Evidence from U.S. Daily Newspapers." *Econometrica* 78:35–71.

Gentzkow, Matthew and Jesse M. Shapiro. 2011. "Ideological Segregation Online and Offline." *Quarterly Journal of Economics* 126:1799–1839.

Gerber, Alan S., Dean Karlan and Daniel Bergan. 2009. "Does the Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions." *American Economic Journal: Applied Economics* 1:35–52.

Goidel, Kirby, Stephen Procopio, Dek Terrell and H. Denis Wu. 2010. "Sources of Economic News and Economic Expectations." *American Politics Research* 38:759–777.

Goidel, Robert K. and Ronald E. Langley. 1995. "Media Coverage of the Economy and Aggregate Economic Evaluations: Uncovering Evidence of Indirect Media Effects." *Political Research Quarterly* 48:313–328.

Groeling, Tim. 2013. "Media Bias by the Numbers: Challenges and Opportunities in the Empirical Study of Partisan News." *Annual Review of Political Science* 16:129–151.

Groseclose, Tim and Jeffrey Milyo. 2005. "A Measure of Media Bias." *Quarterly Journal of Economics* 120:1191–1237.

Heffington, Colton, Brandon Beomseob Park and Laron K. Williams. Forthcoming. "The 'Most Important Problem' Dataset (MIPD): A New Dataset on American Issue Importance." *Conflict Management and Peace Science* .

Hetherington, Marc J. 1996. "The Media's Role in Forming Voters' National Economic Evaluations in 1992." *American Journal of Political Science* 40:372–395.

Hollanders, David and Rens Vliegenthart. 2011. "The Influence of Negative Newspaper Coverage on Consumer Confidence: The Dutch Case." *Journal of Economic Psychology* 32:367–373.

Hopkins, Daniel J., Eunji Kim and Soojong Kim. 2017. "Does Newspaper Coverage Influence or Reflect Public Perceptions of the Economy?" *Research & Politics* 4:1–7.

Hopkins, Daniel J. and Jonathan M. Ladd. 2014. "The Consequences of Broader Media Choice: Evidence from the Expansion of Fox News." *Quarterly Journal of Political Science* 9:115–135.

Kahneman, Daniel and Amos Tversky. 2000. *Choices, Values, and Frames.* Cambridge University Press.

Kern, Holger Lutz and Jens Hainmueller. 2009. "Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes." *Political Analysis* 17:377—399.

Kinder, Donald R. and D. Roderick Kiewiet. 1979. "Economic Discontent and Political Behavior: The Role of Personal Grievances and Collective Economic Judgments in Congressional Voting." *American Journal of Political Science* 23:495–527.

Ladd, Jonathan M. and Gabriel S. Lenz. 2009. "Exploiting a Rare Communication Shift to Document the Persuasive Power of the News Media." *American Journal of Political Science* 53:394–410.

Larcinese, Valentino, Riccardo Puglisi and James M. Snyder. 2011. "Partisan Bias in Economic News : Evidence on the Agenda-Setting Behavior of U.S. Newspapers." *Journal of Public Economics* 95:1178–1189.

Lott, John R. and Kevin A. Hassett. 2014. "Is Newspaper Coverage of Economic Events Politically Biased?" *Public Choice* 160:65–108.

Paldam, Martin. 1986. "The Distribution of Election Results and the Two Explanations for the Cost of Ruling." *European Journal of Political Economy* 2(1):5–24.

Paldam, Martin and Peter Skott. 1995. "A Rational Voter Explanation of the Cost of Ruling." *Public Choice* 83(1):159–172.

Patterson, Thomas E. and Wolfgang Donsbach. 1996. "News Decisions: Journalists as Partisan Actors." *Political Communication* 13:455–468.

Péladeau, Normand. 1998. "WordStat Content Analysis Module for SIMSTAT & QDA miner: User's Guide." *Provalis Research, Montreal, Canada* pp. 22–29.

Powell, Bingham G. and Guy D. Whitten. 1993. "A Cross-National Analysis of Economic Voting: Taking Account of the Political Context." *American Journal of Political Science* 37:391–414.

Puglisi, Riccardo. 2011. "Being the New York Times: the Political Behaviour of a Newspaper." *B.E. Journal of Economic Analysis and Policy* 11:1–34.

Puglisi, Riccardo and James M. Snyder. 2014. "The Balanced U.S. Press." *Journal of the European Economic Association* 13:240–264.

Puglisi, Riccardo and James M. Snyder. 2015. Empirical Studies of Media Bias. In *Handbook of Media Economics.* Vol. 1 Elsevier pp. 647–667.

Roberts, Marilyn and Maxwell McCombs. 1994. "Agenda Setting and Political Advertising: Origins of the News Agenda." *Political Communication* 11:249–262.

Sanders, David and Neil Gavin. 2004. "Television News, Economic Perceptions, and Political Preferences in Britain, 1997–2001." *Journal of Politics* 66:1245–1266.

Schudson, Michael. 2011. "The Objectivity Norm in American Journalism." *B.E. Journal of Economic Analysis and Policy* 2:149–170.

Snyder, James M. and David Strömberg. 2010. "Press Coverage and Political Accountability." *Journal of Political Economy* 118:355–408.

Soroka, Stuart N. 2006. "Good News and Bad News: Asymmetric Responses to Economic Information." *Journal of Politics* 68:372–385.

Soroka, Stuart N. 2012. "The Gatekeeping Function: Distributions of Information in Media and the Real World." *Journal of Politics* 74:514–528.

Soroka, Stuart N., Dominik A. Stecula and Christopher Wlezien. 2014. "It's (Change in) the (Future) Economy, Stupid: Economic Indicators, the Media, and Public Opinion." *American Journal of Political Science* 59:457–474.

Strömberg, David. 2004. "Radio's Impact on Public Spending." *Quarterly Journal of Economics* 119:189–221.

Tucker, Joshua A. 2006. *Regional Economic Voting: Russia, Poland, Hungary, Slovakia, and the Czech Republic, 1990-1999.* Cambridge University Press.

Wlezien, Christopher, Stuart N. Soroka and Dominik Stecula. 2017. "A Cross-National Analysis of the Causes and Consequences of Economic News." *Social Science Quarterly* 98:1010–1025.

A   Online Appendix

A.1   Human Coding

In this appendix, we provide further details on the human coding. We applied human coding to three languages covering 13 of the 16 countries in our sample. Two research assistant coded approximately 1500 English articles and headlines, 750 German articles and headlines, and 500 French articles and headlines. For both articles and headlines, the coders coded items on the overall economy, growth, unemployment, and inflation. In each case, the coders coded the article on a 5-point scale (strongly negative, weakly negative, neutral, weakly positive, and strongly positive), or indicated that the article of headline was not substantially about the economy, growth, unemployment, and inflation, respectively.

Table 9 report the reliability of the coding. For the topic of the articles, the error rate was quite small in most cases. Identifying growth articles consistently proved to be the hardest task. For coding sentiment, the coders did not always select the same point on the 5 point scale, but it was rare to find a pure error—where one coder coded the article/headline as positive and the other coded it as negative.

A.2   Checking the Measures

Each monthly measure of sentiment is based on a fraction of economic words that are near positive rather than negative words. The standard error for this proportion is given by $SE_j = \sqrt{\frac{p_j(1-p_j)}{W_j}}$ where p_j is the proportion of economic words near positive words and W_j is the number of economic words in newspaper-month j. To get a sense of how noisy our measure of sentiment is, we report the average, the 2.5%, and the 97.5% quantiles for each of the 32 newspapers in our sample. These results are reported in Table 10. The amount of measurement error varies quite a bit, with the German and Luxembourgian papers having the most measurement error and the U.S. papers having the least measurement error.

Economic Articles

	All Articles	All Headlines	English Articles	English Headlines	French Articles	French Headlines	German Articles	German Headlines
Topic:								
Both Yes	0.450	0.358	0.499	0.437	0.548	0.412	0.290	0.161
Both No	0.428	0.521	0.359	0.419	0.336	0.508	0.624	0.738
Error	0.122	0.121	0.142	0.144	0.116	0.080	0.086	0.101
Kappa	0.757	0.754	0.709	0.712	0.765	0.836	0.808	0.723
n	2696	2770	1448	1528	500	498	748	744
Sentiment:								
Same	0.775	0.795	0.779	0.786	0.772	0.839	0.763	0.769
Same Direction	0.062	0.074	0.061	0.074	0.067	0.070	0.059	0.083
One Neutral	0.110	0.100	0.092	0.107	0.147	0.059	0.129	0.130
Error	0.053	0.031	0.067	0.033	0.013	0.032	0.048	0.019
Kappa	0.666	0.725	0.670	0.707	0.663	0.797	0.645	0.701
n	1062	902	652	608	224	186	186	108

Growth Articles

	All Articles	All Headlines	English Articles	English Headlines	French Articles	French Headlines	German Articles	German Headlines
Topic:								
Both Yes	0.400	0.330	0.416	0.339	0.435	0.339	0.247	0.147
Both No	0.404	0.487	0.411	0.484	0.361	0.521	0.407	0.441
Error	0.197	0.183	0.173	0.177	0.204	0.141	0.345	0.412
Kappa	0.606	0.628	0.654	0.641	0.591	0.672	0.202	0.175
n	1714	1548	1290	1288	230	192	194	68
Sentiment:								
Same	0.765	0.784	0.762	0.772	0.778	0.875	0.773	0.900
Same Direction	0.082	0.093	0.074	0.090	0.111	0.125	0.136	0.100
One Neutral	0.079	0.086	0.081	0.097	0.089	0.000	0.000	0.000
Error	0.074	0.036	0.083	0.041	0.022	0.000	0.091	0.000
Kappa	0.693	0.749	0.668	0.711	0.776	1.000	0.812	1.000
n	582	440	470	390	90	40	22	10

Unemployment Articles

	All Articles	All Headlines	English Articles	English Headlines	French Articles	French Headlines	German Articles	German Headlines
Topic:								
Both Yes	0.134	0.050	0.088	0.028	0.284	0.139	0.474	0.600
Both No	0.775	0.931	0.828	0.957	0.608	0.835	0.382	0.200
Error	0.091	0.019	0.085	0.015	0.108	0.026	0.145	0.200
Kappa	0.689	0.823	0.667	0.777	0.737	0.875	0.579	0.482
n	1576	1494	1278	1280	222	194	76	20
Sentiment:								
Same	0.793	0.781	0.795	0.867	0.778	0.682	0.812	0.750
Same Direction	0.069	0.109	0.057	0.100	0.074	0.091	0.094	0.167
One Neutral	0.075	0.078	0.057	0.033	0.130	0.182	0.031	0.000
Error	0.063	0.031	0.091	0.000	0.019	0.045	0.062	0.083
Kappa	0.692	0.773	0.660	0.932	0.625	0.450	0.812	0.833
n	174	64	88	30	54	22	32	12

Inflation Articles

	All Articles	All Headlines	English Articles	English Headlines	French Articles	French Headlines	German Articles	German Headlines
Topic:								
Both Yes	0.056	0.018	0.057	0.017	0.027	0.026	0.175	0.000
Both No	0.890	0.963	0.882	0.962	0.959	0.969	0.750	1.000
Error	0.054	0.019	0.061	0.021	0.014	0.005	0.075	0.000
Kappa	0.637	0.612	0.639	0.567	0.799	0.895	0.387	1.000
n	1544	1462	1282	1266	222	194	40	2
Sentiment:								
Same	0.794	0.714	0.804	0.700	0.667	0.750	0.833	
Same Direction	0.088	0.000	0.107	0.000	0.000	0.000	0.000	
One Neutral	0.088	0.214	0.071	0.300	0.167	0.000	0.167	
Error	0.029	0.071	0.018	0.000	0.167	0.250	0.000	
Kappa	0.749	0.293	0.812	0.062	0.183	0.500	-0.174	
n	68	14	56	10	6	4	6	0

Table 9: Coder Reliability.

	Mean S.E.	2.5% Quantile of S.E.	97.5% Quantile of S.E.
The Age (Australia)	0.012	0.008	0.015
Herald Sun (Australia)	0.018	0.011	0.022
Der Standard (Austria)	0.057	0.027	0.087
Die Presse (Austria)	0.052	0.028	0.080
Toronto Star (Canada)	0.012	0.007	0.017
The Globe and Mail (Canada)	0.011	0.008	0.013
Le Monde (France)	0.037	0.024	0.061
Le Figaro (France)	0.037	0.024	0.067
Die Zeit (Germany)	0.067	0.031	0.105
Frankfurter Allgemeine (Germany)	0.087	0.046	0.156
Irish Times (Ireland)	0.013	0.010	0.018
Irish Independent (Ireland)	0.017	0.011	0.022
Globes (Israel)	0.034	0.023	0.052
Jerusalem Post (Israel)	0.023	0.015	0.032
La Stampa (Italy)	0.021	0.016	0.032
Corriere della Sera (Italy)	0.016	0.013	0.023
Nikkei Weekly (Japan)	0.025	0.018	0.034
Daily Yomiuri (Japan)	0.026	0.017	0.038
Le Quotidien (Luxembourg)	0.071	0.035	0.126
Le Fax d'Agefi (Luxembourg)	0.058	0.036	0.158
The Press (New Zealand)	0.028	0.017	0.074
New Zealand Herald (New Zealand)	0.018	0.012	0.028
Correio da Manha (Portugal)	0.054	0.035	0.094
Jornal de Noticias (Portugal)	0.050	0.029	0.089
El Pais (Spain)	0.025	0.015	0.038
El Mundo (Spain)	0.032	0.016	0.052
Tages-Anzeiger (Switzerland)	0.073	0.033	0.111
Neue Zürcher Zeitung (Switzerland)	0.037	0.017	0.048
Guardian (U.K.)	0.015	0.010	0.021
The Times (U.K.)	0.014	0.008	0.019
New York Times (U.S.)	0.009	0.007	0.011
Wall Street Journal (U.S.)	0.011	0.006	0.022

Table 10: *Sampling Error in Dictionary Coding.*

The above table implicitly assumed two things—that each pairing of a positive/negative word with an economic word in the text produces an unbiased estimate of sentiment and that the errors were independent across such sentence fragments. Since these assumptions may be violated, the table can be interpreted as a lower bound on the level of measurement error in our monthly measure of sentiment. To get a better idea of the amount of measurement error, we relied on human coding of a sample of articles as a benchmark. The most straightforward comparison would be to code all articles from a random sample of months and use this to construct a monthly measure of human-coded sentiment, but this is not feasible—even coding a sample of 100 months would require coding about 50,000 articles. Instead, we human-coded a random sample of articles and headlines and extrapolated from this sample to measure the error in our monthly estimates.

We had a team of trained research assistants code the articles and (separately) headlines in three of the languages according to the following scheme. Each coder was instructed to code the coverage and tone of the overall economy, growth, unemployment, and inflation for a series of articles and headlines. Each item was coded based on whether the article/headline was strongly negative, weakly negative, neutral, weakly positive, strongly positive, or not applicable. For example, an article would be coded as not applicable on inflation if it was not substantially about inflation. The articles and headlines coded were a stratified random sample. The sample was constructed so that country-days were sampled first and within each country-day, two articles were sampled from the left-wing and right-wing newspapers from that country. Each article was then coded by two coders. The sampling scheme was designed to allow for (i) a measure of reliability between two coders, (ii) a measure of the correlation of coding errors within days, and (iii) for a direct analysis of coverage and bias on the hand-coded articles (considered later as a robustness check on our main results).

For comparison, we were able to compute our dictionary-coded measure at the article level. At the article-level, our measure is very error prone because it is based on a small number of sentence fragments (typically between 1 and 2). As a preliminary test, we ran a series of logit and ordered logit models where human-coded coverage of sentiment was the dependent variable and the article-level dictionary measure of coverage of sentiment was the independent variable. These results are given in Table 11. The results indicate a positive relationship between the dictionary-coded measures and the human coding of coverage and sentiment.

We can use these results to obtain an estimate of the amount of measurement error that accounts for the fact that the dictionary-coded measure may not be unbiased on average and the errors may not be independent. We accomplished this using a random effects model. Let s_l denote the true sentiment for article l and let $\tilde{s}_{li}$ be the human-coded sentiment for article l by coder i. We modeled $\tilde{s}_{li}$ using an ordered probit specification. There is a

	Topics							
	Articles				Headlines			
	Economy	*Growth*	*Unem.*	*Inflation*	*Economy*	*Growth*	*Unem.*	*Inflation*
Coef.	93.34***	82.73***	314.07***	132.12***	11.65***	4.81**	35.26***	22.38***
	(8.63)	(12.26)	(38.50)	(16.49)	(1.58)	(1.82)	(7.75)	(2.55)
N	2966	2124	2026	2007	3080	1893	1838	1818

	Sentiment (Logit model)							
	Articles				Headlines			
	Economy	*Growth*	*Unem.*	*Inflation*	*Economy*	*Growth*	*Unem.*	*Inflation*
Coef.	0.63**	0.44+	2.05***	1.30*	2.85***	3.01**	3.51**	42.72***
	(0.22)	(0.23)	(0.50)	(0.65)	(0.62)	(1.06)	(1.29)	(2.93)
N	851	507	172	107	103	47	24	9

	Sentiment (Ordered Logit model)							
	Articles				Headlines			
	Economy	*Growth*	*Unem.*	*Inflation*	*Economy*	*Growth*	*Unem.*	*Inflation*
Coef.	0.54**	0.35+	1.72***	0.93	2.50***	2.54***	3.23**	6.75
	(0.18)	(0.20)	(0.40)	(0.57)	(0.51)	(0.76)	(1.05)	(4.98)
N	978	558	184	121	119	52	25	11

Table 11: *Comparing Human Coding to Dictionary Coding. In each case, the dependent variable is the human-coded measure and the independent variable is the dictionary-based measure. Constant terms and cutpoints are omitted from the table. Standard errors in parentheses.* $^+p < .10,$ $^*p < .05,$ $^{**}p < .01,$ $^{***}p < .001.$

latent variable $\tilde{s}_{li}^* = s_l + \varepsilon_{li}^R$ where $\varepsilon_{li}^R \sim N(0, \sigma_R)$ are i.i.d. We assume that we observe $\tilde{s}_{li} \in \{1, 2, 3, 4, 5\}$ depending on where the latent variable falls relative to 4 cutpoints. We modeled the dictionary-coded measure as $s_l = a + bs_l + \varepsilon_l^L + \varepsilon_d^D(l) + \varepsilon_m^M(l)$ where $\varepsilon_l^L \sim N(0, \sigma_L)$, $\varepsilon_l^D \sim N(0, \sigma_D)$, $\varepsilon_l^M \sim N(0, \sigma_M)$, $d(l)$ indicates the day of article l, and $m(l)$ denotes the month of article l. The model allows for the errors of the dictionary-coded measures be correlated within days and within months. It also allows for the possibility that the dictionary-coded measure may be poor if b is small relative to the size of the errors.

We estimated the model above using Simulated Maximum Likelihood. Our estimates indicate that $\hat{\sigma}_L = 0.323$ with a standard error of (0.013), $\hat{\sigma}_D = 0.032$ with a standard error of (0.111), and $\hat{\sigma}_M = 0.006$ with a standard error of (0.015). We find that the idiosyncratic error is the largest component of the error, but there is a degree of error that is correlated within the same day. This suggests that the error of the dictionary-coded measure will not completely disappear if we have an infinite number of articles within each month. Under the assumption that the number of articles in each day of the same month and that there are 30 days in each
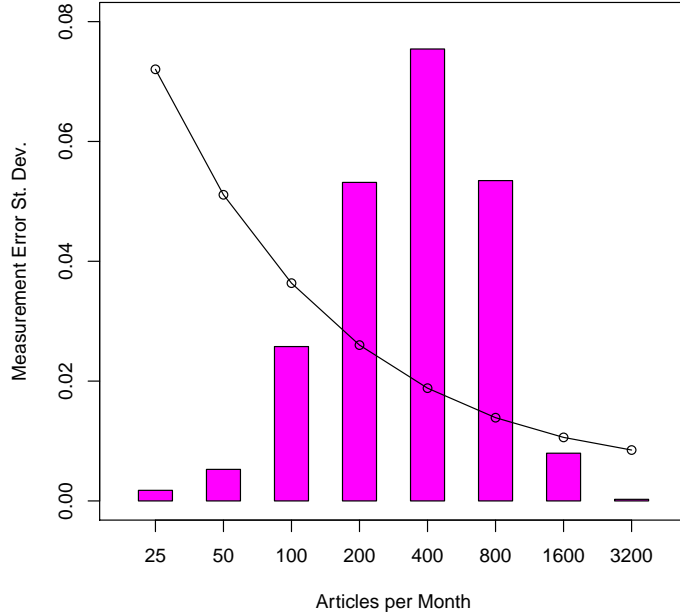
Figure 4: *Measurement Error in Sentiment — The line represents the amount of measurement error in the monthly estimates of sentiment implied by the model. The magenta bars represent the distribution of articles per month. The scale on the left is for the line representing the amount of measurement error.*

month, we can calculate that the measurement error will be $SE_j = \sqrt{\sigma_L^2/L_j + \sigma_D^2/30 + \sigma_M^2}$ where L_j is the number of articles in newspaper-month j. Figure 4 presents these results along with the distribution of articles per month in our dataset. For most months, the standard error of our measure of sentiment will range between 0.015 and 0.035. In months where there is a very large number of articles, the standard deviation can go to as low as 0.008. Since the scale ranges between 0 and 1, this suggests that our measure is relatively accurate.

A.3 Additional Analysis

Our results in Section 5 focused on every word published by the newspapers, but some words receive more prominence than others. In particular, if readers at glance all articles,

but only read some, headlines have the potential to exert more influence on voter behavior than words reported in the body of the article. We replicated the main results of that section applying our measures to headlines. We report the results in Tables 12 and 13. Our findings for headlines were very similar to our finding for articles, both in terms of how far back newspaper coverage looks, which measures of the economy affect which measures of sentiment and coverage, and how large the effect sizes are.

The result that newspapers are not biased in the tone of their coverage could be considered surprising and thus deserving of some scrutiny. We argued earlier that there is a relatively small amount of measurement error in the sentiment series and thus it should be possible to detect media bias in tone, if it exists. If fact, in most countries, the left and right-wing papers follow each other closely enough that the lack of bias in tone can be seen visually (Figure 1). As a way of further demonstrating that our method can detect media bias in tone, we applied identical methods to text that is explicitly partisan. Specifically, we used debates recorded in the Senate congressional record from 1995 to the present. We classified text by speaker in the congressional record and determined the party of the speaker. We then created a monthly time series of sentiment on growth, unemployment, and inflation, for the Democratic and Republican parties. We followed similar procedures used elsewhere in the paper and constructed a variable for the ideological match between the speaker and the incumbent President.

The results are presented in Table 14 and Figure 5, which replicates the main results of Sections 5.1 and 5.2, with the difference, of course, that we are looking for ideological bias in congressional speech. For growth and unemployment, we reject the null hypothesis that ideologically matched and unmatched Senators behave similarly. In the figure, we find that matched Senators speak more favorably about growth when growth is low and speak more favorably of unemployment when unemployment is high. In fact, matched Senators speak more favorably of unemployment when it is high than when it is low. For inflation, we have

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marginal evidence of partisan differences—matched Senators appear to speak more favorably of inflation relative to unmatched Senators when inflation is high. We find these differences despite the fact that there is more measurement error in our congressional sentiment measure and despite the fact that congressional speech is more weakly related to the economy than newspaper sentiment.

We next consider whether patterns of newspaper coverage differ during election campaigns. If newspapers tone is biased and newspapers are motivated to influence voters, they may concentrate their bias when it is most likely to affect electoral outcomes. To test this, we replicated our main results on the sample of observations within 6 months of an election. These results are reported in Table 15 and Figure 6. Our results our similar to those we found in the larger sample. For inflation, the ideological match variables are jointly significant, but the effect sizes are very small in magnitude and suggest that for most values of inflation, unmatched papers report inflation sentiment more favorably. For unemployment coverage, the effects are consistent with Figure 3, but the ideological variables are not individually or jointly significant.

Another concern is the binary nature of our measures of newspaper and prime minister ideology. To address this, we coded the thirty-two newspapers in our sample on a five point ideology scale based on various online sources.[8] We used a continuous measure of prime minister ideology based on the Comparative Manifesto Project. The scales made the analyses somewhat more difficult to interpret (which is why our main analysis used a binary ideological match variable). We specified the regression by interacting newspaper ideology and prime minister ideology and their interaction with the economic variables, focusing on the variables that interact newspaper ideology and prime minister ideology (this is essentially the same approach as Larcinese, Puglisi and Snyder, 2011). The results are presented in Table

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[8]The five point scale included the categories very liberal, somewhat liberal, moderate, somewhat conservative, and very conservative.

16. For sentiment we found largely similar results. The interactions between the position of the prime minister and the newspaper were not statistically significant. For coverage, we did find one important difference—the fraction of coverage devoted to unemployment did not seem to be sensitive to the interaction between the ideology of the prime minister and the ideology of the newspaper.

We also considered whether there were differences between left-wing and right-wing newspapers. We replicated the models in Table 7 interacting the independent variables with whether the newspaper was left-wing. Table 17 reports the result of a Wald test for whether the Ideological Match and it's interactions are jointly equal to zero. In all cases, we fail to reject the null, indicating no support for ideological bias in either sentiment or coverage.

While our main analysis was based on dictionary-coded measures, it is possible that newspaper sentiment or coverage is biased in a way that our dictionary-coded measure would not detect, but that human readers would. We replicated the main results of the paper using human coding directly as a dependent variable. We considered two types of analyses. In the first, we estimated an ordered logit models with a 5 point human-coded sentiment scale for growth, unemployment, and inflation as the dependent variable. In the second, we estimated logit models with a binary indicator for whether the economic article was coded as relating to growth, unemployment, or inflation. The results are presented in Table 18 and Figure 7, which replicate the analyses in Tables 7 and Table 8 and in Figures 2 and 3 using the human-coded measures to construct the dependent variable. The results are largely consistent with the results we reported using dictionary-coded measures. Growth and unemployment sentiment continue to be very sensitive to growth and changes in unemployment, respectively. The effect of changes in inflation on inflation sentiment is not statistically significant, though this may be due to a small sample size because fewer newspaper articles were coded as discussing inflation. In the model for growth sentiment, growth has a marginally statistically significant interaction with ideological match, though the ide-

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ological match variables are jointly insignificant and the point estimates are not consistent with ideological bias, but instead suggest that growth sentiment is more sensitive to growth among ideologically matched newspapers. We don't find any evidence for ideological bias in tone among unemployment or inflation sentiment.

We continue to find evidence for negativity bias in growth and unemployment coverage. The results for inflation coverage are consistent with a moderate degree of ideological bias. Interestingly, while we statistically detected coverage bias in unemployment using the dictionary-based measure and in inflation using the human coding measure, the actual patterns suggested by the point estimates do not differ much—using both measures, there is a very small amount of ideological bias in unemployment coverage (which was only statistically significant using the dictionary-based measure). Using both measures, there is a moderate amount of ideological bias in inflation coverage (which was only statistically significant using the human-coded measure). Overall, the results suggest no coverage bias in growth, a very small amount of coverage bias in unemployment, and weak evidence of perhaps a moderate amount of coverage bias in inflation.

Dependent Variable:	Economic Sentiment (headlines)	Growth Sentiment (headlines)	Unemployment Sentiment (headlines)	Inflation Sentiment (headlines)
Independent Variables:				
Constant	0.390***	0.370***	0.437***	0.425***
	(0.013)	(0.019)	(0.014)	(0.007)
Growth (yearly)	0.018***	0.029***	0.016***	-0.002
(SD = 3.052)	(0.003)	(0.004)	(0.003)	(0.002)
Change in Unem. (yearly)	0.000	-0.017	-0.010+	0.008+
(SD = 0.930)	(0.004)	(0.011)	(0.006)	(0.005)
Change in Inf. (yearly)	-0.004**	-0.006**	0.003+	-0.011***
(SD = 4.823)	(0.001)	(0.002)	(0.002)	(0.003)
Effect Size:	0.610***	0.742***	0.587***	0.489***
	(0.027)	(0.046)	(0.037)	(0.023)
Number of Months	6402	6087	5345	5672
Number of Newspapers	31	31	31	31
Number of Countries	16	16	16	16
R-Squared	0.060	0.101	0.031	0.016

Table 12: The Effect of the Economy on Newspaper Sentiment in Headlines — Newspaper fixed effects were included in each regression, but omitted from the table. tandard errors clustered by newspaper in parentheses. $^{+}p < .10,$ $^{*}p < .05,$ $^{**}p < .01,$ $^{***}p < .001.$

Dependent Variable:	Economic Coverage (headlines)	Growth Share of Coverage (headlines)	Unemployment Share of Coverage (headlines)	Inflation Share of Coverage (headlines)
Independent Variables:				
Growth (yearly)	-0.001***	-0.017***		
	(0.000)	(0.002)		
Unemployment (yearly)	0.000		0.015***	
	(0.000)		(0.003)	
Inflation (yearly)	0.000			0.010***
	(0.000)			(0.003)
Number of Months	6136	6402	6407	6409
Number of Newspapers	32	31	31	31
Number of Countries	16	16	16	16
R-Squared	0.739	0.306	0.230	0.309

Table 13: The Effect of the Economy on Newspaper Coverage in Headlines — Newspaper fixed effects were included in each equation, but omitted from the table. Standard errors clustered by newspaper in parentheses. $^{+}p < .10,$ $^{*}p < .05,$ $^{**}p < .01,$ $^{***}p < .001.$

Dependent Variable:	Growth Sentiment (cong. rec.)	Unemployment Sentiment (cong. rec.)	Inflation Sentiment (cong. rec.)	Growth Coverage (cong. rec.)	Unemployment Coverage (cong. rec.)	Inflation Coverage (cong. rec.)
Independent Variables:						
Growth (yearly)	0.017*** (0.002)	-0.002 (0.003)	0.009** (0.003)	-0.009** (0.004)		
Unemployment (yearly)					0.027*** (0.003)	
Change in Unemployment (yearly)		-0.008 (0.006)				
Inflation (yearly)						0.012 (0.007)
Change in Inflation (yearly)			-0.007*** (0.002)			
Ideological Match	0.032** (0.010)	0.055*** (0.013)	0.029* (0.014)	-0.001 (0.017)	-0.102*** (0.027)	-0.033 (0.029)
Growth * Ideo. Match	-0.006* (0.003)	-0.007+ (0.004)	-0.006 (0.004)	0.005 (0.005)		
Unem. * Ideo. Match					0.019*** (0.005)	
Change in Unem. * Ideo. Match		-0.003 (0.007)				
Inf. * Ideo. Match						0.004 (0.010)
Change in Inf. * Ideo. Match			0.006+ (0.003)			
p-Value from Wald Test:						
Ideo. = Ideo. * Growth = 0	0.005**			0.156		
Ideo. = Ideo. * Unem. = 0					0.000***	
Ideo. = Ideo. * Growth * Ideo. * Ch. Unem. = 0		0.000***				
Ideo. = Ideo. * Inf. = 0						0.265
Ideo. = Ideo. * Growth * Ideo. * Ch. Inf. = 0			0.051***			
Number of Months	385	325	385	416	420	422
R-Squared	0.143	0.099	0.059	0.024	0.384	0.024

Table 14: Bias in Economic Sentiment in the U.S. Senate Congressional Record — Robust standard errors in parentheses. In all cases, the null hypothesis in the Wald test is that Ideological Match and its interaction with the economy are jointly zero. $^{+}p < .10, ^{*}p < .05, ^{**}p < .01, ^{***}p < .001$.
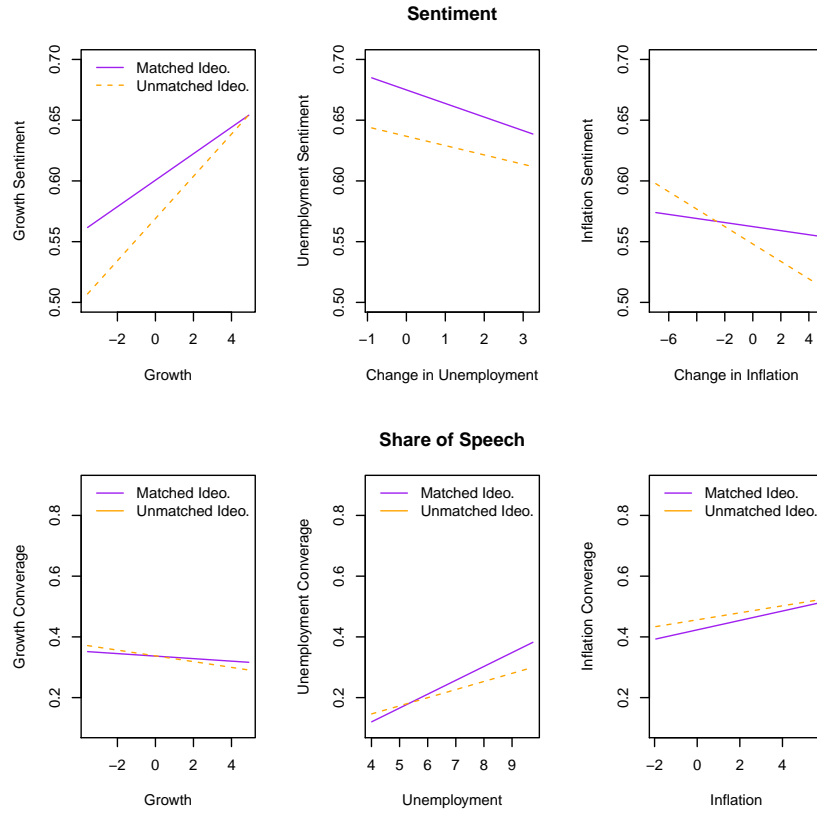
Figure 5: Sentiment and Coverage vs. the Economy for Ideologically Matched and Unmatched U.S. Senators — Results are calculated based on Table 14

Dependent Variable:	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)	Growth Coverage (articles)	Unemployment Coverage (articles)	Inflation Coverage (articles)
Independent Variables:						
Growth (yearly)	0.030*** (0.005)	0.009* (0.004)	-0.005* (0.002)	-0.011*** (0.003)		
Unemployment (yearly)					0.014*** (0.004)	
Change in Unemployment (yearly)		-0.013 (0.009)				
Inflation (yearly)						0.011*** (0.003)
Change in Inflation (yearly)			-0.014** (0.004)			
Ideological Match	0.033 (0.026)	0.003 (0.015)	-0.003 (0.012)	0.003 (0.015)	0.003 (0.037)	0.015 (0.023)
Growth * Ideo. Match	-0.005 (0.007)	-0.002 (0.005)	0.002 (0.003)	-0.004 (0.003)		
Unem. * Ideo. Match					-0.001 (0.005)	
Change in Unem. * Ideo. Match		-0.007 (0.013)				
Inf. * Ideo. Match						0.000 (0.006)
Change in Inf. * Ideo. Match			0.009* (0.005)			
p-Value from Wald Test:						
Ideo. = Ideo. * Growth = 0	0.410			0.441		
Ideo. = Ideo. * Unem. = 0		0.917			0.871	
Ideo. = Ideo. * Growth * Ideo. * Ch. Unem. = 0						
Ideo. = Ideo. * Inf. = 0			0.153			0.723
Ideo. = Ideo. * Growth * Ideo. * Ch. Inf. = 0						
Number of Months	988	986	979	988	990	990
Number of Newspapers	31	31	31	31	31	31
Number of Countries	16	16	16	16	16	16
R-Squared	0.507	0.282	0.353	0.653	0.636	0.702

Table 15: Bias in Economic Sentiment and Coverage within Six Months of an Election — Newspaper fixed effects were included in the analysis, but omitted from the table. Standard errors clustered by newspaper are in parentheses. In all cases, the null hypothesis in the Wald test is that Ideological Match and its interaction with the economy are jointly zero. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.
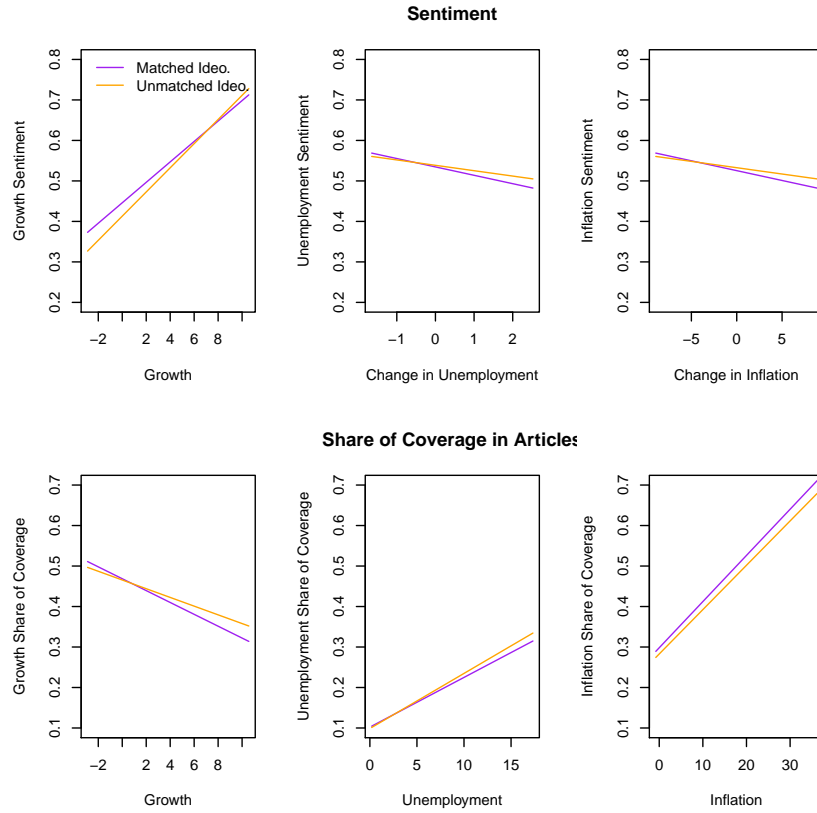
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Figure 6: Sentiment and Coverage vs. the Economy for Ideologically Matched and Unmatched Newspapers during Election Campaigns — Results are calculated based on Table 15

Dependent Variable:	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)	Growth Coverage (articles)	Unemployment Coverage (articles)	Inflation Coverage (articles)
p-Value from Wald Test:						
Interactions between Government and Newspaper Ideology = 0	0.792	0.602	0.309	0.911	0.361	0.983

Table 16: Bias in Economic Sentiment and Coverage, Continuous Measures of Ideology — Newspaper fixed effects were included in the analysis. Standard errors were clustered by newspaper. In all cases, the null hypothesis in the Wald test is that the coefficient on Newspaper Ideology * Government Ideology and it's interaction with the economy are jointly zero. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Dependent Variable:	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)	Growth Coverage (articles)	Unemployment Coverage (articles)	Inflation Coverage (articles)
p-Value from Wald Test:						
Interactions with Ideological Match = 0	0.977	0.443	0.579	0.232	0.175	0.296

Table 17: Bias in Economic Sentiment and Coverage, Left *vs.* Right-wing Papers — Newspaper fixed effects were included in the analysis. Standard errors were clustered by newspaper. In all cases, the null hypothesis in the Wald test is that the coefficient on Ideological Match and it's interactions are jointly zero. $^{+}p < .10,^{*}p < .05,^{**}p < .01,^{***}p < .001$.

Dependent Variable:

	Growth Sentiment (articles)	Unemployment Sentiment (articles)	Inflation Sentiment (articles)	Growth Coverage (articles)	Unemployment Coverage (articles)	Inflation Coverage (articles)
Independent Variables:						
Growth (yearly)	0.069* (0.032)	0.055 (0.119)	0.194 (0.163)	-0.102+ (0.055)		
Unemployment (yearly)					0.081** (0.026)	
Change in Unemployment (yearly)		-0.721** (0.271)				
Inflation (yearly)						0.107** (0.041)
Change in Inflation (yearly)			-0.219 (0.169)			
Ideological Match	-0.170 (0.236)	-0.055 (0.533)	0.832 (1.221)	-0.354+ (0.187)	0.327 (0.305)	0.249 (0.266)
Growth * Ideo. Match	0.119+ (0.065)	0.031 (0.188)	-0.240 (0.363)	0.106+ (0.059)		
Unemployment * Ideo. Match					-0.030 (0.035)	
Change in Unem. * Ideo. Match		0.577 (0.404)				
Inflation * Ideo. Match						-0.167*** (0.050)
Change in Inf. * Ideo. Match			0.298 (0.256)			
p-Value from Wald Test:						
Ideo. = Ideo. * Growth = 0	0.124			0.149		
Ideo. = Ideo. * Unem. = 0					0.557	
Ideo. = Ideo. * Growth = Ideo. * Ch. Unem. = 0		0.559				
Ideo. = Ideo. Inf. = 0						0.001***
Ideo. = Ideo. * Growth = Ideo. * Ch. Inf. = 0			0.647			
Number of Ratings	1027	377	170	1659	1602	1587
Number of Newspapers	26	25	21	26	26	26
Number of Countries	13	13	11	13	13	13

Table 18: Media Bias in Human-coded Sentiment and Coverage — Newspaper fixed effects were included in the analysis, but omitted from the table. Standard errors clustered by newspaper in parentheses. In all cases, the null hypothesis in the Wald test is that Ideological Match and its interactions with the economy are jointly zero. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.
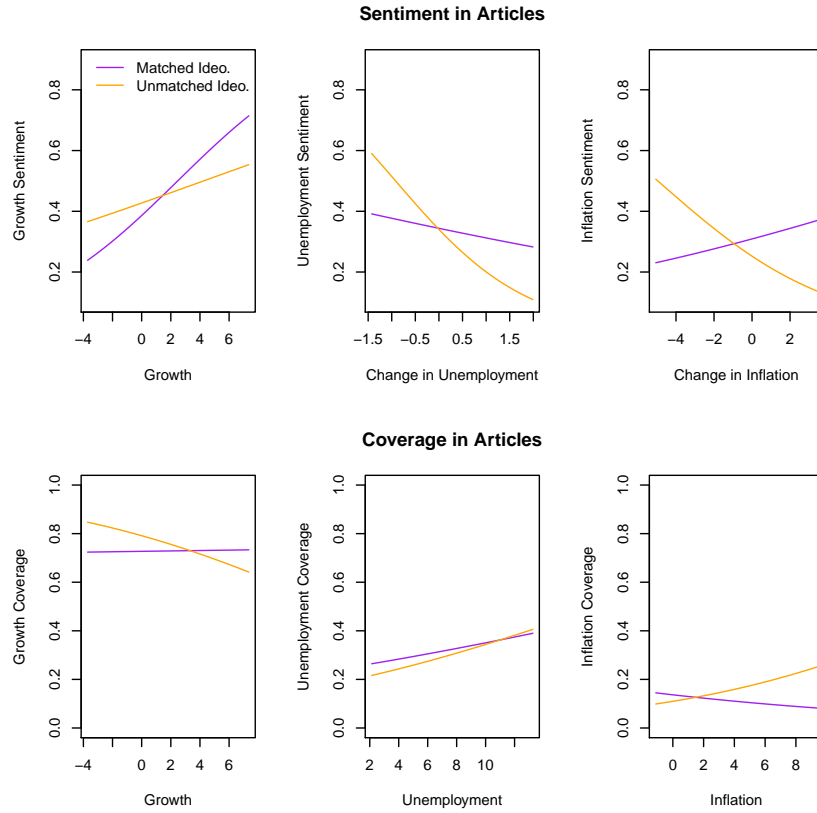
Figure 7: Human-coded Sentiment and Share of Coverage vs. the Economy for Ideologically Matched and Unmatched Newspapers— Results are calculated based on Table 18