

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 articles related to three economic indicators in 32 mainstream newspapers, one left-wing and one right-wing, in 16 developed countries and 6 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

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for growth headlines and in frequency of coverage for unemployment articles, its substantive magnitude is diminutive. Mainstream newspaper coverage of the economy provides voters with largely accurate information.

Keywords: Media coverage; voting behavior; elections; political economy; biases

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. 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 *et al.*, 2011). Endorsements by US 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. MacKuen *et al.* (1992) argue that news coverage is one of the main drivers of macroeconomic perceptions and Iyengar and Kinder (1987) argue that the framing of economic news affects how voters perceive the economy. 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 1 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. Our aim is to determine whether voters can learn what they need to learn in order to hold governments accountable for the economy through news coverage. We focus on answering three questions. First, how accurately does the tone of newspaper coverage reflect the economy? We consider whether the tone that newspapers use to describe growth, the labor market, and inflation, corresponds with growth rates, unemployment rates, and inflation rates. Second, when does the media focus on which aspect of the economy? We consider the share of newspaper coverage devoted to the economy as well as the share of economic coverage devoted to the three most important economic aggregates — growth, unemployment, and inflation. Finally, we study ideological bias in reporting on the economy — do left-wing and right-wing newspapers report on the economy in a way which is different and beneficial to left-wing and right-wing governments, respectively? We study both whether there is a bias in tone and whether there is a bias in the share of coverage devoted to growth, the labor market, and inflation.

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 considerable importance — the economy — media coverage provides readers with largely accurate information, with the exception 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.

Accuracy and Bias in the Media

Consider the range of incentives that may prevent accurate reporting. Media outlets may pander to the ideological leanings of their readers (Chiang and Knight, 2011; Gasper, 2009; Gentzkow and Shapiro, 2010). 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.

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

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, 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 (Boomgaarden *et al.*, 2011; Garz, 2013, 2018; Goidel *et al.*, 2010), and personal financial expectations (Goidel *et al.*, 2010), although other research has questioned the causal direction (Hopkins *et al.*, 2017; Wlezien *et al.*, 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 US 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 US 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 *et al.* (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 gubernatorial 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 market incentives push newspapers to slant their terminology toward the preferences of their consumers. Ansolabehere *et al.* (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 US 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 Boydston *et al.* (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 *et al.* (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 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.

The Data

Newspaper Articles

News content is fragmented over a variety of media in addition to newspapers, for example, television, social media, online news portals and blogs. 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).

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 in our sample.² The longest window of coverage starts in 1977 (*The Globe and Mail*) and the shortest in 2012 (*Correio da Manhã*). Coverage for all newspapers is 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.³ 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 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 left, -1 being center-left, 0 being centrist, 1 being center-right, and 2 being right, based on a number of web sources. For ease of interpretation, our main analysis collapses the 5-point scale into a binary variable indicating the ideological match between the newspaper and the incumbent government. In the appendix, we show that our main results continue to hold with more fine grained measures.

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 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 sentence fragments as the basis of our sentiment analysis.⁴ 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 sentence fragments in a given month — in order to match the economic data.

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

³The articles come from the LexisNexis and Proquest databases.

⁴In our context, a sentence fragment is a string of words from within a sentence.

Table 1: Dates of Coverage for 32 Newspapers.

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

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 most often 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.⁵ 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 convert 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.

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

⁵For growth, monthly values were never available and quarterly values were always available, with the exception of Israel between 1989 and 1994, where only yearly data were available. For unemployment, monthly data were available, with the exception of Israel between 1992 and 2011, where only yearly data were available. For inflation, monthly data were available with the exception for Australia and New Zealand, where quarterly data were available.

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.

Voters may be influenced by media coverage of the economy, in that their perceptions of whether the economy is performing well or poorly may be influenced by what they read. Media coverage could give these readers an accurate or inaccurate picture of how the economy is doing, where inaccuracy could take a number of forms — negativity bias, differences between left- and right-wing papers, or very little responsiveness of coverage to the actual state of the economy. Media coverage of the economy may simply report facts (e.g., “unemployment decreased this month”) or may assign valence to certain facts (e.g., “growth is anemic”). Both types of statements may influence a reader’s perceptions of the economy. Moreover, either statement could be accurate or inaccurate. The former would be accurate if unemployment did indeed decrease. The latter would be inaccurate if growth was 2%, though this would require more of a value judgement — 2% growth is a third of a standard deviation below the mean growth in our sample, so while 2% growth is arguably slightly below average, the term anemic could lead voters to view the growth as considerably below average.

A reasonable definition of accurate coverage would have the *average* reader coming away with the sense that the economy is performing averagely when the economy is performing averagely and the same reader coming away with the sense that the economy is performing well (poorly) when the economy is substantially above (below) average. 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. The definition suggests three areas where we can test for inaccuracy in media coverage. First, we can test for whether average economic conditions lead to neutral sentiment. Second, we can test for whether newspapers of differing ideological orientations cover the economy differently. Finally, we can test whether economic sentiment is sufficiently responsive to actual economic conditions. The last of these requires somewhat of a value judgement, but we will report changes in the percent of positive tone when the economy improves by one standard deviation, allowing readers to make this value judgement.

Coding of Sentiment

We sought to collect newspaper articles and code the tone of media coverage on growth, unemployment, and inflation. 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.

We applied a dictionary-based approach for coding sentiment (De Boef and Kellstedt, 2004; Soroka *et al.*, 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 four 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 the sum of positive and negative growth instances in a given month to generate our measure of sentiment for that newspaper in that month.⁶ 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 A2, we provide evidence for the validity of our measure comparing it to human coding.

⁶Our aggregation approach implicitly weights all sentence fragments equally within a month. Alternatively, one could aggregate first to the article level and then to the monthly level. If this approach were taken and articles were equally weighted, this would result in more measurement error. If articles were weighted by the number of sentence fragments, this would reduce measurement error relative to equally weighting articles, but is equivalent to the approach we take.

Accuracy of Newspaper Coverage of the Economy

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.

Table 2: Correlations between sentiment and the economy, corrected for measurement error.

	Month	Quarter	Semi-year	Year	2 Years	4 Years	<i>N</i>
Growth sentiment							
Growth	0.37	0.43	0.49	0.51	0.47	0.37	6,647
<i>Error corrected</i>	0.43	0.49	0.56	0.59	0.56	0.45	5,136
Unemployment sentiment							
Unemployment	0.01	0.02	0.04	0.07	0.11	0.15	6,599
<i>Error corrected</i>	0.00	0.02	0.04	0.09	0.17	0.22	5,128
Change in unemployment	-0.18	-0.31	-0.33	-0.27	-0.12	-0.04	6,599
<i>Error corrected</i>	-0.28	-0.49	-0.51	-0.39	-0.11	-0.01	5,128
Inflation sentiment							
Inflation	-0.07	-0.09	-0.06	-0.01	0.05	0.08	6,592
<i>Error corrected</i>	-0.16	-0.21	-0.17	-0.07	0.10	0.19	5,036
Change in inflation	0.01	-0.07	-0.10	-0.16	-0.09	-0.01	6,592
<i>Error corrected</i>	-0.02	-0.12	-0.18	-0.30	-0.21	-0.26	5,036

Largest correlation for each measure of economy is highlighted in bold.

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.

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

Table 3: The effect of the economy on newspaper sentiment.

Dependent variable:	Economic sentiment (articles)	Growth sentiment (articles)	Unemployment sentiment (articles)	Inflation sentiment (articles)
Independent variables:				
Constant	0.463*** (0.008)	0.433*** (0.012)	0.513*** (0.005)	0.510*** (0.004)
Growth (yearly) (SD = 3.053)	0.014*** (0.002)	0.024*** (0.004)	0.011*** (0.002)	-0.003* (0.001)
Change in unem. (yearly) (SD = 0.972)	-0.008 (0.005)	-0.022* (0.009)	-0.014*** (0.003)	0.007** (0.003)
Change in inf. (yearly) (SD = 5.561)	-0.003* (0.001)	-0.004 ⁺ (0.002)	0.002 (0.001)	-0.008*** (0.002)
Predicted values:				
2nd percentile	0.346	0.256	0.439	0.412
One S.D. worse than mean	0.427	0.395	0.487	0.437
At mean	0.495	0.510	0.523	0.464
One S.D. improv. over mean	0.563	0.625	0.560	0.491
98th percentile	0.642	0.757	0.603	0.517
Number of months	6,648	6,647	6,638	6,581
Number of newspapers	32	32	32	32
Number of countries	16	16	16	16
R-squared	0.468	0.482	0.300	0.249

Newspaper fixed effects were included in each regression, but omitted from the table. Standard errors clustered by newspaper in parentheses. ⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

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 effect for change in unemployment is not statistically significant. Growth sentiment, unemployment sentiment, and inflation sentiment each respond to their respective economic indicators with the expected sign.

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 6.8 percentage points.⁷ Applying the same change to growth sentiment, unemployment sentiment, and inflation sentiment would improve these by 11.5, 3.7, and 2.7 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 29.6 percentage points. The same effect for growth sentiment is over 50 percentage points, with much smaller effects for unemployment and inflation sentiment. A similar pattern holds for the R -squares for the three 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 0.495. 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 “Ideological Bias in Newspaper Coverage of the Economy” considers the issue of neutrality further by considering ideological bias in newspaper sentiment and coverage.

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

⁷6.8 = (0.563 – 0.495) * 100.

Table 4: Correlations between share of coverage and the economy.

	Month	Quarter	Semi- year	Year	2 Years	4 Years	<i>N</i>
Growth share of coverage							
Growth	-0.24	-0.27	-0.32	-0.36	-0.38	-0.33	6,648
Unemployment share of coverage							
Unemployment	0.39	0.39	0.39	0.39	0.39	0.38	6,609
Change in unemployment	-0.01	0.00	0.06	0.11	0.15	0.17	6,609
Inflation share of coverage							
Inflation	0.15	0.21	0.26	0.25	0.22	0.16	6,660
Change in inflation	0.01	0.01	0.08	0.09	0.04	0.00	6,660

Largest correlation for each measure of economy is highlighted in bold.

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 than 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.

We consider additional results in Table 5. In the first column, the dependent variable is the share of sentence fragments that mention the economy.⁸ 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.⁹ 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 — for example, three measures of the economy plus newspaper fixed effects predict 78% of the squared variation in the amount of coverage of the economy. Moreover, the effect sizes are quite large — improving each measure of the economy from the 2nd percentile to the

⁸The 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.

⁹The denominator is the number of economic words across all articles that the newspaper published in that month.

Table 5: The effect of the economy on newspaper coverage.

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*** (0.006)	-0.016*** (0.002)		
Unemployment (yearly)	0.002 (0.005)		0.012*** (0.002)	
Inflation (yearly)	-0.008 (0.007)			0.008** (0.003)
Number of months	6,136	6,648	6,656	6,660
Number of newspapers	32	32	32	32
Number of countries	16	16	16	16
<i>R</i> -squared	0.775	0.640	0.630	0.698

Newspaper fixed effects were included in each equation, but omitted from the table. Standard errors clustered by newspaper in parentheses. ⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

98th percentile leads to at least a 20 percentage point decrease in the amount of coverage on that aspect of the economy.

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 average, lose popularity over time (Paldam, 1986).

Ideological Bias in Newspaper Coverage of the Economy

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 that 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 earlier, 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

Table 6: Correlation between sentiment in left-wing and right-wing papers.

Country	Correlation	<i>N</i>
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

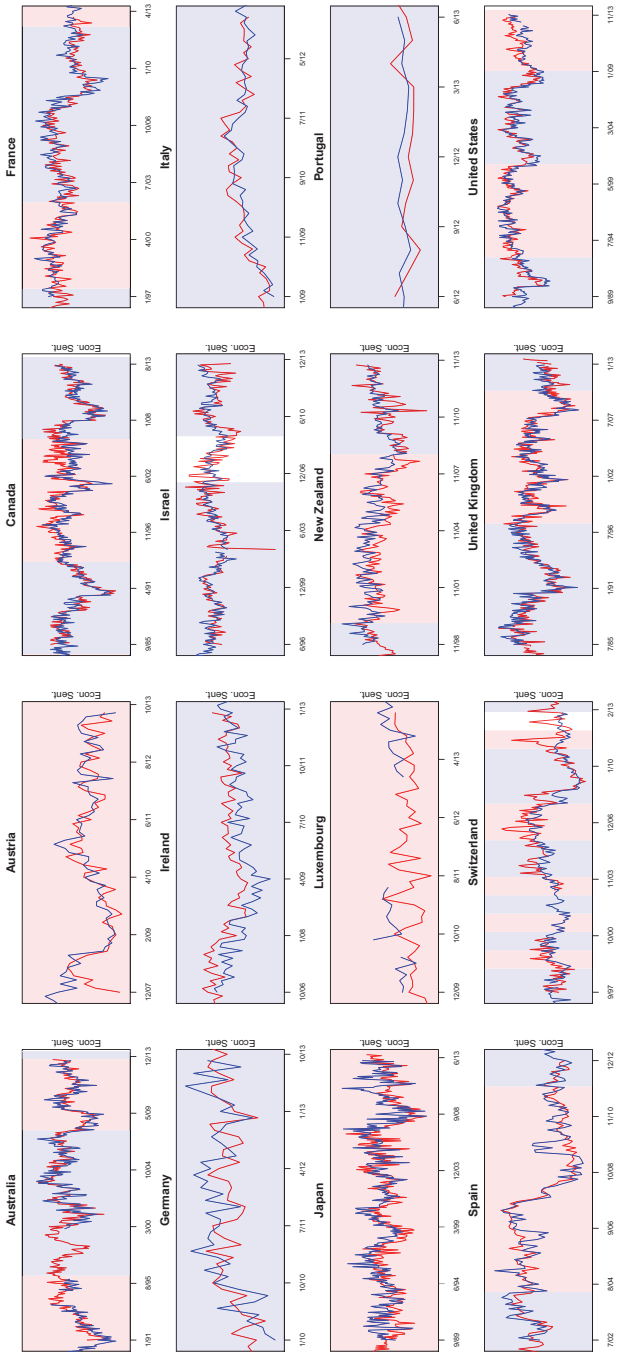


Figure 1: Comparing left-wing and right-wing sentiment. The figure reports the proportion of positive reports on the economy in left-wing (red) and right-wing (blue) newspapers over time. Red highlighting indicates a left-wing government and blue highlighting indicates a right-wing government.

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).

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.¹⁰ 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 is no evidence of ideological bias in tone.

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 1–3 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 though the effect is not as large as what we find for growth. Overall, and in contrast to 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.

¹⁰The 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.

Table 7: Media bias in sentiment.

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*** (0.005)	0.010*** (0.002)	-0.003* (0.001)	0.033*** (0.006)	0.017** (0.006)	-0.007** (0.002)
Change in unemployment (yearly)		-0.013** (0.005)			-0.011 (0.009)	
Change in inflation (yearly)			-0.010*** (0.002)			-0.013** (0.004)
Ideological match	-0.001 (0.019)	-0.002 (0.009)	0.003 (0.007)	0.016 (0.018)	0.007 (0.021)	-0.005 (0.014)
Growth * Ideo. match	0.003 (0.006)	0.002 (0.003)	-0.003 (0.002)	0.002 (0.007)	0.002 (0.007)	0.004 (0.003)
Change in unem. * Ideo. match		-0.004 (0.006)			0.004 (0.011)	
Change in inf. * Ideo. match			0.003 (0.003)			0.003 (0.004)
<i>p</i> -value from Wald test:						
Ideology terms = 0	0.826	0.835	0.280	0.066 ⁺	0.783	0.647
Number of months	6,512	6,504	6,448	5,959	5,243	5,564
Number of newspapers	32	32	32	31	31	31
Number of countries	16	16	16	16	16	16
<i>R</i> -squared	0.462	0.302	0.244	0.171	0.063	0.055

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. ⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

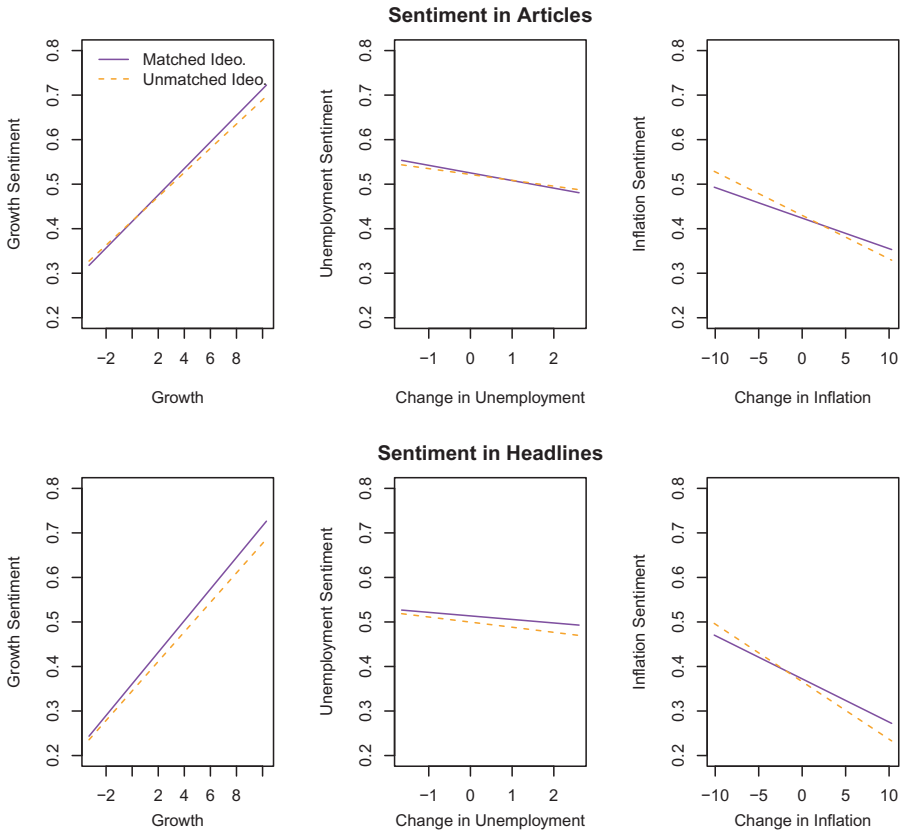


Figure 2: Sentiment vs. the economy for ideologically matched and unmatched newspapers. Results are calculated based on Table 7.

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.¹¹ The ideological orientation of newspapers most often does not seem to be related to 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 some minimal evidence that frequency of coverage is related to ideological orientation. The interaction between ideological match and unemployment is statistically significant at the 10% level, though the ideological match terms are not jointly significant and the size of the effect is very small.

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

¹¹The 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.

Table 8: Media bias in coverage.

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)
<i>p</i> -value from Wald test:						
Ideology terms = 0	0.490	0.171	0.899	0.517	0.850	0.807
Number of months	6,513	6,521	6,525	6,269	6,274	6,276
Number of newspapers	32	32	32	31	31	31
Number of countries	16	16	16	16	16	16
<i>R</i> -squared	0.641	0.626	0.697	0.305	0.226	0.308

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. ⁺ $p < .10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

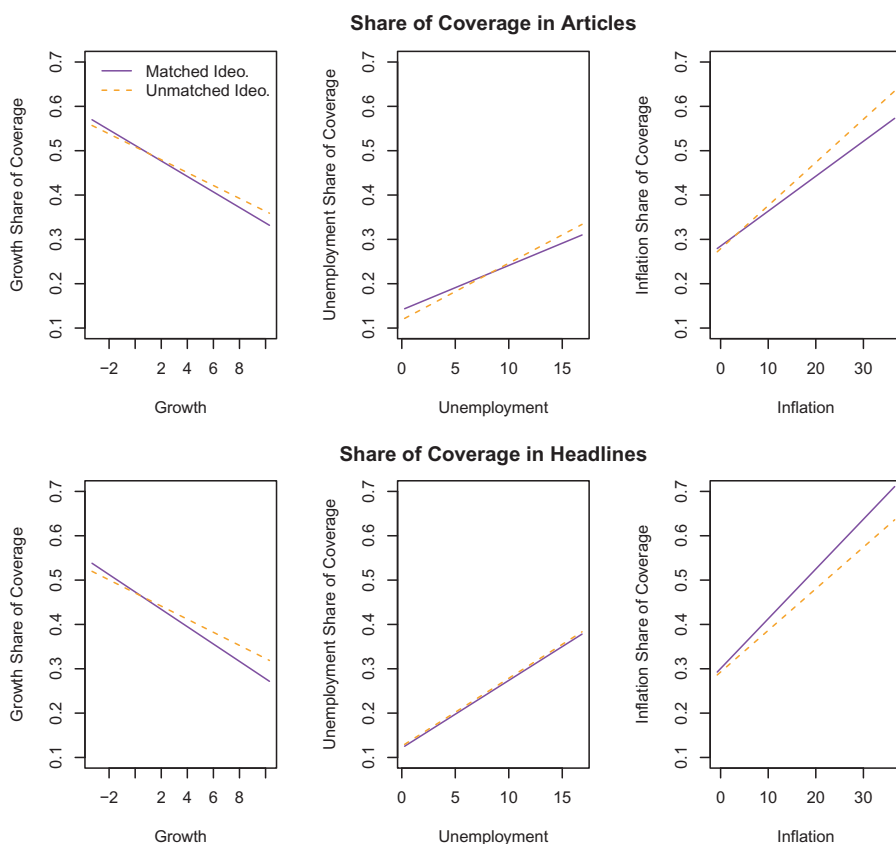


Figure 3: Coverage vs. the economy for ideologically matched and unmatched newspapers. Results are calculated based on Table 8.

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 *et al.* (2011), who find that in the United States, opposition newspapers focus more on unemployment when unemployment is high.

Possible Concerns and Robustness Checks

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. In 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 A6 and Figure A2 in Appendix A3, which replicates the main results of sections “The Tone of Coverage” and “The Frequency of Coverage (Negativity Bias)”, with the difference, of course, that we are looking for ideological bias in congressional speech. For growth and unemployment change, 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 regardless of the level of unemployment change. For inflation change, we have marginal evidence of partisan differences — matched Senators appear to speak more favorably of inflation relative to unmatched Senators when inflation change 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 newspaper 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 A7 and Figure A3 in Appendix A3. Our results are 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 results are consistent with Figure 3, but the ideological variables are not individually or jointly significant.

Readers may not fully read longer articles. A journalist, cognizant of this fact and motivated to frame the news, may lead with information favorable to his preferred party and may bury information favorable to the other parties. The analysis of headlines we already performed provides a sharper contrast in

that the headline is particularly likely to be read relative to any other part of the article, but there are reasons to separately consider the beginnings of articles. The headline may be written by someone other than the author of the article. In addition, there is more measurement error in sentiment and coverage in headlines due to the fewer sentence fragments they are made up of. We separately investigate the beginnings of articles by replicating the first three columns of Tables 7 and 8 on the first 1000 words of articles. The results are given in Table A8 and Figure A4 in Appendix A3. We continue to find similar patterns — that is, we find no evidence of differences in sentiment between matched and unmatched papers and we find no evidence of different patterns of coverage between matched and unmatched papers.

Another concern is the binary nature of our measures of newspaper and prime minister ideology. To address this, we coded the 32 newspapers in our sample on a 5-point ideology scale based on various online sources. The scale is reported in Table A10 in Appendix A3. 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 *et al.*, 2011). The results are presented in Table A9 in Appendix A3. 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 A11 in Appendix A3 reports the result of a Wald test for whether the Ideological Match and its 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.

In many of the analyses we performed, we clustered the standard errors by newspaper. Cameron and Miller (2015) argue that between 20 and 50 clusters are sufficient for hypotheses tests based on a cluster-robust variance matrix to have proper size. As we have 32 newspapers in our sample, over-rejection is not a particularly strong concern, but we nonetheless follow Cameron and Miller (2015) and employ the wild bootstrap to compute p -values. In Tables A12, A13, A14 and A15, we replicate the results of Tables 3, A5, 7, and 8 using the wild bootstrap to compute p -values. The main conclusions of our

analysis remain the same, though in a few cases, coefficients drop in statistical significance.

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 logit models where the dependent variable was a binary indicator for whether the economic article reflected positive sentiment (relative to negative sentiment) for growth, unemployment, and inflation.¹² In the second, we estimated logit models where the dependent variable was a binary indicator for whether the economic article was coded as relating to growth, unemployment, or inflation. The results are presented in Table A16 and Figure A5, which replicate the analyses in Tables 7 and 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 ideological 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 in 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.

¹²In the analyses, we dropped articles where the sentiment was coded as neutral. We found similar results applying an ordered logit model to a 5-point scale.

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 newspaper reporting on the economy is relatively accurate and ideologically unbiased.

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