

Good news and bad news: evidence of media bias in unemployment reports

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Abstract This study employs information obtained from media content analyses, as well as economic and political data, to investigate negativity in unemployment news between 2001 and 2010 in Germany. The data indicate a substantial bias in terms of the amounts of negative and positive reports, compared with the actual development of unemployment. Moreover, the media tend to place negative unemployment reports more prominently than positive ones. The estimates suggest that the bias is not the consequence of journalists asymmetrically interpreting the official unemployment numbers. Instead, it is associated with the exploitation of often non-economic information and structural influences in the process of news production.

Keywords Unemployment · News media · Information transmission · Negativity

JEL Classification C31 · D82 · D83 · H00 · H40

1 Introduction

Information as an economic good is usually characterized by high fixed and near-zero variable costs. Acquiring and editing information is often associated with relatively high “first-copy” costs, whereas once available and prepared, pieces of information can be disseminated and shared with others in a relatively cheap way. In addition, the consumption of information is often non-rivalrous. These imperfections imply that the government has to collect and provide information in some situations, because there would be no or insufficient private supply. For example, the government collects data on the nation’s unemployment rate and provides corresponding information through press releases or homepages. News media then disseminate the information, because it usually is too

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expensive or inconvenient for individuals to obtain the data from their primary sources. Although the intermediation helps to reduce transaction costs, it entails risks. Because news media have own interests, information might not be transmitted accurately.

Due to the high political relevance of the unemployment rate, related news coverage can have crucial effects on elections (MacKuen et al. 1992; Hetherington 1996; Nadeau et al. 1999; Easaw 2010). Moreover, investigating news about unemployment is important from an economic point of view, because the coverage affects key economic variables, such as consumption, saving, investment, or stock returns through its influence on people's perceptions of job security and unemployment expectations (Mutz 1992; Brosius and Weimann 1995; Carroll 2003; Curtin 2003; Birz and Lott 2011).

Previous research into unemployment news is usually based on the assumption that positive and negative changes in the unemployment rate have symmetric effects on news output (Behr and Iyengar 1985; Harrington 1989; Hagen 2005; Lott and Hassett 2013). However, this assumption seems too restrictive, because news about the economy tends to be disproportionately negative (e.g., Kepplinger 2000; Hester and Gibson 2003). Only Soroka (2006) tests for asymmetric effects in the responses of news coverage to economic developments and finds that the media are more likely to report on rises than on falls in unemployment.

Because previous studies are based exclusively on evidence from aggregated time series, the sources and characteristics for this asymmetry remain empirically unknown. For example, it is not clear whether the reporting bias occurs because journalists misperceive or incorrectly evaluate the objective data or because they employ further, indirect information, such as the political context. To address this research gap, the current study employs a dataset that covers all of the economic reports of six leading German news outlets in the period from 2001 to 2010. The data contain detailed information about the characteristics of each individual article or television segment. Merged with economic and political variables, this information offers insights into how unemployment news coverage is determined and possibly biased. Because the economy, politics, and media reports are highly interdependent, the research design of this study does not support determining whether a reporting bias originates in the demand or supply side of the news market. However, this study's cross-sectional approach allows investigating reporting biases in greater detail than would be possible with time series. This involves the evaluation of a very prominent type of bias, which refers to a situation in which media report more negatively about unemployment than actual developments suggest, such as when an increase in the unemployment rate by 1 percentage point induces more negative reports than an equivalent decrease causes positive ones. In addition, the research design supports the identification of volume bias. Even if there is no negativity bias, the actual intensity of unemployment news might differ among media outlets, over time, or both. Finally, it is possible that unemployment news coverage is biased in qualitative terms, for instance regarding the placement of reports or the sources referenced.

The next section discusses explanations for bias in unemployment news, followed by a description of the data. The article concludes with a discussion of the implications.

2 Theoretical background

Owing to the nature and relevance of related information, news media tend to cover the release of official unemployment statistics regularly and almost obediently. As a rule of thumb, the press releases might be shortened, but otherwise tend to be reported without

further editing; thus the media usually simply recites the official information (Neuman 1990; Corner 1998; Goddard et al. 1998). The official unemployment numbers, which are published on a monthly basis by the Federal Employment Agency (FEA) in Germany, are thus the main determinant of unemployment news coverage.¹ Explanations for deviations from this basic assumption are discussed next.

2.1 Cognitive limitations of journalists

A reporting bias might reflect cognitive limitations of journalists. Similar to media consumers, journalists are subject to psychological mechanisms that lead to distorted perceptions and information processing. For example, the impression formation literature suggests that in many contexts, negative or unfavorable information has greater and more sustained effects than positive or favorable information (see Cacioppo and Gardner 1999; Baumeister et al. 2001; and Rozin and Royzman 2001 for reviews). In the economics literature, prospect theory (Kahneman and Tversky 1979) suggests stronger effects of negative information because decision-making processes are influenced by loss aversion and endowment effects. Therefore, journalists might respond differently to favorable and unfavorable changes in economic variables (Kahneman et al. 1991; Tversky and Kahneman 1991). In addition, economics is often mathematical and complex, which might lead to inaccuracies if journalists work under time pressures or without sufficient training in economic analysis.

2.2 Interests of journalists, editors, and owners

The political dimension of unemployment might imply that the ideological preferences or other interests of journalists, editors, and owners of media companies cause deviations of the news coverage from actual developments. Patterson and Donsbach (1996) present evidence that journalists' self-reported political attitudes correlate with their selections and framing of the content of stories and headlines. According to a comprehensive survey conducted by the American Society of News Editors (Urban 1999), many journalists admit that certain circumstances can lead to reporting inaccuracies. For example, bias can occur in news related to political issues, such that certain people or groups may receive more (or less) favorable coverage than others. Groseclose and Milyo (2005) also find indications of political biases in US media outlets, through their analyses of citations of think tanks and political groups. The findings of Lott and Hassett (2013) suggest that US newspapers publish more positive reports about economic variables during Democratic presidencies than during Republican ones. Such empirical observations are investigated further using formal models of news markets. For example, Bovitz et al. (2002) employ a game-theoretic approach to model the conditions that allow media elites to achieve ideological goals. Besley and Prat (2006) argue that political bias might emerge when media companies benefit from collaboration with the government in the form, for example, of better access to public officials, friendly administrative decisions or beneficial legislative interventions.

Andina-Díaz (2007) and Gasper (2009) show that it can be profitable for media outlets to influence their audiences by differentiating coverage and presentation. In this regard, a reporting bias might result from media companies' efforts to increase the demand for their

¹ Note that government unemployment statistics are merely estimates of the "true" unemployment rate insofar as they are based on statistical sampling techniques and usually are corrected or adjusted at least once after they are first made public.

products by catering to preferences and attitudes of their viewers and readers. As Mul-lainathan and Shleifer (2005) and Gentzkow and Shapiro (2006, 2010) argue, recipients usually perceive news coverage as inaccurate if the reports deviate from their prior beliefs. Because a reputation for accuracy offers a means to expand the demand for their products, media companies have an incentive to produce reports that correspond with the prior beliefs of potential consumers.

Accordingly, biased news coverage can be considered as the outcome of concentrated benefits and dispersed costs (Olson 1965). If media companies actually profit from biasing news coverage towards the beliefs of their audiences, benefits are conferred on a relatively small group. However, the potential consequences of biased news coverage, such as distorted economic perceptions/expectations and the associated loss in macroeconomic efficiency, constitute dispersed costs for a much bigger group. Media companies therefore have strong incentives to influence public policy towards securing their freedom to report, whereas media consumers have only small incentives to lobby for more regulation in news coverage.

2.3 Role of media in democracies

An even stronger argument for negative news coverage is the mass media's role in democratic societies. Because information on general economic conditions is somewhat of an impure public good, it has to be provided by the government in many cases, which leads to a principal-agent relationship between the government and the public. If the government has incentives to collect but not to share information, the relationship is characterized by asymmetric information. News media are able to alleviate the principal-agent problem by critically monitoring elected representatives. Accordingly, the news media are often referred to as the Fourth Estate (Schultz 1998; Manning 2001). As in Germany, the freedom of press is granted by the constitutions of many countries. A reporting bias therefore could result from critical news coverage that is caused by media holding representatives, governments, and other institutions responsible for their actions.²

3 Data and descriptive statistics

To evaluate the determinants of unemployment news coverage and potential biases, this study combines data about news coverage, actual economic conditions, and the political context for the time from 2001 to 2010 in Germany.

3.1 News coverage

The media data used in this study are provided by Media Tenor International, a media research institute that gathers detailed information about print articles and television segments by analyzing the contents of newspapers, news magazines, and news broadcasts; see <http://www.mediatenor.com> for details. The analyses are conducted by professionally trained experts who follow consistent instructions documented in codebooks and achieve

² News media also can “go easy” on the government, for example when policies comport with the political preferences of journalists..

high inter-coder reliability and validity. The dataset used in this study covers all economic news reports³ between 2001 and 2010 in the following leading German media outlets:

The newscast *Tagesschau*, aired daily at 8:00 p.m. on the largest public service broadcaster ARD ('Consortium of Public-Law Broadcasting Institutions of the Federal Republic of Germany'). According to its average audience reach of 8.86 million viewers in 2009, it is the most important German news broadcast.

The second most important news show, *Heute*, which airs daily at 7:00 p.m. through the public service broadcaster ZDF ('Second German Television'), reached an average of 4.02 million viewers in 2009.

The most important privately produced newscast, *RTL Aktuell*, airs daily at 6:45 p.m. on the commercial broadcast RTL Television. Its 2009 average audience amounted to 3.79 million viewers.

The national daily tabloid *Bild* is published by one of Europe's largest multimedia companies (Axel Springer AG), from Monday to Saturday, with an average daily reach of 3.19 million readers in 2009.

Der Spiegel (Spiegel Publishing) is Germany's most influential weekly news magazine. On average, the magazine reached 1.05 million readers per week in 2009.

With an average weekly reach of 0.64 million readers in 2009, *Focus* is another leading weekly news magazine in Germany, published by Hubert Burda Media.

Of course, this sample is only a selection of national print and television outlets and does not include regional or online media. Therefore, it might not be representative of the overall news output in Germany in a strictly statistical sense. However, the German news market is rather concentrated, media companies are often interlocked, and online news portals are often subsidiaries of print or television media and rely on the same content production (Die Landesmedienanstalten 2007). The selection therefore matches the purpose of this study, in that it approximates the news the public receives.

The sample contains information about 27,248 print articles and television segments, referring to 36,026 reports (i.e., single articles and television segments sometimes address multiple topics). As a first step, this study identifies all reports about either rising or falling unemployment that refer to Germany as a whole. Unemployment reports with an international or regional perspective are not counted, because the economic and political data used to explain the news coverage also refer to Germany as a whole. With this restriction, the sample contains 620 reports about increasing and 477 reports about decreasing unemployment, or a ratio between negative and positive news of 1.3 to 1.

In addition to news content, this study uses information about the reports' characteristics to evaluate whether negative and positive news differ not only in quantitative terms but also qualitatively. Table 1 provides the corresponding descriptive statistics. A binary variable first indicates if a report is the lead story of a newspaper, news magazine, or newscast. The numbers indicate that almost 10 % of the reports in the sample are classified as lead stories. However, this share jumps to approximately 21 % for unemployment news, which highlights the importance that the media attach to this topic compared with other economic issues. Moreover, all reports are consecutively numbered within an issue (i.e., for print media, from left to right and then from top to bottom; chronologically for newscasts). Ranging from 1 to 30, this variable suggests that at first sight, there are no substantial differences across news

³ The sample contains information about every article and television segment that provides economic news (e.g., reports about economic conditions, economic policy, industries, companies, or unions), excluding articles from the financial or stock section, press reviews, letters by readers, and notes from the publisher.

categories. To capture the source of news, a dummy variable set indicates whether a report is based on information obtained from an institution (e.g., government, company, organization), a person (e.g., politician, manager, scientist, celebrity), or the FEA. The category ‘journalist’ captures reports that are not based on an explicit source, as is the case for about 48 % of the reports in the full sample. Comparing both types of unemployment news reveals interesting differences. Reports about declining unemployment are based on the FEA in almost 25 % of the cases, but only 18 % of the reports about rising unemployment come from this source. In contrast, reports about increasing unemployment tend to lack an explicit source (53 %, compared with 48 % for news about decreasing unemployment). Apparently, journalists use other or additional information to produce reports about increasing unemployment more often than in the case of decreasing unemployment. Another dummy variable set indicates whether reports relate to the present, future, or past. A report containing a description of the future that is bound to certain conditions is classified as a conjecture. In this regard, the majority of economic news (84 %) relates to the present, and whereas for negative unemployment news this share is slightly larger at 86 %, it is slightly lower for news about decreasing unemployment (82 %). This latter sort of news instead relates more often to the past or involves conjectures.

A final dummy variable set captures differences between media outlets. As Table 2 shows, the overall propensity to report about unemployment—measured as a share of total economic news coverage—ranges from 1.14 % (*Focus*) to 4.75 % (*Bild*). In addition, the ratio of news about increasing to decreasing unemployment differs across sources, such that it is almost balanced for the newscast *Heute* (1.02 to 1) but amounts to 2 to 1 for the news magazine *Der Spiegel*. Overall, the ratio tends to be larger for the print media in the sample than for the newscasts. However, the number of media outlets considered in this study is too small to draw general conclusions about differences between print and television news. For the same reason, it remains unclear whether there are systematic differences between private and public media.

3.2 Economic variables

As discussed previously, the official unemployment numbers released by the FEA are the main determinant of unemployment news. At the beginning of each month, the FEA releases the numbers for the last month at a well-publicized press conference. This publication lag is accounted for by using the monthly change in the unemployment rate, in addition to the current rate. Moreover, this study uses quarterly and annual changes, because journalists might also exploit longer-term trends in unemployment. Because the FEA releases include seasonally adjusted and unadjusted numbers, both are tested alternately in the models. Following Harrington (1989), a binary variable serves to check for differences in that part of the news coverage that is not based on immediate information about unemployment developments; it takes a value of 1 for reports published or broadcasted in months with no monthly, quarterly, or yearly changes in the unemployment rate, and 0 otherwise.

Figure 1 shows the monthly changes in the seasonally adjusted unemployment rate from 2001 to 2010. Overall, there were more decreases (sum = -6.1 percentage points) in the unemployment rate than increases (sum = 4.2 percentage points).⁴ Comparing this ratio of negative to positive changes (0.68 to 1) with the ratio of negative to positive reports

⁴ The seasonally unadjusted unemployment rate, as well as quarterly and annual changes, lead to very similar ratios. However, it is preferable to show the seasonally adjusted data in Figs. 1 and 2, because the seasonal pattern would make it more difficult to quickly recognize the overall trend.

Table 1 Report characteristics

| | Full sample | News about unemployment | |
|-----------------------------|-------------|-------------------------|------------|
| | | Increasing | Decreasing |
| Placement | | | |
| Lead story (%) | 9.84 | 21.45 | 20.75 |
| Number of appearance (mean) | 5.69 | 5.94 | 5.86 |
| Source (%) | | | |
| Institution | 25.46 | 14.19 | 12.16 |
| Person | 24.46 | 14.68 | 15.30 |
| FEA | 1.68 | 17.90 | 24.74 |
| Journalist | 48.40 | 53.23 | 47.80 |
| Reference to time (%) | | | |
| Present | 84.29 | 86.29 | 81.97 |
| Future | 6.02 | 10.00 | 9.85 |
| Past | 3.53 | 1.94 | 5.24 |
| Conjecture | 6.16 | 1.77 | 2.94 |

Table 2 Differences across media outlets

| | Reports about unempl. (% of the full sample) | Ratio of neg. to pos. unemployment news |
|-------------|---|--|
| Bild | 4.75 | 1.50 |
| RTL Aktuell | 4.39 | 1.16 |
| Tagesschau | 2.64 | 1.13 |
| Heute | 2.63 | 1.02 |
| Focus | 1.14 | 1.81 |
| Der Spiegel | 1.96 | 2.00 |

(1.3 to 1) shows that the news coverage was clearly more negative than the actual numbers would suggest. This impression is supported by Fig. 2, which depicts the development of the unemployment rate and the corresponding linear trend. On average, the unemployment rate declined in the period under consideration, while the media favored reports about increasing unemployment.

Other information about the economy might also prompt journalists to report about unemployment, perhaps on the basis of deductions from the economy's general performance. The monthly production index serves as a proxy for this variable, because data about the gross domestic product are available only on a quarterly basis in Germany. The production index is based on surveys conducted by the Federal Statistical Office and published by the Ministry of Finance. As in the case of the unemployment data, the estimations include the index itself, as well as its monthly, quarterly, and yearly changes, in either seasonally adjusted or unadjusted form.

3.3 Political variables

To capture political influences, this study uses a dummy variable set to account for different government administrations in the period under consideration. Following the finding

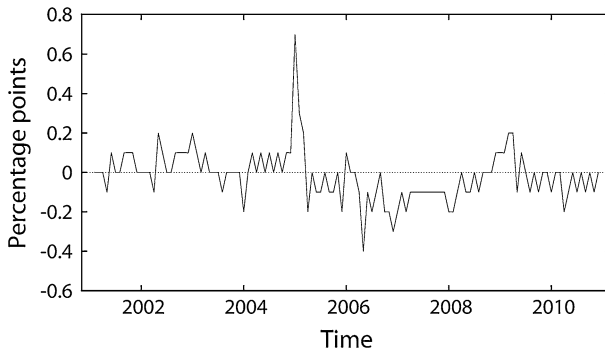


Fig. 1 Monthly changes in the unemployment rate. *Source* FEA

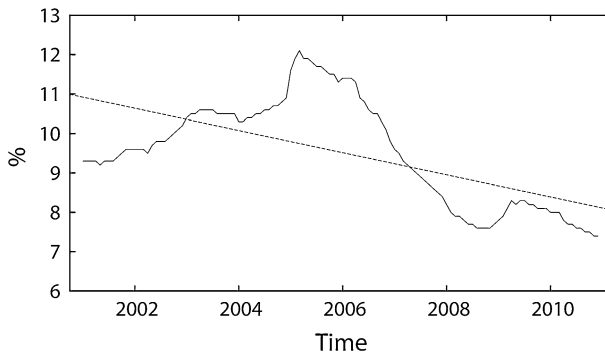


Fig. 2 Overall trend in the unemployment rate. *Source* FEA

that economic news coverage may differ in election periods (Harrington 1989; Goidel and Langley 1995), a binary variable is constructed that takes the value 1 in months with elections to the German parliament and 0 otherwise. Another binary variable takes the value 1 for reports published in August 2002, to account for the release of the so-called Hartz commission report, which was the basis for the most comprehensive labor market reforms in Germany's post-war history and initiated an extensive public debate.

4 Method and results

Logistic regression serves to estimate how the probability, that a report contains unemployment news, is determined. This regression can be written as:

$$y = \alpha + \beta_1 X_{\text{char}} + \beta_2 X_{\text{econ}} + \beta_3 X_{\text{pol}} + \beta_4 D_{\text{outlet}} + \varepsilon, \quad (1)$$

where y denotes the binary dependent variable. The vectors X_{char} , X_{econ} , and X_{pol} , respectively, contain the report characteristics and the economic and political variables described in the previous section. Although the explanatory variables often contain temporal information, the equation cannot be estimated as a (true) panel model, because there are many dates with either no or multiple reports, so that a time variable would not

uniquely identify the observations. However, the vector D_{outlet} contains a dummy variable set to control for unobserved media-specific differences. Seasonal or year dummies are not included, because most of the information such dummies would provide already is contained in the economic variables, leading to likely problems with multicollinearity. The errors ε are assumed to be independent and logistically distributed.

4.1 Determinants of unemployment news

Because the dataset employed in this study covers all economic reports, it can be used to evaluate the factors that cause the media to report about unemployment, instead of other economic topics. Estimating the model separately for negative and positive unemployment news, respectively, allows for a comparison of the determinants of both types of reports, which provides initial insights about reporting biases.

Table 3 shows the estimated marginal effects and p-values for the two specifications.⁵ The coefficients of the report characteristics must be interpreted according to reverse causality: A report does not relate to unemployment because it is characterized in a certain way, but the topic might influence the report characteristics. In this regard, the estimates emphasize the prominence of unemployment news in comparison with general economic reporting, in that unemployment reports are more likely to be lead stories and tend to be placed more prominently in newspapers, news magazines, or newscasts. Reports that use the FEA as a source refer more often to unemployment than to other economic topics. In contrast, unemployment reports cite other institutions or persons less often. Moreover, these reports refer to the future more often, though without offering more conjectures.

The influence of the unemployment variables is of primary interest. Periods with a high unemployment rate are not associated with a significantly greater probability of publishing unemployment news. Apparently, unemployment reports do not depend on the level of, but changes in the unemployment rate: news about increasing unemployment becomes more probable when the unemployment rate has increased since the previous month, quarter, and year. Conversely, reports about decreasing unemployment are more likely when the unemployment rate falls. However, in this case only quarterly and yearly (but not monthly) changes have a significant impact. Monthly decreases in the unemployment rate might be less newsworthy than changes over longer time horizons.

In months with no changes in the unemployment rate the coefficients indicate a significantly larger probability of negative unemployment news. This finding is not surprising because news media often publish reports that anticipate changes in the unemployment rate prior to the official announcement, for example by citing experts or economic research institutes. Sometimes reports also discuss developments in retrospect. However, it is surprising that for reports about decreasing unemployment, the coefficient estimate suggests the opposite effect: positive reports become less probable in months with no changes in the

⁵ The model diagnostics support a statistical comparison of the estimates with and without seasonally adjusted data. In general, all specifications are satisfactory, as the link tests indicate. However, the Akaike and Bayesian information criteria and McFadden's R^2 suggest that the specifications with seasonally unadjusted unemployment and industrial production data provide a better model fit than the specifications with adjusted data (this result holds when conducting the test comparing only the unemployment rate or industrial production). The seasonally unadjusted data generally exhibit greater variation and thus provide more information to explain the dependent variables. However, this result also might be an indication that the seasonally unadjusted numbers are more important for journalists, maybe because they appear to be more impressive and thus more newsworthy. In line with this finding, the presentation of results refers to the estimates with seasonally unadjusted data only.

Table 3 Estimation results (full sample)

| | Increasing unemployment | | Decreasing unemployment | |
|-------------------------------------|-------------------------|---------|-------------------------|---------|
| Report characteristics | | | | |
| Lead story | 0.0055 | (0.000) | 0.0051 | (0.000) |
| Number of appearance | −0.0003 | (0.000) | −0.0003 | (0.000) |
| Source (ref.:journalist) | | | | |
| Institution | −0.0044 | (0.000) | −0.0042 | (0.000) |
| Person | −0.0038 | (0.000) | −0.0019 | (0.009) |
| FEA | 0.0128 | (0.000) | 0.0151 | (0.000) |
| Time (ref.:present) | | | | |
| Future | 0.0031 | (0.000) | 0.0027 | (0.003) |
| Past | −0.0017 | (0.311) | 0.0011 | (0.343) |
| Conjecture | −0.0062 | (0.000) | −0.0028 | (0.055) |
| Economic variables | | | | |
| Unemployment rate | 0.0000 | (0.961) | 0.0009 | (0.121) |
| Unemployment rate Δ1 | 0.0016 | (0.066) | −0.0010 | (0.473) |
| Unemployment rate Δ3 | 0.0022 | (0.000) | −0.0019 | (0.002) |
| Unemployment rate Δ12 | 0.0030 | (0.000) | −0.0012 | (0.050) |
| No change unemployment | 0.0012 | (0.039) | −0.0016 | (0.030) |
| Industrial production | −0.0156 | (0.039) | 0.0200 | (0.039) |
| Industrial production Δ1 | −0.0004 | (0.939) | −0.0130 | (0.015) |
| Industrial production Δ3 | −0.0023 | (0.621) | −0.0018 | (0.708) |
| Industrial production Δ12 | −0.0066 | (0.334) | 0.0368 | (0.000) |
| Political variables | | | | |
| Cabinet (ref.: Merkel II) | | | | |
| Schröder I | 0.0081 | (0.000) | 0.0086 | (0.000) |
| Schröder II | 0.0049 | (0.001) | 0.0019 | (0.272) |
| Merkel I | 0.0002 | (0.918) | 0.0016 | (0.478) |
| Election | 0.0030 | (0.059) | 0.0088 | (0.000) |
| Publication of Hartz commission | 0.0040 | (0.010) | −0.0011 | (0.735) |
| Media-specific differences | | | | |
| Media outlet (ref.: Tagesschau) | | | | |
| Bild | −0.0002 | (0.777) | −0.0008 | (0.350) |
| RTL Aktuell | 0.0021 | (0.011) | 0.0022 | (0.009) |
| Heute | −0.0004 | (0.624) | 0.0007 | (0.361) |
| Focus | −0.0056 | (0.000) | −0.0075 | (0.000) |
| Der Spiegel | −0.0038 | (0.000) | −0.0061 | (0.000) |
| Model diagnostics | | | | |
| | s.a.: no/yes | | s.a.: no/yes | |
| Link test | (0.370)/(0.819) | | (0.391)/(0.868) | |
| McFadden's R ² | 0.225/0.212 | | 0.188/0.182 | |
| McKelvey & Zavoina's R ² | 0.433/0.442 | | 0.390/0.376 | |
| Count R ² | 0.983/0.983 | | 0.987/0.987 | |
| AIC | 4910/4992 | | 4176/4208 | |
| BIC | −1130/−1048 | | −669/−638 | |

Logit estimates (marginal effects) are based on 36,026 economic reports. The dependent variable takes the value of 1 if a report is about increasing or decreasing unemployment, respectively, and 0 for other economic news. All models contain an intercept (output omitted). *P* values are given in parentheses. The link test refers to the significance of the squared predicted values in the test equation

unemployment rate. This difference between negative and positive reports implies that news about declining unemployment tends to stick to the timing of official announcements, whereas the news media allow themselves more freedom to report about increasing unemployment.

The general performance of the German economy also affects the likelihood of unemployment news. High levels of the production index are associated with a smaller chance of negative and a larger probability of positive unemployment reports. Monthly, quarterly, and yearly changes in the production index do not significantly affect the likelihood of negative unemployment news. However, news about declining unemployment becomes less likely when industrial production increased since the previous month, and more likely when the index increased compared to 12 months ago. In the case of monthly changes, positive, general economic news might crowd out news about falling unemployment; in the case of yearly changes, however, journalists might infer that positive economic news causes unemployment to fall.

Political influences matter, over and above economic factors, and especially for negative unemployment news. During the first Schröder cabinet news about changes in unemployment in both directions were more likely to be reported. In contrast, during the second Schröder cabinet, news about increasing, but not decreasing unemployment was more likely. Both positive and negative reports occurred more often in months with elections to the German parliament, which also emphasizes the political salience of the unemployment numbers. Moreover, the publication of the report of the Hartz commission was associated with additional negative unemployment news.

Finally, the propensity to report about unemployment varies across media outlets, such that it is generally stronger for the newscast *RTL Aktuell* but weaker for the news magazines *Focus* and *Der Spiegel*. These differences cannot be interpreted as differences between media types (e.g., print versus television), because the coefficients relate to the probability of unemployment news relative to other economic news. Therefore, the differences reflect the preferences or interests of the outlets' journalists, editors, and owners.

4.2 Tests for symmetry in media reactions

The estimates presented thus far indicate that the sources of unemployment news coverage include not only changes in the official unemployment rate but also other, external information providers. These additional sources appear to contribute to the reporting bias. However, it is not clear whether the news coverage is also biased by different media reactions to negative and positive changes in the unemployment rate. For the various reasons discussed in the theory section, it is possible that increases in the unemployment rate cause more negative reports than decreases prompt positive ones. This conjecture can be evaluated using the Wald tests for cross-model comparison suggested by Liao (2004), which involves summing the relevant coefficients across models and testing whether the sum equals 0, conditional on all controlled-for factors.

Table 4 summarizes the results of these tests. For monthly, quarterly, and annual changes in the unemployment rate, the sum does not significantly differ from 0. The actual unemployment numbers thus are not asymmetrically interpreted by the media but accurately used to produce news.

Table 4 Tests for symmetry in media reactions

| | \sum m.e. | $\chi^2(1)$ test statistic | <i>p</i> value |
|-------------------------------|-------------|----------------------------|----------------|
| Unemployment rate $\Delta 1$ | 0.0007 | 0.006 | (0.938) |
| Unemployment rate $\Delta 3$ | 0.0003 | 0.008 | (0.929) |
| Unemployment rate $\Delta 12$ | 0.0017 | 0.313 | (0.576) |

The Wald tests refer to the null hypothesis that the marginal effects of changes in the unemployment rate sum up to 0 across the models for news about increasing and decreasing unemployment

4.3 Characteristics of reporting biases

To find out how the information that journalists use in addition to the official unemployment numbers affects reporting biases, it is useful to restrict the sample and consider news about unemployment exclusively. This restriction allows estimating the probability of news about increasing versus decreasing unemployment.⁶ If news coverage only and accurately reflects actual developments, no variables other than those referring to unemployment would be statistically significant. However, as Table 5 indicates, several other coefficients are significantly different from 0. Regarding the report characteristics, reports about increasing unemployment tend to appear more prominently and less often cite named persons as sources. In months with no change in the unemployment rate, negative unemployment news becomes significantly more likely—maybe because bad news sells better than no news. Conversely, news about decreasing unemployment is less probable in these months. Again, this is an indication that the media tend to follow the timing of the official announcements more closely when the unemployment rate fell, whereas news about increases in the unemployment rate seems to bias news outlets in favor of reporting such changes. However, in months with elections to the German parliament, the estimates indicate a significant tendency towards positive unemployment news, a phenomenon from which incumbent politician might benefit. Finally, given all factors accounted for in the model, the tabloid *Bild*, as well as the news magazines *Focus* and *Der Spiegel*, generally are more inclined to report on increasing rather than decreasing unemployment, which implies that the preferences of their journalists, editors, or owners affect the extent of the bias in favor of bad economic news.

In general, the estimates presented thus far suggest media-specific differences in the way unemployment news is determined. It is therefore expedient to evaluate whether links exist between the political orientation of individual media outlets, their news coverage, and the government in office. For that purpose, Eq. (1) is estimated separately for each media outlet in the sample, in which case the coefficients of the government dummies indicate whether the news coverage of individual outlets changed in response to changes in governing parties or governing coalitions.

Table 6 summarizes the results of these estimations. The first two columns refer to the link between specific cabinets and the probability of news about increasing and decreasing unemployment versus other economic news, whereas the third column indicates whether governments affect the probability of news about increasing versus decreasing unemployment. Accordingly, the tabloid *Bild* was significantly more likely to report about

⁶ The model specification is satisfactory when using seasonally unadjusted data. The different R^2 measures and information criteria consistently indicate that specifying the model with seasonally adjusted data would reduce the model's fit. Therefore, only the results based on the unadjusted data are presented.

Table 5 Estimation results (restricted sample)

| | Increasing versus decreasing | |
|-----------------------------------|------------------------------|---------|
| Report characteristics | | |
| Lead story | −0.0482 | (0.550) |
| Number of appearance | −0.0111 | (0.039) |
| Source (ref.: journalist) | | |
| Institution | −0.0335 | (0.634) |
| Person | −0.1381 | (0.055) |
| FEA | −0.0752 | (0.235) |
| Time (ref.: present) | | |
| Future | −0.0245 | (0.763) |
| Past | −0.1378 | (0.338) |
| Conjecture | −0.0936 | (0.524) |
| Economic variables | | |
| Unemployment rate | −0.0341 | (0.431) |
| Unemployment rate $\Delta 1$ | 0.2908 | (0.006) |
| Unemployment rate $\Delta 3$ | 0.1999 | (0.000) |
| Unemployment rate $\Delta 12$ | 0.1050 | (0.089) |
| No change unemployment | 0.2107 | (0.001) |
| Industrial production | −2.5100 | (0.001) |
| Industrial production $\Delta 1$ | 1.4894 | (0.003) |
| Industrial production $\Delta 3$ | −0.1039 | (0.823) |
| Industrial production $\Delta 12$ | −3.1351 | (0.000) |
| Political variables | | |
| Cabinet (ref.: Merkel II) | | |
| Schröder I | −0.0803 | (0.524) |
| Schröder II | 0.1968 | (0.118) |
| Merkel I | −0.0564 | (0.749) |
| Election | −0.5652 | (0.000) |
| Publication of Hartz commission | 0.2372 | (0.153) |
| Media-specific differences | | |
| Media outlet (ref.: Tagesschau) | | |
| Bild | 0.2592 | (0.002) |
| RTL Aktuell | 0.0569 | (0.465) |
| Heute | 0.0358 | (0.642) |
| Focus | 0.2631 | (0.038) |
| Der Spiegel | 0.2222 | (0.050) |
| Model diagnostics | | |
| Link test | (0.092)/0.002 | |
| McFadden's R^2 | 0.539/0.480 | |
| McKelvey & Zavoina's R^2 | 0.738/0.679 | |
| Count R^2 | 0.866/0.853 | |
| AIC | 748/837 | |
| BIC | −620/−532 | |

Logit estimates (marginal effects) are based on 1,097 reports about unemployment. The dependent variable takes the value of 1 if a report is about increasing and 0 about decreasing unemployment. All models contain an intercept (output omitted). *P* values are given in parentheses. The link test refers to the significance of the squared predicted values in the test equation

Table 6 Links between individual media outlets and governments

| | 1 Inclination to report about | 2 Inclination to report about | 3 Inclination to report about |
|-------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Bild | Schröder I (+), Schröder II (+) | | Schröder II (+) |
| RTL Aktuell | Schröder I (+) | Schröder I (+) | |
| Tagesschau | Schröder I (+), Schröder II (+) | Schröder I (+), Schröder II (+) | |
| Heute | Schröder I (+) | Schröder I (–) | |
| Focus | Schröder I (+) | Schröder I (+) | |
| Der Spiegel | Merkel I (–) | Schröder II (–) | |

The results are obtained by using Eq. (1). The reference category is Merkel II. Columns 1 and 2 summarize media-specific estimates using the unrestricted sample described in Sect. 4.1, whereas column 3 refers to the restricted sample used in Sect. 4.3. The cells contain the name of the cabinet if the coefficient of the corresponding dummy variable is at least significant at the 10 % level; the sign of a significant coefficient is provided in parentheses

increasing unemployment (versus other economic news) during the two Schröder cabinets than during the cabinets Merkel I and II. Of course, Gerhard Schröder governed in times of higher unemployment than Angela Merkel, but this and other factors have been controlled for. In turn, reports about falling unemployment (versus other economic news) were not affected by the government in office. This asymmetry is confirmed in the third column, at least with respect to the time of the second Schröder cabinet. Here, *Bild* was inclined to favor reports about increasing unemployment as opposed to positive ones. This negativity bias corresponds to the overall economic policy stance of the *Bild*. The tabloid has a reputation for being rather business friendly and close to the conservative Christian Democratic Union, which political orientation differs in many points from that of the Social Democratic Party and Gerhard Schröder. The newscasts *RTL Aktuell*, *Tagesschau*, and *Heute*, as well as the news magazine *Focus*, also were significantly more likely to report more about increasing unemployment (versus other economic news) during the first Schröder cabinet, the second one, or both. However, since these outlets had a similar inclination to report about decreasing unemployment in this period, it is a bias in the volume of unemployment news but not in its tone. This finding is consistent with the political orientation of these outlets: *RTL Aktuell* is a part of Bertelsmann, a major international media company with the declared intention of being politically neutral; both *Tagesschau* and *Heute* are public service broadcasts; the news magazine *Focus* usually highlights topics with particular user value and does not have a strong partisan orientation. Finally, *Der Spiegel* reported significantly less often about rising unemployment during the first Merkel cabinet (a coalition of Christian Democrats and Social Democrats). In addition, in the time of the second Schröder cabinet, the magazine was less inclined to report about falling unemployment. This pattern is plausible, because *Der Spiegel* has the reputation for being economically liberal, so that the magazine is closer to the Christian Democrats than to the Social Democrats.

4.4 Robustness

A major concern could be that the results in this study are affected by the efforts of the media to cater to the preferences of their consumers. A first robustness check thus involves re-estimating the models with additional variables that capture the public's unemployment

expectations as surveyed by the European Business and Consumer Surveys. A further check examines whether the results change when measures of inflation substitute for the index of industrial production. Moreover, the robustness is evaluated by excluding reports from the years 2008 to 2010 from the sample, with the consideration that the global economic crisis might have had influenced the news coverage. Finally, another robustness check models the residual variance as a function of time, thus allowing for heteroscedastic errors (Williams 2009). The alternative specifications are applied to all three parts of the empirical section. The results do not indicate substantial deviations from the baseline specifications. Details are available on request.

5 Conclusion

Under optimal conditions, news media are supposed to improve the economic efficiency of markets and political processes, by reducing information and cognitive costs. However, the transmission of biased information implies that actual practice deviates from this ideal. To investigate how unemployment news coverage in Germany is determined and biased, this study employs economic and political data, as well as information obtained from analyzing six leading media outlets. In the period from 2001 to 2010, unemployment news was determined by both economic and non-economic factors. The ratio between news about rising and falling unemployment amounted to 1.3 to 1, whereas the ratio for actual changes in the unemployment rate was 0.7 to 1. This reporting bias was not the result of journalists misinterpreting the official unemployment statistics, because negative and positive changes in the unemployment rate caused equal numbers of negative and positive reports, after controlling for non-economic factors and other sources of information. However, the estimates indicate a significantly larger probability of negative unemployment news when the unemployment rate did not change, whereas positive reports were less likely in this situation. Apparently, journalists report about increasing (but not decreasing) unemployment without needing immediate reasons for doing so, maybe owing to the availability of other information, maybe because bad news sells better than no news. Moreover, the bias had not just a quantitative but also a qualitative dimension, because negative reports tended to be placed more prominently within newspapers, news magazines, and newscasts. Finally, the propensity to report more about increasing than decreasing unemployment varied across media outlets, which suggests that the personal preferences of news producers had an impact on the extent of the bias. Comparing the news output of individual media with the governing parties suggests that at least a part of these differences can be attributed to the political orientation of the outlets.

However, the research design of this study does not allow one to determine whether the biases originated on the supply or on the demand side of the news market. It remains unclear, for instance, the degree to which the political orientation of a media outlet is determined by the owners, editors, or journalists, and the degree to which it is influenced by the outlet catering to the preferences of its audience or advertising clients. In addition, the findings are limited to the data-specific context of this study. Accordingly, further research is necessary to evaluate whether the results would be similar for other countries, eras, or economic variables (e.g., growth or inflation). Yet the implications of the findings are problematic from an economic point of view, because overly negative reporting likely contributes to pessimism in the public's unemployment expectations (Dua and Smyth 1993; Tortorice 2012; Garz 2013), which in turn might affect consumption or investment behavior.

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