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Book

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Can Media Drive the Electorate? The Impact of Media Coverage on Party Affiliation and Voting Intentions♣

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Abstract

As the rise of populist and right-wing political movements is connected to extensive media coverage, the question arises whether media report more on political parties because of their success or if their success is caused by media reports. To tackle this question, we investigate how media coverage affects short- and long-term political preferences, namely *party affiliation* and *voting intention.* For our empirical analysis, we merge 14 years of human-coded data obtained from leading media in Germany with results of the comprehensive German *Politbarometer* survey from February 1998 through December 2012. To account for endogeneity, we employ probit estimations with time lag techniques as well as instrumental variable estimations. In addition, we control for a multitude of (internal) personal characteristics, such as age, and gender, as well as for (external) macroeconomic variables, such as business climate, unemployment, and inflation. The results show that media coverage of a political party has a positive and significant effect on the short-term voting intention for this party. When media outlets cover a political party more positively, the electorate has a greater tendency to vote for it. However, for long-term party affiliation, the effect vanishes. This is consistent with the economic theory. Long-term preferences are stable and, thus, contemporary events, such as media coverage, hardly affect supposedly stable preferences. However, in the long-term, party affiliation might also be affected.

Keywords: political preferences, voting intention, media impact

JEL classification: C43, D 72

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1 Introduction

Following the success of Donald Trump in the 2016 US presidential elections and the upswing of populist, right-wing, and EU-sceptic political parties and politicians in Europe, media and its role in the perception and decisions of individuals in the political context are (once again) under scrutiny. The success of Nigel Farage in the UK, Geert Wilders in the Netherlands, Marine Le Pen in France, Giuseppe Piero "Beppe" Grillo in Italy, and their respective parties, as well as the *Alternative für Deutschland* (AfD) has been accompanied by huge media interest.

This raises the question whether media report more on political parties because of their success or if their success is caused by media reports. To address this question, we investigate how media coverage affects both political sentiments and preferences. By doing so, we differentiate between the short- and long-term effects of media coverage on political preferences. Therefore, we focus on short-term *voting intentions,* on the one hand, and on long-term *party affiliation,* on the other.

In addition to the analysis of the *voting intentions,* we want to know if long-term political preferences (measured by *party affiliation*) are stable over time or if they are also influenced by media reports. While standard economic theory assumes stable preferences, some studies question this assumption (see, e.g., Meier & Sprenger, 2015; Muller et al., 2008). Kuhn (2009) analyses the stability of political, i.e. party, preferences. It turns out that party preferences are not entirely stable. They vary between different parties, but stabilise with age, the electoral cycle, socio-structural predispositions, and other variables.

For our empirical analysis, we merge 14 years of human-coded data derived from leading German media with the results of the comprehensive German *Politbarometer* survey from February 1998 through December 2012. As media coverage may not only affect the political preferences of voters, but also be generally affected by the current political mood of the electorate, it is likely that endogeneity is a problem. On the one hand, the political preferences of media consumers could impact the coverage of the specific media outlets they consume. This, for instance, would hold if a media outlet reacts to the moods of their recipients. In this case, the analysis is likely to suffer from endogeneity in terms of reverse causality. On the other hand, in the case that the media react to general political sentiments, this would result in endogeneity in terms of an omitted variable bias. To address these issues, we employ probit estimations and instrumental variables.

Moreover, we also control for a multitude of (internal) personal characteristics, such as age, and gender, as well as (external) macroeconomic variables, such as business climate, unemployment, and inflation.

Our contribution is structured as follows: Section 2 provides an overview of the related literature before the data are introduced in section 3. Then, section 4 describes our estimation strategy and presents the results. Finally, section 5 concludes.

2 Related Literature

Media play a vital role in the perception and decisions of individuals in both economic and political contexts, as information is often distributed through media channels. However, the media can never depict the complete reality and is limited to painting a partial picture. In addition, the portrayed reality is prone to various types of distortions, the so-called media bias (Entman 2007).[1] Consequently, decisions by individuals based on information provided by the media might deviate from decisions based on less biased and more comprehensive information. For instance, Dewenter et al. (2016) find evidence that the number of car sales depends, to some extent, on media coverage of the automotive industry, Eisensee and Strömberg (2007) analyse the effects of media coverage of natural disasters on US disaster relief decisions, and Beckmann et al. (2017) find that media coverage of terror attacks causes further terroristic activities in terms of the number of incidents as well as the severity of terror acts.

In the economic context, for Nadeau et al. (2000), Soroka (2006), and van Raaij (1989) the assessment of the state of the economy and economic expectations depend, at least in parts, on media reports. Alsem et al. (2008), Goidel and Langley (1995), as well as Doms and Morin (2004) show the impact of media reporting on consumer climate. Garz (2013) analyses the impact of distorted media coverage on unemployment on job insecurity

[1] Of the various types of media bias, the most prominent are: advertising bias, when media change their news coverage in tone or volume in favour of their advertising clients (see Dewenter & Heimeshoff, 2014, 2015; Gambaro & Puglisi 2015 or Reuter & Zitzewitz 2006); newsworthiness bias, when news on certain issues crowd out coverage on other issues because they are seen as more newsworthy (see Durante & Zhuravskaya, 2015 or Eisensee & Strömberg, 2007); the negativity bias, when media focus more on catastrophes, crime, and threatening political and economic developments in comparison to more positive news (see Friebel and Heinz, 2014; Garz, 2013, 2014; Heinz and Swinnen, 2015; or Soroka, 2006); and political bias, when media coverage favours one or another side of the political spectrum (see Anderson & McLaren, 2010; Besley & Prat, 2006; Gentzkow and Shapiro (2010), Groseclose and Milyo, 2005; Prat, 2014). In addition, there is a broad literature on the existence of media biases and their foundations in communication and media science. Examples include Ball-Rokeach (1985) as well as Ball-Rokeach and DeFleur (1976) on the dependencies of the media-system, and Dunham (2013) on the measurement of media biases.

perceptions and Lamla and Maag (2012) investigate the role of media reporting for inflation forecasts of households and professional forecasters. In the political context, Bernhardt et al (2008), D'Alessio and Allen (2000), Druckman and Parkin (2005), Entman (2007), Gentzkow et al (2011), as well as Morris, (2007) analyse the impact of media coverage on political attitudes and voter decisions. Gentzkow et al (2015) estimate the effect of party control of state governments on the entry, exit, circulation, prices, number of pages, and content of daily newspapers.

A closer look at the impact of media coverage in the political context is provided by Snyder and Strömberg (2010). In their comprehensive analysis, the authors find that voters living in regions with insufficient political media coverage are less able to recall or evaluate their representatives. This also affects the work of the politicians: Less covered congressmen are less willing to serve as witness at congressional hearings or serve on committees. Finally, regions with less press coverage of representatives receive less federal spending.

The impact of media coverage on electoral outcomes is the focus of Enikolopov et al. (2011). The authors analyse electoral outcomes of the 1999 parliamentary elections in Russian regions with differing access to an independent national TV channel. The authors find that access to independent TV led to a decreased vote for the governing party by 8.9 percentage points and to an increased vote for major opposition parties by 6.3 percentage points. The results are comparable to those of DellaVinga and Kaplan (2007), which looks at the rolling out of the conservative Fox News Channel across US states. The authors find that Republicans gained 0.4 to 0.7 percentage points in presidential elections between 1996 and 2000 in the cities that had access to Fox News.

Our contribution is connected to DellaVinga and Kaplan (2007), Enikolopov et al. (2011) as well as to Snyder and Strömberg (2010). However, instead of looking at voting behaviour, we aim to provide a concise analysis of how media reporting affects short- and long-term political preferences, operationalised as *voting intentions* and *party affiliation*, respectively.

3 The Data

3.1 Data on Media Coverage

The media data used in our study are based on media content analysis carried out by Media Tenor International. The data are derived from text analyses of leading media

outlets, conducted by human analysts. It contains information on the media type (e.g. daily newspapers, magazines, television news), the topic (e.g. foreign affairs, unemployment, sports), participating persons and institutions (such as politicians and political parties), region of reference (e.g. Germany, EU, USA), time reference (e.g. past, present, future), and the source of information (journalist, expert etc.). In addition, the analysts evaluate the reports with respect to the sentiment toward persons or institutions. In contrast to human coding utilized in the current study, which achieves an accuracy of 0.85 at the minimum, computer linguistic approaches achieve accuracy no more than 0.60-0.70, especially when it comes to topical context as well as tonality (Grimmer and Steward, 2013). Consequently, the authors conclude that, for political text analysis, there is (at least so far) no adequate substitute for human coding.[2]

In our empirical analysis, we use the tonality of media coverage on political parties as our explanatory variable. As each report is coded as positive, negative, or neutral, an overall consideration of a media product's tonality toward a specific party can simply be created by adding up the single evaluations of the reports. The tonality *s* of outlet *i* on a certain political party *x* can then be defined as:

$$s_{i,t} = \frac{x_{i,t}^{+} - x_{i,t}^{-}}{X_{i,t}},$$

where $x_{i,t}^{+}$ is the number of positive news in medium *i* in time *t*, $x_{i,t}^{-}$ is the number of negative news, and $X_{i,t}$ is the total number of positive, negative, and neutral news on a political party *x* in medium *i* in time *t.* The tonality $s_{i,t} \in$ (-1,0,1) ranges from -1 (all news about *x* are negative) to +1 (all news about x are positive). For the empirical analysis in section 4, the reports from different mediums *i* are aggregated for each political party, resulting in an overall tonality of media for each party (S_t).

Our media set consists of 35 different media outlets from Germany (3 private TV news shows, 4 public service TV news shows, 11 public service TV political magazines, 7 daily newspapers, 10 magazines). Each report was analysed news item by news item; that is, that each time that a new person, institution, topic, or source etc. appears, a further news item is coded. News items were analysed over the February 1998 to December 2012 period. Overall, 10,105,239 news items on political issues and/or protagonists are

[2] The reliability of the coding is checked by Media Tenor on an ongoing monthly basis with both quarterly standard tests and random spot checks. Media Tenor guarantees a minimum accuracy of 0.85.

included in the analysis. Although the reports are available as daily observations, we calculate the tonality of reports on a monthly basis, as the data on political preferences are only available on a monthly basis.

In the analysis we focus on the centre-right Christian Democratic Union/Christian Social Union (CDU/CSU), the centre-left Social Democratic Party (SPD), the liberal Free Democratic Party (FDP), as well as on the Greens (Gruene). Dropping all items that do not focus on these parties and their representatives results in a total of 9,451,032 news items on CDU/CSU, SPD, FDP and Gruene.[3]

3.2 Data on Political Preferences

The data on political preferences and sentiments are taken from the *Politbarometer* surveys. Since 1977, *Politbarometer* surveys are performed at about monthly intervals by *Forschungsgruppe Wahlen* (Institute for Election Research). The aim of the *Politbarometer* is to poll the opinions and attitudes of eligible Germans regarding not just current events and issues but also political parties and politicians. A multi-stage random sample of the German residential population eligible to vote is selected. The data are collected by telephone interview (CATI) with standardized questionnaires. About 1,700 interviews are conducted each month. For the present analysis, two different questions from the survey are used to capture political preferences: *party affiliation* and *voting intention*.

For the indicator *party affiliation,* the survey asks participants whether they have a general tendency for a specific political party. This variable reflects political long-term preferences *Voting intention* is the indicator for short-term preferences. A general preference for one party does not mean that this person will also vote for this party. External factors, like media reporting or the performance of the government, are assumed to impact voting intention and behaviour. The current empirical analysis investigates whether the tonality of media coverage about political parties impacts long-term political preferences (*party affiliation*) and short-term political preferences (*voting intention*).

To control for socio-demographic characteristics that are expected to impact voter preferences, several variables from the *Politbarometer* survey are used: The *age* of respondents is divided into 10 categories (from 17 to 70 or older), *education* is scaled

[3] See Table A1 in the Appendix. Note that the numbers of observations used in our estimations are considerably smaller because of aggregation.

from 1 to 7 (no education to university degree), *political interest* is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest), *economic situation* and *own economic situation* are scaled from 1 to 5 (very good to very bad) and reflect the assessment of the economic situation in Germany, in general, and of the respondent, in particular. *Confession, married, female, unemployed* and *labour union* are all dummy variables that equal one if the person is catholic, married, female, unemployed or member in a labour union, and zero otherwise.

Forschungsgruppe Wahlen randomly chooses participants for each survey. Therefore, the monthly *Politbarometer* survey is a repeated cross-section because each month a new random sample is taken from the population.

The combined data set is a repeated cross-section, which encompasses media coverage on political parties, the individual characteristics of the respondents, the macroeconomic variables, and the two variables of interest, *party affiliation* and *voting intention,* on a monthly basis from February 1998 through December 2012. Accordingly, our data comprise a large set of individual voter characteristics as well as their party preferences and voting intention for a forthcoming election.

4 Empirical Strategy and Results

4.1 Identification Strategy

To identify the effects of media coverage on long-term political preferences (*party affiliation*) and short-term political sentiment (*voting intention*), we first use simple probit regressions. Probit regressions are preferable as the linear probability model may lead to biased and inconsistent estimates (Horrace & Oaxaca, 2006). However, as our explanatory variables may suffer from endogeneity, we also provide results from a linear probability model (see Appendix tables A2 and A3).[4]

As discussed above, media coverage and political preferences may be co-determined, which can lead to either an omitted variable or reverse causality. On the one hand, as media coverage might impact political preferences, consumers' political preferences

[4] The F-statistic testing the joint significance of the model is clearly larger than the critical value and leads to a rejection of the null hypothesis (p-value equals 0.000), so the model provides a better fit than the constant-only model. However, the rather small R-squared reveals that the model can explain only some of the variation in the response variable. Some omitted variables may be the reason for this low R-squared, thus further supporting the use of an instrumental variable approach.

might also impact a media outlet's coverage. This would hold if media outlets react to the moods of their consumers. In this case, the estimate would be biased due to reverse causality. On the other hand, the results could also suffer from endogeneity in terms of an omitted variable bias. This would be the case, for example, if the media generally reacts to the political mood of the electorate. If political media coverage changes, either because of changing political moods or for other reasons, such as a political crisis, and this change in media reporting is not covered by the variables used, an omitted variables bias occurs.

At least for the problem of reverse causality, the sign of the bias could be determined. As we expect both effects to be positive, the probit estimates might overestimate the positive impact of media coverage on the political preferences. For instance, a more pronounced intention for the SPD and better poll results, can lead to more positive media coverage of this party. The effect of media coverage on voting intentions is also expected to be positive (more positive media coverage enhances voting intention for this party). In case that the regressions also suffer from omitted variables, the sign of the bias would depend on the impact of the omitted variable. Therefore, the overall direction and size of the bias is unclear.

In order to address endogeneity, an instrumental variable approach is applied. Therefore, the media coverage of political parties is instrumented using the dummy variables described below. We also use macroeconomic variables as instruments for media coverage: unemployment rate, CPI, and the ifo business climate index. However, if these macroeconomic variables have a direct effect on political preferences or the voting intentions of individuals (or through other channels except media reports), they might be correlated with the error term. In this case, the macroeconomic variables would not be good instruments.

Instead, we use monthly dummies to instrument media coverage, which is intended to represent seasonal fluctuations in the reports. Moreover, dummies for the pre-election year are used (the dummies equal one for the period of one year prior to elections in 2002, 2005, and 2009, respectively) as media reports about political parties might be especially extensive during these periods. Thus, we follow the approach of Angrist and Krueger (1991) who instrument years of schooling with the quarter of birth to estimate the effect of years of schooling on earnings. They exploit an institutional constraint that the birthday cut-off determines the age when children enter school (children who are born in the first quarter are old for their grade, while those born in the last quarter are very young). Our

time dummies are supposed to capture the variance in media coverage over the year, which is affected by seasonal fluctuations. The pre-election dummies cover the increased (and potentially more critical) media coverage of political parties before an election.

To be able to implement the instrumental variable approach in section 4.3, two main requirements must be fulfilled by the instruments. The instrument must be strongly correlated with the endogenous explanatory variables conditional on the other covariates (instruments are relevant) and the instrument is not correlated with the error term in the explanatory equation conditional on the other covariates (exclusion restriction). While the former can be verified by several statistical tests, which are presented in section 4.3, the latter cannot be tested. However, seasons (monthly dummy variables) as well as pre-election periods are neither affected by political mood nor are they influenced by media coverage or political preferences. Therefore, we believe that both sets of dummy variables are adequate and exogenous instruments for media coverage. The instrumental variable estimation is further described in section 4.3.

4.2 Probit Estimation

Both variables of interest, *party affiliation* and *voting intention,* are binary variables that equal 1 when a person prefers a specific party or when the individual intends to vote for a party (for example, if they want to vote for the SPD party, the indicator voting intention for SPD equals one, while it equals zero for all other parties). Therefore, a probit model is estimated in order to analyse the effect of media coverage on political preferences. As shown above, the tonality of media coverage with respect to the various parties is scaled from -1 to +1. A negative tone toward the CDU/CSU party, for example, is reflected by a negative score for S_{CDU}.

The models estimated in tables 1 and 2 (i.e. for short- and long-term preferences) can be described with the following set of j equations:

$$\Pr(Y_{nt}^{j}=1)=\Phi\left(\beta_0+\beta^{j}S_{t-1}^{j}+\beta^{d}x_{nt}^{d}+\beta^{k}x_{t}^{k}\right),$$

where Y_{nt}^{j} is either a persons' party affiliation (table 1) or voting intention (table 2) for party *j*, with *j=CDU, SPD, FDP, or Gruene* at time *t* (with *n* = 1, …, *N,* where *N* is a randomly drawn sample of respondents in every period). S_{t-1}^{j} is the respective lagged aggregated tonality of media reports on party *j*. For example, if voting intention for SPD is considered,

only reports on the SPD are included while all other reports are dropped. x_{nt}^{d} comprises the d=10 explanatory variables that control for sociodemographic characteristics that vary with the respondents. x_{t}^{k} covers the k=*3* macroeconomic variables described above. β*'s* are respective coefficients vectors and Φ is the cumulative normal distribution.

The lagged value of the tonality of media reports ($S_{CDU,t-1}$, $S_{SPD,t-1}$, $S_{FDP,t-1}$,$S_{GRUENE,t-1}$) is implemented in the probit model, as we expect media coverage to have a delayed effect on individual preferences. In general, one can assume that it takes some time until news on political parties or persons are spread. Moreover, reports do not have a direct effect on the preferences of voters, but it is more like a gradual process of forming an opinion about the news presented.

Table 1: Probit Estimation – Media Coverage and Party Affiliation

PARTY AFFILIATION/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.316***			
	(0.0730)			
SPD		0.137**		
		(0.0684)		
FDP			1.145***	
			(0.0823)	
GRUENE				0.243***
				(0.0902)
Individual variables				
Age	0.0516***	0.0183***	-0.000418	-0.0340***
	(0.00153)	(0.00152)	(0.00283)	(0.00194)
Education	-0.0102**	-0.0974***	0.134***	0.384***
	(0.00431)	(0.00443)	(0.00792)	(0.00676)
Confession	0.438***	-0.316***	-0.0901***	-0.171***
	(0.00671)	(0.00714)	(0.0130)	(0.0100)
Married	0.0785***	0.00729	-0.0121	-0.0509***
	(0.00691)	(0.00687)	(0.0129)	(0.00992)
Female	-0.0546***	0.0849***	-0.142***	0.273***
	(0.00690)	(0.00699)	(0.0126)	(0.0101)
Unemployed	-0.172***	0.0430	-0.0887	-0.0344
	(0.0551)	(0.0498)	(0.103)	(0.0747)
Labour union	-0.360***	0.378***	-0.300***	0.0990***
	(0.0109)	(0.00967)	(0.0227)	(0.0143)
Assessment of economic situation	-0.0528***	-0.0633***	0.0205**	-0.0757***
	(0.00564)	(0.00552)	(0.0100)	(0.00774)
Own economic situation	-0.152***	-0.0154***	-0.0530***	0.00889
	(0.00546)	(0.00546)	(0.0103)	(0.00776)
Political interest	-0.0816***	-0.116***	-0.116***	-0.113***
	(0.00377)	(0.00386)	(0.00731)	(0.00550)
Macroeconomic variables				
Unemployment rate	0.0256***	0.0106**	0.0657***	0.0295***
	(0.00410)	(0.00420)	(0.00735)	(0.00609)
CPI	-7.26e-05	-0.0127***	0.0233***	0.0186***
	(0.000884)	(0.000865)	(0.00173)	(0.00128)
ifo	-0.00258***	-0.000219	-0.00710***	0.00132**
	(0.000439)	(0.000485)	(0.000796)	(0.000628)
Constant	-0.234**	1.153***	-3.728***	-4.210***
	(0.104)	(0.104)	(0.210)	(0.164)
Observations	175,617	175,617	175,617	175,617
Wald-chi	8992.56	5850.31	1606.39	7164.41
(Prob-chi)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Pseudo R-squared	0.0487	0.0320	0.0377	0.0859

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

Additionally, the frequency of the data supports the use of lagged values for media coverage. The *Politbarometer* is a monthly survey while media reports are collected by

their date of publication. In the combined data set that is used for the analysis, reports published at the beginning and at the end of a month are represented by the same time stamp. However, the latter can hardly affect the intentions of voters. Therefore, it is reasonable to lag media coverage by one month. To check the assumption of a lagged effect, we also estimate a model including contemporary media coverage, which is indeed statistically insignificant. We also consider a temporal effect over several periods; however, regressions with higher order lags do not lead to significant results.

Table 1 shows the results for the effect of media coverage on long-term party affiliation. The exogenous variables *age, education, confession, married, female, unemployed, labour union, political interest,* and *own economic situation* control for socio-demographic characteristics. The interpretation of these factors is left to section 4.4, where we take a closer look at the impact of individual characteristics and macroeconomic factors (in particular with regard to voting intentions). Macroeconomic effects are captured by the *ifo business climate index, the unemployment rate,* and *the consumer price index,* for which only contemporary effects are considered. Including additional lags of the *ifo business climate index, the unemployment rate,* and *the consumer price index* leads to multicollinearity issues. However, as one might expect that macroeconomic factors could also have a delayed effect, we estimate models with different lags and excluding contemporary effects. Although the coefficients of the other variables do not change significantly when lagged values are used, only the first lag seems to be significant. Therefore, results are shown with the contemporary effects of the macroeconomic factors.[5] The overall significance of the model is tested with a Wald Chi-Square statistic. The small p-value (equals 0.000 for all probit models in tables 1 and 2) leads to a rejection of the null hypothesis that all regression coefficients are simultaneously equal to zero.[6] Standard errors are clustered to account for the macroeconomic variables that are constant for individuals and that only vary over time.

[5] We estimated models excluding the macroeconomic variables as well. All coefficients for media coverage are still positive and statistically significant. However, the macroeconomic factors might be able to explain some additional variation in the dependent variables.

[6] For the probit estimation, a pseudo R-squared is calculated. These values are similar to the R-squared in the linear probability models in Appendix tables A2 and A3. The small values give rise to an omitted variable problem in the probit model, thus supporting the use of an instrumental variable approach.

Turning to the variables of main interest, the coefficients of $s_{j,t-1}$ are found to be positive and statistically significant for all parties. A positive report on the party Gruene, for example, has a positive effect on the preferences toward this party.

Party affiliation reflects the long-term preferences of voters as there are individuals who tend to support a specific party due to a general consensus with the party program and other factors, like family tradition. Nevertheless, the results in table 1 show that media coverage might impact long-term party preferences, as positive reporting on a party has an increasing effect on the preferences for the respective party.

To consider whether the effect is different for short-term preferences, table 2 presents results for voting intentions.

Controls are the same as in table 1 and S_{t-1}^{j} are again our focal variables. As people are asked for which party they would vote if elections were lying ahead, voting intention is an adequate indicator for short-term preferences. These short-term preferences can deviate from the general party affiliation and are expected to be influenced more strongly by external factors, like media coverage.

Hence, it is hardly surprising that the coefficients for our focal variables are indeed positive, statistically significant, and also larger than in table 1. A positive report on the SPD party, for example, has an enhancing effect on voter intentions. This is true for all parties. If media outlets report more positively about the respective party, voting intention for this party increases significantly. Reporting about a party has a strong effect on the voting intention and seems to have an influence on the voting decision of the electorate. In this case, it is also obvious that further lags for media coverage, which are statistically insignificant, are not necessary as voting intention captures short-term preferences. Voters are especially sensitive toward media reports as they are more attentive during election periods and, therefore, can be influenced more strongly by current media reports during this period.

Table 2: Probit Estimation – Media Coverage and Voting Intention

VOTING/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.866***			
	(0.0707)			
SPD		0.854***		
		(0.0678)		
FDP			1.892***	
			(0.0688)	
GRUENE				0.641***
				(0.0807)
Individual Variables				
Age	0.0335***	-0.00546***	-0.00506**	-0.0333***
	(0.00149)	(0.00147)	(0.00221)	(0.00177)
Education	-0.00326	-0.0774***	0.111***	0.339***
	(0.00425)	(0.00437)	(0.00636)	(0.00588)
Confession	0.381***	-0.236***	-0.0224**	-0.145***
	(0.00648)	(0.00709)	(0.0102)	(0.00880)
Married	0.0745***	0.00975	0.00906	-0.0167*
	(0.00682)	(0.00693)	(0.0106)	(0.00884)
Female	-0.0357***	0.0632***	-0.183***	0.231***
	(0.00688)	(0.00698)	(0.0103)	(0.00893)
Unemployed	-0.138***	0.0295	-0.210**	-0.0288
	(0.0507)	(0.0495)	(0.0890)	(0.0660)
Labour union	-0.340***	0.332***	-0.278***	0.0921***
	(0.0106)	(0.00980)	(0.0174)	(0.0128)
Assessment of economic situation	-0.0791***	-0.104***	0.0312***	-0.0791***
	(0.00554)	(0.00544)	(0.00808)	(0.00685)
Own economic situation	-0.165***	-0.0385***	-0.0628***	-0.0111
	(0.00527)	(0.00541)	(0.00827)	(0.00686)
Political interest	-0.0578***	-0.0794***	-0.115***	-0.122***
	(0.00361)	(0.00376)	(0.00578)	(0.00487)
Macroeconomic variables				
Unemployment rate	0.0442***	-0.0347***	0.0755***	-0.0110**
	(0.00397)	(0.00412)	(0.00578)	(0.00553)
CPI	0.000448	-0.0245***	0.0213***	0.0206***
	(0.000847)	(0.000861)	(0.00134)	(0.00115)
ifo	-0.00628***	0.000506	-0.0147***	0.00546***
	(0.000425)	(0.000490)	(0.000639)	(0.000580)
Constant	0.285***	2.790***	-2.409***	-4.064***
	(0.0988)	(0.103)	(0.163)	(0.145)
Observations	175,617	175,617	175,617	175,617
Wald-chi	7962.57	4889.81	3495.46	8668.98
(Prob-chi)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Pseudo R-squared	0.0400	0.0266	0.0477	0.0808

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1 According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

4.3 Instrumental Variable Estimations

Endogeneity issues mean that the estimates presented above are likely to be both biased and inconsistent. We address this by using different instrumental variables, such as seasonal dummies as well as pre-election dummies, for media coverage; as discussed above.

To account for the binary dependent variables, *party affiliation* and *voting intention,* an instrumented probit model is estimated. However, Appendix tables A4 and A5 show that the results of linear instrumental variable regression are in line with the probit models and can directly be interpreted as marginal effects.

Formally, the model estimated in tables 3 and 4 is described by the two-step approach below:

$$Y_{nt}^{j} = \beta^{j} S_{t-1}^{j} + \beta^{d} x_{nt}^{d} + \beta^{k} x_{t}^{k} + u_{nt}$$
$$S_{t-1}^{j} = \alpha_0 + \alpha^{d} x_{nt}^{d} + \alpha^{k} x_{t}^{k} + \alpha^{m} z_{t}^{m} + \upsilon_{nt},$$

where Y_{nt}^{j} can again be either *party affiliation* or *voting intention* with *j=CDU, SPD, FDP, or Gruene*.[7] The vectors x_t^k and x_{nt}^d cover the identical explanatory variables as in the probit model in section 4.2 and comprises individual characteristics and macroeconomic variables. Media coverage S_{t-1}^{j} is the endogenous regressor that is expected to be correlated with the error term due to either omitted variable bias or reverse causality. z_t^m is a vector of *m* excluded instruments used to instrument media coverage. β's and α's are coefficient vectors and $(u_{nt}, \upsilon_{nt}) \sim N(0, \Sigma)$ are error terms. The exogenous variables, as well as the excluded instruments z_m, are implemented in the reduced form equation S_{t-1}.

In order to address the endogeneity, media coverage on political parties is instrumented by several dummy variables, as mentioned in section 4.1. In particular, monthly dummies are used to capture the variance in media coverage over the year, which is supposed to be affected by seasonal fluctuations and recurring events. Further instruments are dummy variables for the pre-election years. These dummies equal one for the period of one year prior to the elections in 2002, 2005, and 2009, respectively. Before an election, media

[7] Y_j cannot be observed; instead, we observe: $Y_j = \begin{cases} 0 & Y_j < 0 \\ 1 & Y_j \geq 0 \end{cases}$

reports are particularly extensive and possibly more critical about politicians and political parties. The pre-election dummy variables capture this increased reporting.[8]

Results for the instrumented probit estimation for the long-term indicator *party affiliation* are presented in table 3. Controls are the same as in the probit estimation in table 1, including both individual characteristics and macroeconomic factors. For a closer look at the impact of the individual characteristics and the macroeconomic variables, please see section 4.4, where these factors are summarized.

Most interestingly, the effect of media coverage on long-term preferences vanishes when using an instrumental variable approach. The coefficients for media coverage are only significant for FDP voters. With respect to other parties, reports do not have a significant effect on the party affiliation of individuals. Hence, we cannot conclude that media coverage impacts long-term political preferences. This is hardly surprising and in line with economic theory according to which long-term preferences are stable.

For the question of *party affiliation,* the *Politbarometer* survey asks the individuals whether they have a general preference for one political party. Therefore, *party affiliation* can be interpreted as a measure of long-term preference. This preference is determined by a general agreement with the party program or family tradition and the like. Funk and Sears (1999) show evidence for the long-term persistence of political preferences by examining a longitudinal study of 37 years. Our results confirm that long-term preferences are stable and contemporary events seem to have no effect on these preferences.

[8] We also consider smaller time windows for the pre-election period. However, results do not change for a timeframe of half a year prior to the election. Shorter windows are not useful due to multicollinearity with the other time dummies.

Table 3: Instrumental Variable Estimation – Media Coverage and Party Affiliation

PARTY AFFILIATION/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.172			
	(0.207)			
SPD		0.0462		
		(0.226)		
FDP			1.635***	
			(0.153)	
Gruene				-0.402
				(0.291)
Individual Variables				
Age	0.0516***	0.0183***	-0.000356	-0.0342***
	(0.00150)	(0.00153)	(0.00275)	(0.00212)
Education	-0.0102**	-0.0974***	0.134***	0.384***
	(0.00434)	(0.00440)	(0.00816)	(0.00660)
Confession	0.438***	-0.316***	-0.0911***	-0.171***
	(0.00670)	(0.00712)	(0.0130)	(0.0101)
Married	0.0784***	0.00729	-0.0121	-0.0508***
	(0.00691)	(0.00700)	(0.0130)	(0.00987)
Female	-0.0547***	0.0849***	-0.141***	0.273***
	(0.00690)	(0.00703)	(0.0129)	(0.00980)
Unemployed	-0.173***	0.0428	-0.0864	-0.0342
	(0.0548)	(0.0484)	(0.102)	(0.0730)
Labour union	-0.360***	0.378***	-0.299***	0.0985***
	(0.0108)	(0.00963)	(0.0224)	(0.0143)
Assessment of economic situation	-0.0521***	-0.0634***	0.0213**	-0.0729***
	(0.00550)	(0.00550)	(0.01000)	(0.00782)
Own economic situation	-0.152***	-0.0154***	-0.0549***	0.00893
	(0.00542)	(0.00541)	(0.0101)	(0.00765)
Political interest	-0.0817***	-0.116***	-0.117***	-0.114***
	(0.00388)	(0.00395)	(0.00746)	(0.00572)
Macroeconomic variables				
Unemployment rate	0.0269***	0.00996**	0.0662***	0.0213***
	(0.00455)	(0.00441)	(0.00769)	(0.00710)
CPI	-0.000673	-0.0130***	0.0268***	0.0193***
	(0.00121)	(0.00112)	(0.00195)	(0.00135)
ifo	-0.00252***	7.02e-06	-0.00657***	0.00144**
	(0.000454)	(0.000738)	(0.000794)	(0.000635)
Constant	-0.209*	1.157***	-4.077***	-4.275***
	(0.112)	(0.106)	(0.232)	(0.167)
Observations	175,617	175,617	175,617	175,617
Wald-chi	9385.91	5936.39	1611.66	6914.29
(Prob-chi)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Wald test of exogeneity	0.56	0.19	14.51	5.40
(Prob-chi)	(0.4537)	(0.6653)	(0.0001)	(0.0201)

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

The results change significantly when it comes to voting intentions, which reflect the short-term preferences of voters. Table 4 shows the results.

Table 4: Instrumental Variable Estimation – Media Coverage and Voting Intention

VOTING/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.562***			
	(0.201)			
SPD		1.196***		
		(0.225)		
FDP			2.755***	
			(0.125)	
Gruene				-0.534**
				(0.260)
Individual Variables				
Age	0.0335***	-0.00551***	-0.00505**	-0.0336***
	(0.00145)	(0.00151)	(0.00225)	(0.00190)
Education	-0.00313	-0.0774***	0.111***	0.339***
	(0.00422)	(0.00436)	(0.00658)	(0.00574)
Confession	0.381***	-0.235***	-0.0243**	-0.145***
	(0.00656)	(0.00702)	(0.0104)	(0.00887)
Married	0.0744***	0.00971	0.00898	-0.0166*
	(0.00674)	(0.00698)	(0.0106)	(0.00882)
Female	-0.0359***	0.0630***	-0.183***	0.230***
	(0.00672)	(0.00699)	(0.0105)	(0.00874)
Unemployed	-0.139***	0.0302	-0.204**	-0.0282
	(0.0519)	(0.0485)	(0.0886)	(0.0651)
Labour union	-0.340***	0.332***	-0.277***	0.0913***
	(0.0104)	(0.00965)	(0.0173)	(0.0127)
Assessment of economic situation	-0.0775***	-0.103***	0.0331***	-0.0742***
	(0.00537)	(0.00548)	(0.00813)	(0.00698)
Own economic situation	-0.164***	-0.0382***	-0.0662***	-0.0110
	(0.00528)	(0.00541)	(0.00820)	(0.00686)
Political interest	-0.0579***	-0.0793***	-0.116***	-0.123***
	(0.00378)	(0.00392)	(0.00603)	(0.00509)
Macroeconomic variables				
Unemployment rate	0.0470***	-0.0324***	0.0749***	-0.0259***
	(0.00441)	(0.00439)	(0.00614)	(0.00646)
CPI	-0.000799	-0.0234***	0.0271***	0.0219***
	(0.00118)	(0.00111)	(0.00152)	(0.00122)
ifo	-0.00617***	-0.000403	-0.0136***	0.00567***
	(0.000444)	(0.000737)	(0.000647)	(0.000567)
Constant	0.337***	2.791***	-2.992***	-4.186***
	(0.109)	(0.105)	(0.180)	(0.151)
Observations	175,617	175,617	175,617	175,617
Wald-chi	8084.69	4882.34	3197.43	8568.86
(Prob-chi)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Wald test of exogeneity	2.63	2.56	68.14	22.65
(Prob-chi)	(0.1050)	(0.1094)	(0.0000)	(0.0000)

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

First, media coverage still has a positive and significant effect on *voting intentions*. It is only for the Gruene party that the effect becomes negative, which is rather surprising, as positive reports about party typically enhances voting intentions.

A possible reason could be that the variation for this smaller party in our sample is too low. There is be only a smaller number of reports about the *Gruene* party and, moreover, as it is a smaller party, reports attributed to the party *Gruene* might not solely deal with it, which could lead to bias in this estimate. However, results for the larger parties (especially for the two big parties in Germany, *CDU/CSU* and *SPD*) are consistent, with all positive and statistically significant coefficients, thus verifying the impact of media reports on the short-term preferences of voters.

Positive media reports about the CDU/CSU, for example, have an increasing effect on the voting intention for it. Moreover, the coefficient for $s_{CDU,t-1}$ is smaller than in the probit estimation in table 1. This is as expected, as probit estimations tend to overestimate the effect due to the simultaneity bias. However, the coefficients for $s_{SPD,t-1}$ and $s_{FDP,t-1}$are larger than those in the probit estimation, but still positive and statistically significant. Therefore, there seems to be an omitted variable bias as well; however, the exact direction of the bias is unclear. Nevertheless, the results confirm the expectations that media reports have a strong impact on voting intensions, thus affirming the important role of the media. Media coverage has a strong impact on the opinion formation of voters, especially during electoral periods, while long-term preferences are rather stable (comparing results in table 3).

To demonstrate the validity of the results of the instrumental variable estimation presented above, we carry out several tests to confirm that the time dummy variables and the pre-election dummies are adequate instruments for the media coverage of political parties.[9]

We first check if the results suffer from underidentification. This is the case when the instruments are not correlated with the endogenous regressor. High values for the Kleibergen-Paap rk LM statistic, as well as for the Kleibergen-Paap rk Wald statistic (with p-values equal to 0.000), result in the strong rejection of the null hypothesis of no

[9] In the instrumented probit estimation (presented in tables 3 and 4), the reduced form for the endogenous explanatory variable is linear, so we can use the same diagnostics as in the linear case to evaluate the strength of our instruments. Results of the tests equally apply to the linear instrumental variable estimation presented in Appendix tables A4 and A5.

correlation, thus confirming the relevance of the instruments ($\Pi_m \neq 0$). However, if underidentification is rejected, it could still be the case that the model is only weakly identified. To test for weak correlation of the instruments with the regressor, a weak identification test (using Kleibergen-Paap rk Wald F test) is considered. The statistic is clearly larger than the critical values based on Stock-Yogo and we reject the null hypothesis of weak correlation. Thus, the above model does not suffer from weak instruments and the instruments are strongly correlated with the regressor. Moreover, the Wald-test of overall significance is larger than the critical value resulting in a clear rejection of the null hypothesis, thus confirming that the model fits the data well.

4.4 What drives the Electorate? A Closer Look

As voting intentions are of special interest for the outcomes of elections, we take a closer look at the results provided in table 4. As mentioned, by applying instrumental variable estimation, we can identify a **positive impact of media coverage** on short-term voting intentions, at least in the case of CDU/CSU, SPD, and FDP. The more positive the media coverage of CDU/CSU, SPD, and FDP, the greater the tendency to vote for it. However, the impact vanishes when it comes to long-term political preferences (party affiliation). These results are in line with economic theory. Long-term preferences are stable and contemporary events, such as media reports, seem to have no effect on these preferences.

A closer look on the impact of individual characteristics broadly confirms findings of public opinion research in Germany: **Females** have a higher tendency to vote for the more leftish SPD and Gruene, but a lower tendency to vote for the Christian conservative CDU/CSU and liberal-conservative FDP. The **elderly** have a higher tendency to vote for the Christian conservative CDU/CSU and not the SPD, FDP, and Gruene. **Catholic** voters have, not surprisingly, a higher tendency to vote for Christian conservative CDU/CSU and a lower tendency to vote for SPD, FDP, and Gruene. **Married** voters have a higher tendency to vote Christian conservative CDU/CSU and a lower tendency to vote for left-liberal Gruene. The higher the **education** of the voter, the higher the tendency to vote for the smaller and more liberal FDP or Gruene, and a lower tendency to vote for the mid-right conservative CDU/CSU. If a voter is **unemployed**, the tendency to vote for CDU/CSU and FDP is lower. If he or she is member of a **labour union,** the tendency to vote for the more leftish SPD and Gruene is high, but the tendency to vote for the more rightist CDU/CSU and FDP is low. Voters with a positive assessment of the **general economic**

situation have a higher tendency to vote for CDU/CSU and SPD, the established parties. However, if the assessment of their **own economic situation** is rather negative, the tendency to vote for any of the concerned parties decreases. Finally, if the voter sees him- or herself as **politically interested,** they have a higher tendency to vote for all considered political parties CDU/CSU, SPD, FDP, and Gruene.[10]

A closer look at the macroeconomic control variables shows that the higher the **unemployment rate,** the higher the tendency to vote for CDU and FDP and the lower the tendency to vote for SPD and Gruene. In addition, the higher the **inflation rate,** the lower the tendency to vote for the more leftish SPD. Finally, the better the **business climate,** the lower the tendency to vote for CDU and FDP.

5 Conclusion

As the rise of populist and right-wing political movements is connected to extensive media coverage, the question arises whether media report more on political parties because of their success or if their success is caused by media reports. To tackle this question, we investigate how media coverage affects short- and long-term political preferences, namely *party affiliation* and *voting intention.*

For our empirical analysis, we merge 14 years of human coded data derived from leading media in Germany with the results of the comprehensive German *Politbarometer* survey from February 1998 through December 2012. As media coverage may not only affect voter political preferences but also the general political mood among the electorate, we assume that endogeneity and reverse causality are present. Hence, we employ probit estimations with time lag techniques as well as instrumental variable estimations to address these issues.

First, the results of the probit estimations indicate that media coverage impacts both long-term party affiliation and short-term voting intentions. However, these results could be caused by the simultaneity of the two variables of interest – media coverage and political preferences (both *party affiliation* and *voting intention*). Hence, the probit estimation

[10] For the interpretation of these coefficients, one should keep in mind the definition for the three variables *general economic situation, own economic situation,* and *political interest*. A low value for these variables corresponds to a positive assessment of the (own) economic situation and a high political interest, respectively. Whereas a high value reflects a negative assessment and no political interest. See section 3.2 for a more detailed variable description.

might lead to a biased estimate of media coverage on the political preferences variables. To correct for this bias, an instrumental variable (IV) approach is applied.

Results for the instrumental variable estimation of the long-term party affiliation reveal that the effect of media coverage on long-term preferences vanishes. Hence, we cannot conclude that media coverage impacts long-term political preferences. This is not surprising, as preferences are rather stable. The survey asks individuals whether they have a general preference for one political party. This preference is determined by a general agreement with the party program, family tradition, and the like. This result is consistent with the economic theory. Long-term preferences are stable, with contemporary events seeming to have no effect on these preferences.

However, the results clearly differ when it comes on voting intentions, which reflect the short-term preferences of voters. After instrumenting media coverage, it still has a positive and significant effect on voting intentions. The more positively a party is covered by the media, for instance in the context of improving poll results, the higher the tendency to vote for this specific party. This hints at the special responsibility of media in the political context.

Literature

Anderson S.P. and J. McLaren (2012), Media Mergers and Bias with Rational Consumers, Journal of the European Economic Association, 10, 831–859.

Angrist, J. D. and A. B. Krueger (1991), "Does Compulsory School Attendance Affect Schooling and Earnings?", Quarterly Journal of Economics, 106, 979-1014.

Alsem, K. J., Brakman, S., Hoogduin, L., & Kuper, G. (2008), The impact of newspapers on consumer confidence: does spin bias exist?, Applied Economics, 40, 531 - 539.

Ball-Rokeach, S. J. (1985), The origins of individual media-system dependency: a sociological framework", Communication Research, 12, 485-510.

Ball-Rokeach, S. J., & DeFleur, M. L. (1976), A dependency model of mass-media effects, Communication Research, 3, 3-21.

Beckmann, K., Dewenter, R. and Thomas, T. (2017), Can news draw blood? The impact of media coverage on the number and severity of terror attacks, Peace Economics, Peace Science and Public Policy, 23, 1-16.

Bernhardt, D., Krasa, S., & Polborn, M. (2008). Political polarization and the electoral effects of media bias. Journal of Public Economics, 92, 1092–1104.

Besley, T., & Prat, A. (2006). Handcuffs for the grabbing hand? Media capture and government accountability. American Economic Review, 96, 720–736.

D'Alessio, D. D.; Allen, M. (2000), Media bias in presidential elections: a meta-analysis, Journal of Communication, 50, 133–156.

DellaVigna, S. and E. Kaplan (2007), The Fox News Effekt: Media Bias and Voting, The Quarterly Journal of Economics, 122, 1187-1234.

Dewenter, R., & Heimeshoff, U. (2014). Media Bias and advertising: Evidence from a German car magazine. Review of Economics, 65, 77–94.

Dewenter, R., & Heimeshoff, U. (2015), More Ads, More Revs? A Note on Media Bias in Review Likelihood, Economic Modelling 44, 156-161.

Dewenter, R., U. Heimeshoff, and T. Thomas (2016), Media Coverage and Car Manufacturers' Sales, Economics Bulletin, 36, 976-982.

Doms, M. and N. Morin (2004), Consumer sentiment, the economy, and the news media. Finance and Economics Discussion Series 2004-51, Board of Governors of the Federal Reserve System.

Druckman J. N. and Parkin M. (2005), The Impact of Media Bias: How Editorial Slant Affects Voters, Journal of Politics, 67, 1030-1049.

Dunham, W.R. (2013), Framing the Right Suspects: Measuring Media Bias, Journal of Media Economics, 26, 122-147.

Durante, R., & Zhuravskaya, E. (2015). Attack when the world is not watching? International media and the Israeli-Palestinian conflict, CEPR Discussion Paper 10750. Forthcoming in: Journal of Political Economy.

Eisensee, T. and D. Strömberg (2007), News Droughts, News Floods, and U. S. Disaster Relief, The Quarterly Journal of Economics, 122, 693-728.

Enikolopov, R., Petrova, M. and Zhuravskaya, E. (2011) Media and Political Persuasion: Evidence from Russia, American Economic Review, 101, 3253–3285.

Entman R. M. (2007), Framing Bias: Media in the Distribution of Power. Journal of Communication, 57, 163-173.

Forschungsgruppe Wahlen, Mannheim (2017): Politbarometer 1977-2015 (Partielle Kumulation). GESIS Datenarchiv, Köln. ZA2391 Datenfile Version 7.0.0, doi:10.4232/1.12733.

Friebel, G., & Heinz, M. (2014). Media slant against foreign owners: Downsizing. Journal of Public Economics, 120, 97–106.

Funk, C. L., Sears, D.O. (1999), Evidence of the Long-Term Persistence of Adults' Political Predispositions, The Journal of Politics, 61, 1-28.

Gambaro, M., & Puglisi, R. (2015). What do ads buy? Daily coverage of listed companies on the Italian press. European Journal of Political Economy, 39, 41–57.

Garz, M. (2012), Job Insecurity Perceptions and Media Coverage of Labour Market Policy, Journal of Labour Research, 33, 528-544.

Garz, M. (2013), Unemployment Expectations, Excessive Pessimism, and News Coverage, Journal of Economic Psychology, 34, 156-168.

Garz, M. (2014), Good news and bad news: evidence of media bias in unemployment reports, Public Choice, 161, 499–515.

Gentzkow, M., & Shapiro, J. M. (2010). What drives media slant? Evidence from U.S. daily newspapers. Econometrica, 78, 35-71.

Gentzkow, M., A., Jesse M. Shapiro, Michael Sinkinson (2011), The Effect of Newspaper Entry and Exit on Electoral Politics, American Economic Review, Vol. 101, S. 2980-3018.

Gentzkow, M., N. Petek, J.M. Shapiro, M. Sinkinson (2015), Do Newspapers Serve the State? Incumbent Party Influence on the US Press, 1869-1928, Journal of the European Economic Association, 13, 29-61.

Goidel, R. K., & Langley, R. E. (1995), Media coverage of the economy and aggregate economic evaluations, Political Research Quarterly, 48(2), 313-328.

Grimmer, J. and B. M. Steward (2013) Text as Data: The Promise and Pitfalls of Automatic Content, Analysis Methods for Political Texts, Political Analysis, 21, 267-297.

Groseclose, T., & Milyo, J. (2005), A measure of media bias, Quarterly Journal of Economics, 120, 1191–1237.

Heinz, M., & Swinnen, J. (2015), Media slant in economic news: A factor 20, Economics Letters, 18–20.

Horrace, W. C. & R. L. Oaxaca, 2006. Results on the bias and inconsistency of ordinary least squares for the linear probability model. Economics Letters, 90, 321-327.

Kuhn, U. (2009), Stability and Change in Party Preferences, Swiss Political Science Review 15, 463–94.

Lamla, M. J. and T. Maag (2012), The Role of Media for Inflation Forecast Disagreement of Households and Professional Forecasters, Journal of Money, Credit and Banking, 7, 1325-1350.

Meier, S. and Sprenger, C. D. (2015), Temporal stability of time preferences. Review of Economics and Statistics, 97, 273–286.

Morris, J.S. (2007): Slanted Objectivity? Perceived Media Bias, Cable News Exposure, and Political Attitudes, Social Science Quarterly, Volume 88, S. 707–728.

Muller, L., Sefton, M., Steinberg, R., and Vesterlund, L. (2008). Strategic behavior and learning in repeated voluntary contribution experiments. Journal of Economic Behavior & Organization, 67, 782–793.

Nadeau, R., R. G. Niemi and T. Amato (2000), Elite economic forecasts, economic news, mass economic expectations, and voting intentions in Great Britain, European Journal of Political Research, 38, 135-170.

Prat, A. (2014), Media power, CEPR Discussion Paper No. 10094. Forthcoming in: Journal of Political Economy.

Reuter, J., & Zitzewitz, E. (2006), Do ads influence editors? Advertising and bias in the financial media, Quarterly Journal of Economics, 121, 197–227.

Snyder Jr., J.M. and D. Strömberg (2010), Press Coverage and Political Accountability, Journal of Political Economy, 118, 355-408.

Soroka, S. N. (2006), Good news and bad news: Asymmetric responses to economic information. The Journal of Politics, 68, 372-385.

van Raaij, W. F. (1989), Economic news, expectations and macro-economic behavior, Journal of Economic Psychology, 10(4), 473-493.

Appendix

Table A1: Analysed Media Set

Media	**Observations: News items on all political protagonists and topics**	**Observations: News items on CDU/CSU, SPD, FDP and Gruene only**
TV news shows (private)		
RTL aktuell	127,459	122,303
Sat.1 News	77,466	73,991
ProSieben News	43,272	41,697
TV news shows (public broadcasting service)		
Tagesthemen (ARD)	381,089	358,072
Tagesschau (ARD)	267,975	251,316
heute (ZDF)	247,482	231,649
heute journal (ZDF)	361,493	340,922
TV magazines (public broadcasting service)		
Fakt (MDR)	5,224	4,347
Frontal 21 (ZDF)	26,712	23,906
Kontraste (SFB)	6,333	5,176
Monitor (WDR)	6,490	6,101
Panorama (NDR)	10,085	8,779
Plusminus (ARD)	2,698	2,677
Report (BR)	8,875	7,968
Report (SWR)	8,698	7,348
WISO (ZDF)	5,029	4,675
Bericht aus Berlin (ARD)	77,432	68,989
Berlin direkt (ZDF)	102,667	94,117
Daily newspaper		
Bild	352,001	336,314
Berliner Zeitung	471,101	431,780
Die Welt	1,413,879	1,335,349
Die Tageszeitung (taz)	528,085	477,520
Frankfurter Allgemeine Zeitung (F.A.Z.)	1,379,282	1,288,424
Frankfurter Rundschau	970,249	898,476
Süddeutsche Zeitung (SZ)	1,210,440	1,132,985
Magazines and weeklies		
Bild am Sonntag (BamS)	140,659	136,157
Frankfurter Allgemeine Sonntagszeitung (FAS)	212,864	202,052
Focus	364,770	346,773
Spiegel	527,410	491,526
Welt am Sonntag (WamS)	180,217	172,823
Stern	113,860	108,010
Super Illu	38,124	29,515
Die Woche	76,885	70,809
Rheinischer Merkur	152,665	144,674
Die Zeit	206,269	193,812
Number of observations	10,105,239	9,451,032

Table A2: Linear Probability Model – Media Coverage and Party Affiliation

PARTY AFFILIATION VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.0955***			
	(0.0228)			
SPD		0.0410**		
		(0.0201)		
FDP			0.0771***	
			(0.00543)	
Gruene				0.0309**
				(0.0127)
Individual Variables				
Age	0.0161***	0.00532***	5.72e-05	-0.00426***
	(0.000462)	(0.000433)	(0.000190)	(0.000256)
Education	-0.00339**	-0.0297***	0.00892***	0.0469***
	(0.00133)	(0.00131)	(0.000517)	(0.000799)
Confession	0.142***	-0.0920***	-0.00580***	-0.0214***
	(0.00221)	(0.00200)	(0.000823)	(0.00122)
Married	0.0230***	0.00132	-0.00104	-0.00839***
	(0.00214)	(0.00205)	(0.000839)	(0.00130)
Female	-0.0173***	0.0252***	-0.0103***	0.0358***
	(0.00214)	(0.00206)	(0.000837)	(0.00135)
Unemployed	-0.0386***	0.0105	-0.00483	-0.00835
	(0.0123)	(0.0151)	(0.00495)	(0.00819)
Labour union	-0.105***	0.124***	-0.0174***	0.0146***
	(0.00284)	(0.00338)	(0.00100)	(0.00192)
Assessment of economic situation	-0.0164***	-0.0193***	0.00146**	-0.0105***
	(0.00175)	(0.00164)	(0.000671)	(0.000999)
Own economic situation	-0.0457***	-0.00505***	-0.00344***	0.00155
	(0.00160)	(0.00161)	(0.000646)	(0.000988)
Political interest	-0.0247***	-0.0339***	-0.00717***	-0.0129***
	(0.00113)	(0.00110)	(0.000442)	(0.000655)
Macroeconomic variables				
Unemployment rate	0.00782***	0.00283**	0.00430***	0.00297***
	(0.00129)	(0.00128)	(0.000508)	(0.000763)
CPI	1.59e-05	-0.00387***	0.00153***	0.00200***
	(0.000278)	(0.000267)	(0.000108)	(0.000144)
ifo	-0.000783***	-8.55e-05	-0.000540***	0.000183**
	(0.000136)	(0.000141)	(6.12e-05)	(8.42e-05)
Constant	0.385***	0.817***	-0.0813***	-0.218***
	(0.0325)	(0.0323)	(0.0128)	(0.0184)
Observations	175,617	175,617	175,617	175,617
F-statistic	733.45	440.75	107.12	514.04
(p-value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.0548	0.0349	0.0100	0.0423

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Due to the low p-value of the F-test of overall significance of the model (p-value equals 0.000), we reject the null hypothesis and conclude that our model provides a better fit than the intercept-only model. However, the rather low R-squared reveals some variation is left that cannot be explained by the model. This hints at some omitted variables, thus supporting the use of an instrumental variable approach. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

Table A3: Linear Probability Model – Media Coverage and Voting Intention

VOTING/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.289***			
	(0.0234)			
SPD		0.262***		
		(0.0202)		
FDP			0.210***	
			(0.00734)	
Gruene				0.113***
				(0.0152)
Individual Variables				
Age	0.0114***	-0.00153***	-0.000387	-0.00539***
	(0.000488)	(0.000438)	(0.000243)	(0.000302)
Education	-0.00109	-0.0238***	0.0126***	0.0558***
	(0.00141)	(0.00132)	(0.000693)	(0.000948)
Confession	0.131***	-0.0700***	-0.00247**	-0.0242***
	(0.00224)	(0.00205)	(0.00111)	(0.00144)
Married	0.0237***	0.00271	0.000514	-0.00464***
	(0.00226)	(0.00209)	(0.00114)	(0.00151)
Female	-0.0123***	0.0190***	-0.0214***	0.0399***
	(0.00228)	(0.00209)	(0.00113)	(0.00157)
Unemployed	-0.0334**	0.00818	-0.0178***	-0.00792
	(0.0131)	(0.0150)	(0.00609)	(0.00970)
Labour union	-0.107***	0.109***	-0.0282***	0.0168***
	(0.00305)	(0.00341)	(0.00143)	(0.00226)
Assessment of economic situation	-0.0256***	-0.0320***	0.00387***	-0.0142***
	(0.00183)	(0.00164)	(0.000904)	(0.00117)
Own economic situation	-0.0531***	-0.0117***	-0.00698***	-0.00135
	(0.00165)	(0.00159)	(0.000870)	(0.00113)
Political interest	-0.0188***	-0.0234***	-0.0120***	-0.0188***
	(0.00116)	(0.00109)	(0.000589)	(0.000770)
Macroeconomic variables				
Unemployment rate	0.0146***	-0.0116***	0.00800***	-0.00360***
	(0.00135)	(0.00127)	(0.000693)	(0.000846)
CPI	0.000204	-0.00787***	0.00271***	0.00291***
	(0.000287)	(0.000277)	(0.000154)	(0.000162)
ifo	-0.00204***	7.57e-05	-0.00186***	0.00105***
	(0.000141)	(0.000142)	(8.44e-05)	(0.000103)
Constant	0.556***	1.365***	-0.0381**	-0.298***
	(0.0335)	(0.0336)	(0.0180)	(0.0206)
Observations	175,617	175,617	175,617	175,617
F-statistic	652.19	352.44	225.96	647.91
(p-value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.0475	0.0297	0.0209	0.0517

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Due to the low p-value of the F-test of overall significance of the model (p-value equals 0.000), we reject the null hypothesis and conclude that our model provides a better fit than the intercept-only model. However, the rather low R-squared reveals some variation is left that cannot be explained by the model. This hints at some omitted variables, thus supporting the use of an instrumental variable approach. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

Table A4: Linear IV Estimation – Media Coverage and Party Affiliation

PARTY AFFILIATION/ VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.0501			
	(0.0650)			
SPD		0.0137		
		(0.0651)		
FDP			0.118***	
			(0.0109)	
Gruene				-0.0777*
				(0.0399)
Individual Variables				
Age	0.0161***	0.00533***	6.20e-05	-0.00428***
	(0.000462)	(0.000433)	(0.000190)	(0.000256)
Education	-0.00337**	-0.0297***	0.00890***	0.0470***
	(0.00133)	(0.00131)	(0.000517)	(0.000799)
Confession	0.142***	-0.0920***	-0.00587***	-0.0214***
	(0.00221)	(0.00200)	(0.000822)	(0.00122)
Married	0.0230***	0.00133	-0.00104	-0.00838***
	(0.00214)	(0.00205)	(0.000840)	(0.00130)
Female	-0.0173***	0.0252***	-0.0102***	0.0358***
	(0.00214)	(0.00206)	(0.000838)	(0.00135)
Unemployed	-0.0388***	0.0105	-0.00453	-0.00826
	(0.0123)	(0.0151)	(0.00496)	(0.00820)
Labour union	-0.105***	0.124***	-0.0173***	0.0145***
	(0.00284)	(0.00339)	(0.00100)	(0.00192)
Assessment of economic situation	-0.0162***	-0.0194***	0.00152**	-0.0101***
	(0.00178)	(0.00165)	(0.000671)	(0.00101)
Own economic situation	-0.0457***	-0.00508***	-0.00359***	0.00155
	(0.00160)	(0.00161)	(0.000647)	(0.000988)
Political interest	-0.0247***	-0.0339***	-0.00722***	-0.0129***
	(0.00113)	(0.00110)	(0.000443)	(0.000655)
Macroeconomic variables				
Unemployment rate	0.00825***	0.00265**	0.00422***	0.00163*
	(0.00142)	(0.00134)	(0.000508)	(0.000881)
CPI	-0.000173	-0.00396***	0.00182***	0.00214***
	(0.000374)	(0.000332)	(0.000133)	(0.000153)
ifo	-0.000764***	-1.48e-05	-0.000509***	0.000209**
	(0.000138)	(0.000213)	(6.06e-05)	(8.50e-05)
Constant	0.393***	0.817***	-0.109***	-0.231***
	(0.0341)	(0.0323)	(0.0143)	(0.0193)
Observations	175,617	175,617	175,617	175,617
F-statistic	734.52	440.55	102.92	513.41
(p-value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Centered R-squared	0.0548	0.0349	0.0097	0.0418

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The high F-statistic of overall significance leads to a clear rejection of the null hypothesis confirming that the model better fits the data than an intercept-only model. The results and interpretation of the diagnostic tests for the excluded instruments are described in section 4.3. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).

Table A5: Linear IV Estimation – Media Coverage and Voting Intention

VOTING VARIABLES	(1) CDU	(2) SPD	(3) FDP	(4) Gruene
Reports S_{t-1}^{j}				
CDU/CSU	0.176***			
	(0.0681)			
SPD		0.351***		
		(0.0668)		
FDP			0.333***	
			(0.0151)	
Gruene				-0.141***
				(0.0467)
Individual Variables				
Age	0.0114***	-0.00155***	-0.000373	-0.00545***
	(0.000488)	(0.000438)	(0.000243)	(0.000303)
Education	-0.00104	-0.0238***	0.0125***	0.0559***
	(0.00141)	(0.00132)	(0.000694)	(0.000948)
Confession	0.131***	-0.0699***	-0.00269**	-0.0242***
	(0.00224)	(0.00205)	(0.00111)	(0.00144)
Married	0.0237***	0.00270	0.000495	-0.00462***
	(0.00226)	(0.00209)	(0.00114)	(0.00152)
Female	-0.0123***	0.0190***	-0.0213***	0.0397***
	(0.00228)	(0.00209)	(0.00113)	(0.00157)
Unemployed	-0.0338***	0.00833	-0.0169***	-0.00772
	(0.0131)	(0.0150)	(0.00612)	(0.00970)
Labour union	-0.107***	0.109***	-0.0280***	0.0166***
	(0.00305)	(0.00341)	(0.00143)	(0.00226)
Assessment of economic situation	-0.0251***	-0.0318***	0.00405***	-0.0132***
	(0.00187)	(0.00164)	(0.000904)	(0.00118)
Own economic situation	-0.0530***	-0.0116***	-0.00744***	-0.00136
	(0.00165)	(0.00159)	(0.000872)	(0.00113)
Political interest	-0.0188***	-0.0234***	-0.0122***	-0.0189***
	(0.00116)	(0.00109)	(0.000591)	(0.000772)
Macroeconomic variables				
Unemployment rate	0.0157***	-0.0110***	0.00776***	-0.00675***
	(0.00149)	(0.00134)	(0.000692)	(0.000994)
CPI	-0.000264	-0.00759***	0.00359***	0.00323***
	(0.000391)	(0.000346)	(0.000191)	(0.000174)
ifo	-0.00199***	-0.000154	-0.00176***	0.00111***
	(0.000143)	(0.000220)	(8.27e-05)	(0.000104)
Constant	0.576***	1.364***	-0.120***	-0.329***
	(0.0351)	(0.0336)	(0.0203)	(0.0215)
Observations	175,617	175,617	175,617	175,617
F-statistic	644.02	345.63	204.08	645.22
(p-value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Centered R-squared	0.0474	0.0296	0.0193)	0.0500

Robust and clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The high F-statistic of overall significance leads to a clear rejection of the null hypothesis confirming that the model better fits the data than an intercept-only model. The results and interpretation of the diagnostic tests for the excluded instruments are described in section 4.3. According to the *Politbarometer*-survey, political interest is scaled from 1 to 5 (1 equals a very strong interest, 5 equals no interest); economic situation and own economic situation are scaled from 1 to 5 (very good to very bad).