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Asymmetric Perceptions of the Economy: Media, Firms,Consumers, and Experts

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Asymmetric perceptions of the economy:

Media, firms, consumers, and experts[1]

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Abstract

This article sheds light on the interaction of media, economic actors, and economic experts. Based on a unique data set of 86,000 news items rated by professional analysts of Media Tenor International and survey data, we first analyze the overall tone of the media, consumers', firms', and economic experts' opinions on the state and outlook of the economy. Second, we assess the protagonist's ability at correctly predicting GDP. Third, we use Granger causality tests to uncover who is influencing whom when it comes to the formation of opinions on the economy. We find that media reports have a significant negative bias. The economic sentiment of the media, consumers and firms does not reflect the actual situation. Finally, we find that media sentiment is not influenced by any other actor. In contrast, media appear to affect all other actors.

Key words: media bias; consensus forecasts; consumer and business sentiment.

JEL codes: E32; E37; L82.

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1. Introduction

The concept of media bias is analyzed from many perspectives; the basic notion relating to a distorted representation of "real-world" conditions (*distortion bias*, Entman, 2007). From the perspective of communication science, a large number of studies focus on the impact of editorial slant on political processes, maintaining that "news favors one side rather than providing equivalent treatment to both sides in a political conflict (*content bias*)" (Entman, 2007). There is widespread evidence that news media editorial positions influence media content and this, in turn, impacts voters' attitudes and decisions, e.g., Druckman and Parkin (2005). From this perspective media bias can be traced back not only to ideological preconceptions of journalists but also to the influence of competition between media businesses, insofar as taking a partisan stance can be a sensible business strategy (Bernhardt, Krasa, and Polborn, 2008). Measuring editorial slant is controversial, with, e.g., expert opinion related to individuals' political stances (Groseclose and Milyo, 2005).

As media coverage is shaped by editorial decisions in the production process of media content, media bias flowing from the editorial decisions (*decision bias*, Entman, 2007) can affect the selection of news, the evaluation of the protagonists and the described developments as well as the framing of the reported events. Conceptions of media bias are, therefore, related to several theories of media effects that address the perception of the importance of topics – agenda-setting (Coleman, McCombs, and Shaw, 2009)'; the tonality of reporting – defined as second level agenda-setting (Weaver, McCombs, and Shaw, 2004); and the way certain "facets of events or issues" are highlighted, while other aspects are downplayed (Entman, 2004), which can then be traced back not only to editorial positions but also to production routines. There is extensive evidence that media coverage can structure the perception of electoral candidates with regard to the categories, by which they are judged by the public, with the media "priming" the electoral decisions (Pan and Kosicki, 1997).

From a wider perspective, the concept of media bias can be related as well to the phenomenon of "negativism." News is proverbially "inherently negative," as maintained by the theory of news factors (Staab, 1990). However, the focus on potentially negative or dangerous developments can also be traced back to a general asymmetry of good and bad news both at the level of media content and in the way information is processed by individuals (Soroka, 2006). Economic coverage is observed to be mostly negative over time and cross-country (Brettschneider, 2000 and Ju, 2008). This observation, in turn, relates back to the impact of media coverage on political decisions. Based on the economic theory of voting, the news selection on the economy and the framing of economic development can potentially have a big influence on elections (Sheafer, 2008).

From an economic perspective, a growing literature employs media data to explain economic sentiment. For Nadeau et al. (2000) and Soroka (2006), the assessment of the state of the economy depends at least in parts on the media reporting. Doms and Morin (2004) show that there is clear

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evidence that economic coverage influences the attitudes and decisions of economic decision-makers. Both Goidel and Langley (1995) as well as Doms and Morin (2004) show an impact of media reporting on the consumer climate. Uhl (2010, 2011) uses sentiment data of newspaper and TV-news to forecast US private consumption. The role of media coverage of the economy is also analyzed with regard to its contribution to economic forecasting (Abberger, 2007 Hüfner and Schröder, 2002) and to predict German industrial production (Grossarth-Maticek and Mayr, 2008 and Kholodilin, Thomas, and Ulbricht, 2014).

A contingent distortion bias in media coverage of the economy has, therefore, a potentially strong impact both on economic activity and political decisions. While there are several possible causes of bias, some countervailing factors – in the sense of "corrective" input – can also be named. Economic forecasting is not only based on observed hard factors, like output or unemployment, but it also takes the expectations of businesses and consumers into consideration. The regular surveys by economic institutes are fed back to the media, as well as the economic projections by government experts and economic institutions. These routine events are highly newsworthy and contribute strongly to the media coverage of economic research institutes.

However, as media coverage clearly impacts the perceptions and decisions of individuals in the economic context, possible distortions in reporting the state of the economy and the anticipated developments not only negatively influence the quality of economic forecasts but also contribute to the materialization of the predicted developments. This "self-fulfilling" prophecy phenomenon was observed for the activities of consumers for instance with regard to the 1972 oil shock in Germany (Kepplinger 1978). The shortages that the media predicted led to hoarding of petrol, a run on the filling stations and, ultimately, to severe shortages. In the end, the government was forced to introduce "car-free Sundays."

These observations led to the questions that this contribution seeks to address: A distortion bias in economic news exerts a potentially damaging influence on households and companies that may even affect the forecasts and recommendations of economic experts. Based on the clear evidence of a negative asymmetry of perceptions and media coverage of the state of the economy, we first look for the extent of negativity in media reports, consumer and business confidence, and economic forecasts. In a second step, we analyze how strong these predictions deviated from actual developments. Finally, we look at the question of how the different types of protagonists influenced each other with regard to their assessments of the state of the economy and their forecasts of the development.

The pertinent negativity of economic news leads to the following research questions:

R1:   How negative is media coverage of the economy compared to the perceptions of decision makers and economic experts?

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R2: How much do the predictions of economic development by the media, economic decision makers, and economic experts deviate from real development?

R3: How strong is the influence of media coverage on the perceptions of the economy by economic decision makers and economic experts compared to the influence of these groups on each other and on media content?

In order to answer these questions, we track German consumer confidence, business sentiment, and forecasts by economic experts, comparing the expectations with the coverage of the economy by opinion-leading media for a period of 14 years and analyze the patterns of predictive power.

The second section presents the data and the methodology, third section shows the results, and the last section concludes.

2. The data and methodology
2.1. The data

The media indicators are a result of a content analysis of the economic coverage of opinion-leading German TV and print media by the Swiss-based Media Tenor International institute. News coverage was analyzed by human coders using a codebook that includes references to the protagonist (politicians, entrepreneurs, managers, celebrities, etc.) and institutions (political parties, companies, football clubs, etc.), topic (unemployment, inflation, etc.), region of reference (i.e., Germany, EU, USA, UK, BRIC, worldwide), time reference (past, present, and future), source of information (journalist, politician, expert, etc.), as well as with regard to the tone of the information (negative, no clear tone, or neutral).[6] News items referring to 336 topics unified in 54 more general topic groups were analyzed over the period from January 1, 2001 through January 31, 2015. Overall, there are 86,367 news items in the data set.[7] This news comes from 8 media sources, including five TV news shows (heute, heute journal, RTL Aktuell, Tagesschau, Tagesthemen) and three print media in the form of one newspaper (Bild-Zeitung) and two magazines (Focus, and Spiegel). TV news shows are analyzed entirely, while print media analysis is limited to the politics and business sections.

Based on the ratings, we compute media indices as the differences between the percentage share of the positive ratings and that of the negative ratings:

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[6] Media Tenor International employs professional coders to carry out media-analysis. Only coders that achieved a minimum reliability of 0.85 are cleared for coding. That means that the coding of these coders deviate at most by 0.15 from the trainers' master-versions. The reliability of the coding is checked on an ongoing basis both with quarterly standard tests and random spot checks. For each month and coder, three analyzed reports are selected randomly and checked. Coders scoring lower than 0.80 are removed from the coding process. In none of the months the mean deviation among all coders was above 0.15.

[7] See Table 1 for a detailed description of the structure of the analyzed media set.

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$$B_{i,j,t} = 100 \times \frac{A_{i,j,t}{}^+ - A_{i,j,t}{}^-}{A_{i,j,t}{}^+ - A_{i,j,t}{}^- + A_{i,j,t}{}^0} \,, \tag{1}$$

Where $A_{i,j,t}{}^+$ is the number of positive ratings of medium reports about events happening in the time i in the country j published in period t, $A_{i,j,t}{}^-$ is the number of negative ratings, and $A_{i,j,t}{}^0$ is the number of neutral rankings. The index varies between -100 (all reports are rated negatively) and 100 (all reports are rated positively). We consider two types of media indicators. The first one only uses the ratings that refer to the current situation and reflects the assessment of the current economic situation. The second one only uses reports that are related to events happening in the future, reflecting expectations inherent in the media.

Consumer confidence: We measure consumer confidence in Germany using two European Commission indicators: 1) general economic situation over last 12 months (which can be considered as a measure of past and present economic situation from the standpoint of households) and 2) general economic situation over next 12 months (which can be treated as households' expectations about the near future). The data are monthly starting in January 1985 and ending in February 2015.[8]

Business confidence: The Ifo Institute for Economic Research in Munich asks firms working in manufacturing, construction, wholesaling and retailing to assess 1) business situation (evaluation of the current state of affairs) and 2) business expectations (the expected changes in state of affairs within the next six months). Both series are monthly and cover the period from January 1991 through February 2015.[9]

Economic experts: The opinions of experts are based on forecasts made by individual forecasters and collected in form of surveys by Consensus Economics[10] (January 1989 till May 2010) and Focus Economics[11] (June 2010 till December 2014). The forecasts are published on a monthly basis and refer to the annual growth rates of real GDP in the current and the next year. For each forecaster, a deviation between its forecast, F_{it}, and the actual growth rate as reflected in the most recent available vintage of national accounts data is computed, Y_{it}: $D_{it} = F_{it} - Y_{it}$.[12] Based on the sign of the deviation, the forecasters are divided into two groups: 1) "pessimistic" if $D_{it}<0$ and 2) "optimistic", otherwise. The expert sentiment is then constructed as a difference between the percentage share of optimists and pessimists. In such a way, we arrive at the sentiment indicators that can be compared to those for consumers and businesses.

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[8] For more details see http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm.
[9] See http://www.cesifo-group.de/ifoHome/facts/Time-series-and-Diagrams/Zeitreihen/Reihen-Geschaeftsklima-Deutschland.html.
[10] http://www.consensuseconomics.com.
[11] http://www.focus-economics.com.
[12] Statistisches Bundesamt (2015) Volkswirtschaftliche Gesamtrechnungen. Inlandsproduktsberechnung Vierteljahresergebnisse. 4. Vierteljahr 2014. Stand: Februar 2015.

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2.2. The methodology

The media, consumers, and companies do not make explicit forecasts. However, the implicit forecasts can be deduced in the following way: If the value of the expectations, E_t, at time t exceeds (is lower than) the value of the assessment of the current situation, A_t, this implies an improvement of the economic situation, which is equivalent to positive (negative) GDP growth. Therefore, the forecasts computed here merely represent sign forecasts, resulting in $F_t = 1$, if $E_t > A_t$ reflecting a forecast of a positive GDP growth, and in $F_t = -1$, if $E_t < A_t$ reflecting a forecast of negative growth.

For the computation of the forecast errors, the corresponding GDP numbers are employed. In doing this, we assume that consumers predict 12 months and firms 6 months ahead as in the surveys they are asked to give their expectations for the next 12 or 6 months, respectively. The forecast horizon of the experts is clearly stated in the Consensus survey: it is the current and the next year. For media, we tested both the 6 months and the 12 months horizon forecast. Here, we report only the 12 months horizon results, as the 6 months horizon forecasts give essentially the same results. Thus, the value of the actual economic development given by the quarterly GDP numbers is recoded accordingly. If the quarterly GDP at the point in time the forecasts are made grows over the subsequent 6 month, it is recoded to 1, if it shrinks it is recoded to -1. If both the forecasts and the recoded GDP take the same values, the sign is correctly predicted, if not, it represents a forecast error. The results are robust to the assumed forecast horizon. If the procedure is implemented using year-on-year growth, the results are essentially the same.

In case of the economic experts, in order to make the results comparable, we report the results of the mere sign forecasts. First, the difference of each single forecast and the real development was calculated. On this basis a new variable was constructed, which become 1, if the expert over-estimates the real development and -1, if the expert underestimates the real development. Then, the balance of overestimations and underestimations was calculated. For economic forecasts the horizon is clearly stated in the consensus survey and is one year.

It is next to impossible to empirically uncover economic causalities. However, Granger (1969) provides a framework for at least testing for a necessary condition of causality. Nevertheless, Granger causality should not be confused with a true causality: if a variable Granger causes another variable, it implies that it is useful for the forecasts of the latter but not necessarily causes it. Let t be a time index. If one variable y_t is Granger caused by another variable x_t, both variables need to be correlated and changes of x_t should precede changes of y_t. This can easily be tested by regressing y_t on its own lagged values (to account for autocorrelation) and lags of x_t. If lags of x_t, are significant, while lags of y_t are not significant in the corresponding regression of x_t, on lags of y_t and x_t, x_t is said to Granger cause y_t. Thus, the null hypothesis that x_t does not Granger cause y_t is tested using the following expression:

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$$y_t = \gamma + \alpha_1 y_{t-1} + + \alpha_j y_{t-j} + \beta_1 x_{t-1} + \cdots + \beta_l x_{t-l} + \epsilon_t, \qquad (2)$$

where j and l are the maximum lag lengths of y_t and x_t, respectively; and α, β, and γ are regression coefficients. In order to improve upon the standard approach, gaps in the lag structure are allowed, as well, determining significance using Bayesian model averaging (Kass and Raftery, 1995). This means that it is not only tested for lags, e.g., $j = 5$, versus $j = 4$. Here, gaps in the lag sequences are allowed and each possible combination of lagged y_t and x_t, values are possible.

3. Results

3.1. Negativity of media coverage of the economy in comparison to the perceptions by decision makers and economic experts

In Table 2 the assessment of the current state of the economy/expectations is displayed from different protagonists' perspectives. It includes news coverage on the state for the economy in the media, companies' confidence index, consumers' confidence index, and economic experts' forecasts.

For the analysis the mean values for the period between January 2001 and February 2015 are calculated. The values in the table show the balance of positive assessment and negative assessments in percent.

With respect to the media coverage we differentiate between the time reference (past/present/future) as well as between the region of reference (Germany and rest of the world).

All actors, except for the economic experts, are characterized by a markedly negative perceptions of the economy, with media coverage being most pronouncedly negative. During the period under study, German opinion leading media were more negative with respect to the rest of the world than to Germany and more negative with respect to the present in comparison to the past and the future. With respect to the current economic situation in Germany the balance of positive and negative reports is -24.7%, while regarding the future economic situation the prevalence of the negative opinions is much smaller with -14.2%.

A similar pattern is observed for consumer confidence index: the balance of the positive and negative assessment is -17.7% when concerning past and present, but -11.0% when referring to future development. Thereby, consumers are a little bit less negative than the media.

A different picture emerges when the sentiment of the companies is considered: Both the assessment of the situation and the expectations for the future are nearly balanced. With respect to the current situation, the balance of positive and negative assessments is with -0.5% slightly negative. When it comes to the expectations the value becomes -2.1%. Thus, German companies are neither particularly optimistic nor pessimistic about the current situation or the near future.

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Much more optimism can be seen in the forecasts of economic experts: The balance of the over- and underestimations is 10.2% when it comes to the current economic situation and 23.7% when the future development is concerned. Economic experts seem to be rather optimistic, especially when it comes to predicting the future.

Focusing on the time series displayed in Figure 1, one can see that both consumer confidence and company confidence fully recovered after the financial crisis (2008-2009) in the 2010 and 2011, while experiencing a downswing in 2012 and 2013. By 2014, confidence is again positive. In contrast, media coverage of the economy has not recovered permanently from the impact of the financial crisis of the years 2008-2009 and reverted to an overall negative tone in the years 2013-2014.

While expectations of companies and consumers are consistently more positive than the assessment of the present, media coverage of the future has been more positive than reports on the present only for the period before the year 2011. Apparently, this pattern results from the intensive coverage of the Greek debt crisis, which has been more prominent than other news on foreign economies due to its political implications.

3.2. Deviation of the predictions by the media, decision-makers, and economic experts from real development

Another interesting outcome of the financial crisis is seen in Figure 2: While reports on Germany were aligned to reports on the rest of the world until the inception of the financial crisis in 2007, after that media coverage on Germany was significantly more positive than for other countries. This can be explained by a more favorable shape of German economy compared to other countries, particularly those EU member states facing recently an economic slowdown. Moreover, media reports about the political reaction to the challenges of the banking crisis and, later on, the rescue of the highly indebted countries in Southern Europe, have emphasized the situation outside of Germany.

Table 3 shows the results for all four groups of actors: the media, firms, consumers, and economic experts. It presents the mean prediction error, the percentage of time the forecasts were too positive, too negative, and correct. One (two) stars indicate significance at the 5% (1%) level, according to the Wilcoxon (1945) sign rank test, which tests the null hypothesis of the errors having a mean of zero against the alternative of having a positive or negative bias (one-sided tests).

The mean error of the implicit forecasts of media, firms, and consumers is negative; that is, the three actors systematically underpredict growth. The percentage of negative errors is relatively large and it is significant for firms and consumers giving values of 42% and 53%, respectively. However, the bias is very small and not significant for media. The percentage of correct forecasts ranges between 42 and

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53%. Thus, only in the case of media they are slightly better than flipping a coin. In contrast to the aforementioned results, experts, represented by the Consensus forecast, have a positive error revealing overly optimism in about 15% of the forecasts made. The bias is significant at the 1% level. Looking at the percentage of correct answers, the experts are by far more accurate in predicting the evolution of GDP.

3.3. Estimating the influence of media coverage on the perception of decision makers and economic experts

Table 4 and 5 in the appendix give the regression results of the pairwise regression for those equations for which Granger causality was found. Figure 3 shows the Granger causalities between the media, consumer, business, and expert indices of the current situation and expectations as single-headed arrows. The heads point in the direction of causality. Thus, x → y means that x is Granger causing y. Two-sided arrows indicate that both variables are mutually Granger causing. The Granger causalities demonstrate multiple connections between the analyzed time series, as information about economic activity flows not only directly to the individual decision-makers but also indirectly through the media, involving feedback processes. Strikingly, both media variables are not Granger caused by any other actor's opinions. However, media assessment of the current situation Granger causes the assessment of current situation and future expectations by forecasters and consumers as well as the evaluation of the current situation by businesses. Future expectations of media only Granger cause consumer expectations in the way they assess the current situation and future developments. In addition, consumer expectations and assessment of the current situation by firms are Granger caused exclusively by media sentiment. Interestingly, the media sentiment appears to be not influenced by any other actor.

It is noteworthy that the business expectations are only Granger caused by the business assessment of the current situation and by the consumer expectations. Neither media nor economic experts appear to exert an impact upon the formation of expectations by the firms.

4. Discussion

This paper examines the sentiment of consumers, companies, economic experts, and the media over the period between January 2001 and February 2015. The results are the following:

First, all timelines, aside from that of the economic experts, are characterized by a marked overall surplus of negative descriptions of the economy, with media coverage being most pronouncedly negative on both the current situation and on future development. A similar result is shown by the consumer confidence index, with little less negativity than in the media. A different picture is given by the assessments of the companies and economic experts. Whereas both the assessment of the situation and the expectations for the future of the companies are nearly balanced, the assessments and forecasts of economic experts seem to be rather optimistic, especially when it comes to future development.

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Second, economic experts deserve their title: in comparison to consumers, companies, and the media, expert's assessments and forecasts are much more often correct. In 84% of the cases they are right. All others (media, consumers, and companies) achieve an accuracy of around 50%, which is as accurate as flipping a coin.

Third, the analysis of Granger causality demonstrates multiple connections between the assessments and the expectations of the groups analyzed. Nevertheless, media coverage of the economy, both with regard to the present and the future, is not Granger caused by any of the confidence indicators or the experts' forecasts.

The study confirms not only the assumption of a basic asymmetry in economic news but underscores the role of negativism as a basic element of media bias. This distortion bias exerts a possible strong influence on economic decisions, as our analysis confirms hypotheses of a strong media influence on attitudes and behavior of economic decision makers.

The results confirm several long-standing assumptions of communications research. The disconnections between assessments of the personal economic situation and the assessment of the overall state of the economy observed in opinion polls can be traced back to the impact of the media that inform consumers about economic trends outside of their personal experience. Moreover, the overall tonality of media coverage on the economy influences as well the assessments of decision makers in the business world, whose assessment of opportunities and risks seems to be not exclusively dominated by their order books. The tone of economic news affects the overall framing of the information available on the individual level.

While consumers and companies are affected more directly by the media coverage, the forecasts of economic experts are indirectly affected, as the confidence indices are utilized both systematically as statistical input and in the context of economic news.

Economic news varies strongly in terms of both tonality – notwithstanding the strong overall negativity – and volume. Negativity is partially driven by the news value of bad news, but also by the communications of interest groups and institutions, which are potentially interested in highlighting problems and demands for action with regard to their own goals, like, e.g., environmental activists, trade unions, or charities. In the last decade of the 20th century, unemployment, for instance, was consistently labelled as the most urgent problem by politicians and was, accordingly, invariably at the top of the polls on the most important problem facing the community.[13] In this context, information offered by economic experts not only plays a minor role in terms of salience, but may also be used by journalists in a selective way.

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[13] Faas & Rattinger (2003) interpret this relationship in a reverse way, with opinion polls motivating politicians to address unemployment in their political rhetoric.

The results of the study suggest a strong distortion bias of economic uses with potential adverse consequences for decision-making both in the economy and in the politics.

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Appendix:

Table 1: Analyzed media set:

TV-program/Print medium	Number of news items analyzed
TV-news shows	
ARD Tagesschau	12,146
ARD Tagesthemen	15,847
ZDF heute	10,600
ZDF heute journal	16,394
RTL Aktuell	6,167
Weekly magazines	
Spiegel	5,786
Focus	8,082
Daily newspaper	
Bild-Zeitung	11,345
Total	**86,367**

Table 2: Assessment of the state of the economy/expectations of different protagonists, %

Protagonists	Measurement	Location	Past	Present	Future
Media	News coverage	Rest of world	-36.3***	-43.2***	-25.8***
		Germany	-17.4***	-24.7***	-14.2***
Consumers	Confidence index	Germany	-17.7***		-11.0***
Companies	Confidence index	Germany		-0.5	-2.1**
Experts	Forecast accuracy	Germany		10.2	23.7***

Note: *** (**) stands for statistical significance at 1% (5%) level.

Table 3: "Forecast errors" of media, consumer, companies, and economic experts

|	Mean error	% of positive errors	% of negative errors	% of correct forecasts
Media	-0.04	22	25	53
Consumers	-0.18	18	36**	47
Companies	-0.26	16	42**	42
Experts	0.14	15**	1	84

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Table 4: Granger causality, regression results

Endogenous	X1	X2	X1(-1)	X1(-2)	X1(-3)	X1(-4)	X1(-5)	X1(-6)	X1(-7)	X1(-8)	X1(-9)	X1(-10)	X1(-11)	X1(-12)	X2(-1)	X2(-2)	X2(-3)	X2(-4)	X2(-5)	X2(-6)	X2(-7)	X2(-8)	X2(-9)	X2(-10)	X2(-11)	X2(-12)
X1	Cons_expectation	Cons_situation	1.07**				-0.22**															0.19**		
X2	Cons_expectation	Cons_situation	0.3**	-0.27**		-0.1*								1.06**									-0.18**	-0.08**
X1	Ifo_situation	Cons_situation	1.1**		0.3**	-0.43**																		-0.07**
X2	Ifo_situation	Cons_situation	0.38**			-0.24**								0.88**										
X1	Ifo_situation	Cons_expectation	1.03**	0.31**	-0.35**										0.91**									-0.07**
X2	Ifo_situation	Cons_expectation	0.24**			-0.16**																		
X1	Ifo_expectation	Cons_situation	1.31**	-0.25**										0.96**										-0.06**
X2	Ifo_expectation	Cons_situation	0.50**	-0.28**										0.84**			-0.33**							
X1	Ifo_expectation	Cons_expectation	1.14**			-0.27**				0.07*														
X2	Ifo_expectation	Cons_expectation	0.49**	-0.29**																				
X1	Ifo_expectation	Ifo_situation	1.42**	-0.53**										0.32**	-0.33**									
X2	Ifo_expectation	Ifo_situation	0.32**		-0.43**	0.26**								0.81**		0.51**	-0.38**							
X1	Consensus_situation	Cons_situation	0.91**											1.16**			-0.19**			-0.01**				
X2	Consensus_situation	Cons_situation												1.16**			-0.19**							
X1	Consensus_situation	Ifo_situation	0.92**											1.31**	-0.25**				0.02**	-0.02**				
X2	Ifo_situation	Ifo_situation	1.72**	-1.75*	-1.94**	1.94**								1.11**			-0.26**		-0.02**		0.27**			-0.21**
X1	Consensus_situation	Ifo_expectation	0.87**											0.01**		0.30**	-0.43**						-0.01**	
X2	Consensus_situation	Ifo_expectation	0.89**											1.1**										
X1	Consensus_situation	Cons_situation	0.66**											1.31**	-0.25**								-0.01**	
X2	Consensus_situation	Cons_situation	0.66**											0.15**			-0.14**		-0.01**				
X1	Consensus_expectation	Consensus_situation	0.8**		0.3**		0.20**		0.26**					0.38**	0.68**		-0.14**						-0.09**	
X2	Consensus_expectation	Consensus_situation												1.16**			-0.19**							
X1	Consensus_expectation	Ifo_expectation	0.58**											0.3**	0.03**	-0.03**							-0.02**	
X2	Consensus_expectation	Ifo_expectation												1.31**	-0.25**		-0.14**							
X1	Consensus_expectation	Ifo_situation	0.62**											0.17**							-0.01**		-0.16**	
X2	Consensus_expectation	Ifo_situation	0.88*											1.05**		0.31**	-0.38**							
X1	Consensus_expectation	Cons_expectation	0.55**						-0.07**					1.1**			-0.23**			0.20**			-0.16**	
X2	Consensus_expectation	Cons_expectation	0.10**											1.16**										
X1	MN_situation	Cons_situation	0.55**		0.27**									1.04**							-0.08***			
X2	MN_situation	Cons_situation	0.55**		0.3**									1.04**			-0.14**						-0.09**	
X1	MN_situation	Cons_expectation	0.11**	-0.07*										1.04**			-0.15**							
X2	MN_situation	Cons_expectation	0.55**		0.27**																			
X1	MN_situation	Ifo_situation	0.55**		0.27**																			
X2	MN_situation	Ifo_situation																						
X1	MN_situation	Consensus_situation	0.55**		0.27**									-0.04*	1.07**	0.30**	-0.39**							
X2	MN_situation	Consensus_situation	0.27**											-0.01*	0.93**									

Note: This table shows the pairwise OLS regressions for testing for Granger causality, (-L) indicates a lag of L, * indicates significance at the 5 percent, and ** at the one percent level. The specification is selected using Bayesian model averaging.

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Table 5: Granger causality, regression results (continued)

| Endogenous	X1	X2	X1(-1)	X1(-2)	X1(-3)	X1(-4)	X1(-5)	X1(-6)	X1(-7)	X1(-8)	X1(-9)	X1(-10)	X1(-11)	X1(-12)	X2(-1)	X2(-2)	X2(-3)	X2(-4)	X2(-5)	X2(-6)	X2(-7)	X2(-8)	X2(-9)	X2(-10)	X2(-11)	X2(-12)
X1	MfT_situation	Consensus_expectation	0.55*																							
X2	MfT_situation	Consensus_expectation			0.27**								-0.01**		0.68***											0.14**
X1	MfT_expectation	Cons_situation	0.39**	0.26**																						
X2	MfT_expectation	Cons_situation	0.05***				-0.04*								1.15**			-0.18**								
X1	MfT_situation	Cons_situation	0.39**	0.26**																						
X2	MfT_situation	Cons_situation	0.05*												1.04**								-0.20**			
X1	MfT_all_Konjunktur	Cons_situation	0.75***																							
X2	MfT_all_Konjunktur	Cons_expectation	0.08**				-0.05**								1.12**			-0.16**								-0.17**
X1	MfT_all_Konjunktur	Cons_situation	0.75***		-0.03*																					
X2	MfT_all_Konjunktur	Cons_expectation	0.05*												1**			-0.13**								
X1	MfT_all_Konjunktur	Cons_situation	0.75***																							
X2	MfT_all_Konjunktur	Cons_expectation	0.04**									1**			1.16***	-0.96**								0.23**		
X1	MfT_all_Konjunktur	Ifo_situation	0.60**												1.1**	0.3**	-0.43**									
X2	MfT_all_Konjunktur	Ifo_situation																								
X1	MfT_all_Konjunktur	Ifo_expectation	0.58**												0.71**											
X2	MfT_all_Konjunktur	Ifo_expectation													1.31**	-0.25*	-0.14**									
X1	MfT_all_Konjunktur	Consensus_expectation	0.75***									0.00**			0.72**		0.16**									
X2	MfT_all_Konjunktur	Consensus_expectation																								
X1	MfT_all_Arbeitsmarkt	Cons_expectation	0.06***												1.05***			-0.15**								
X2	MfT_all_Arbeitsmarkt	Cons_expectation	0.27**				-0.05*								0.48**											
X1	MfT_all_Arbeitsmarkt	Cons_situation	0.25**				0.25**								0.73**		-1.76** 1.30**	-0.19**								
X2	MfT_all_Arbeitsmarkt	MfT_situation	0.09*			0.19**									0.42**	0.27**			-0.30*							
X1	MfT_all_Arbeitsmarkt	Ifo_situation	0.25**												0.34**											
X2	MfT_all_Arbeitsmarkt	Ifo_situation				0.19*	0.22***								1.10**	0.30** -0.43**										
X1	MfT_all_Arbeitsmarkt	Ifo_expectation	0.19*												0.45**											
X2	MfT_all_Arbeitsmarkt	Ifo_expectation				-0.05**									1.37** -0.43**											
X1	MfT_all_Arbeitsmarkt	Consensus_situation	0.27**	0.20*	0.21*										0.91***											
X2	MfT_all_Arbeitsmarkt	Consensus_situation	0.27**	0.20*							-0.01**															
X1	MfT_all_Arbeitsmarkt	Consensus_expectation	0.27**		0.21**										0.73**											
X2	MfT_all_Arbeitsmarkt	Consensus_expectation			-0.01**										0.41** -0.44** 0.49**										0.11*
X1	MfT_all_Arbeitsmarkt	MfT_situation	0.32**												0.55**	0.27***										
X2	MfT_all_Arbeitsmarkt	MfT_situation																								
X1	MfT_all_Arbeitsmarkt	MfT_expectation	0.27**	0.26**											0.39** 0.28**	0.26**										
X2	MfT_all_Arbeitsmarkt	MfT_expectation			-0.14*																					
X1	MfT_all_Arbeitsmarkt	MfT_all_Konjunktur	0.25**				0.20**								0.65**		0.17**	0.18**								
X2	MfT_all_Arbeitsmarkt	MfT_all_Konjunktur								-0.34**																

Note: This table shows the pairwise OLS regressions for testing for Granger causality. (-L) indicates a lag of L. * indicates significance at the 5 percent, and ** at the one percent level. The specification is selected using Bayesian model averaging.

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**Figure 1: Negative bias of news and confidence indicators**
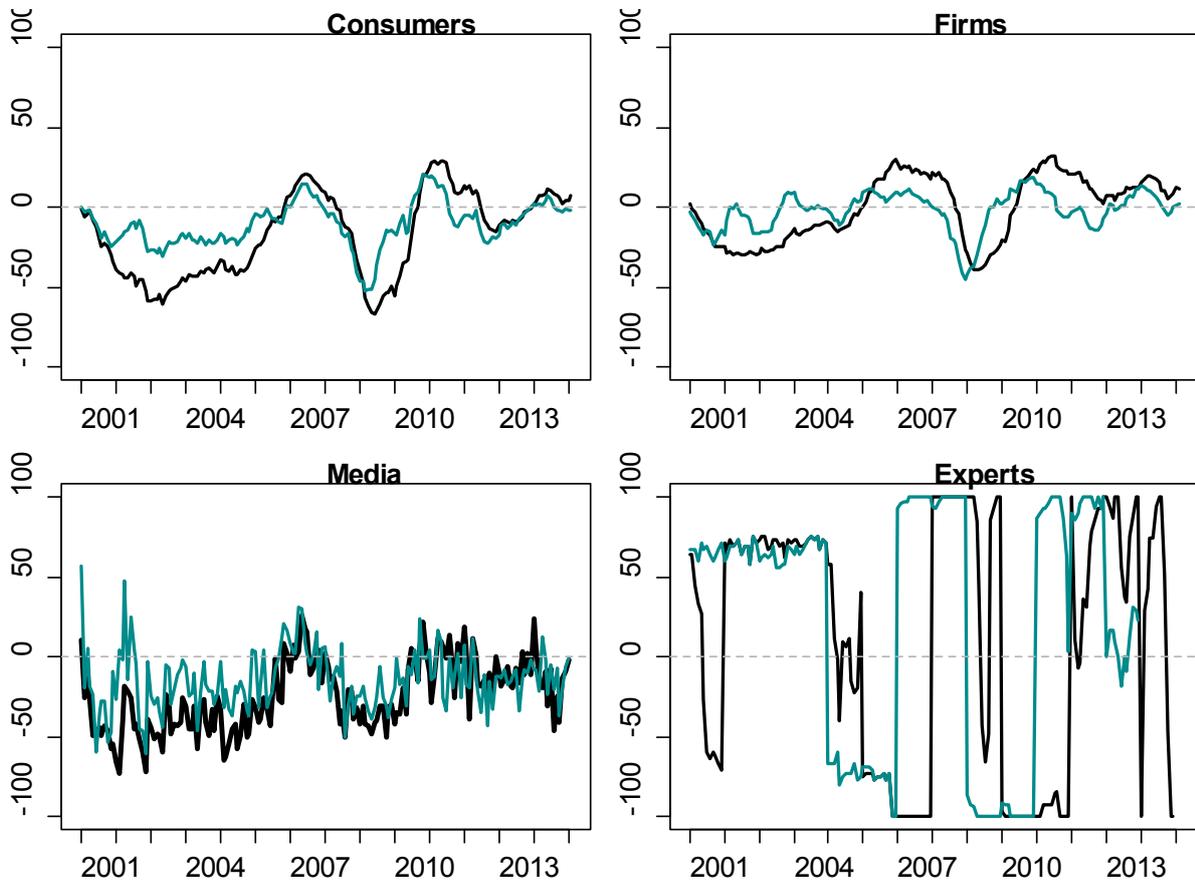
Here, the lines represent the balance of positive and negative sentiment of consumers, firms, media and experts over time, where a value of 100 reflects completely positive and -100 completely negative sentiment.

Figure 2: News coverage of the economy – Germany and the rest of the world
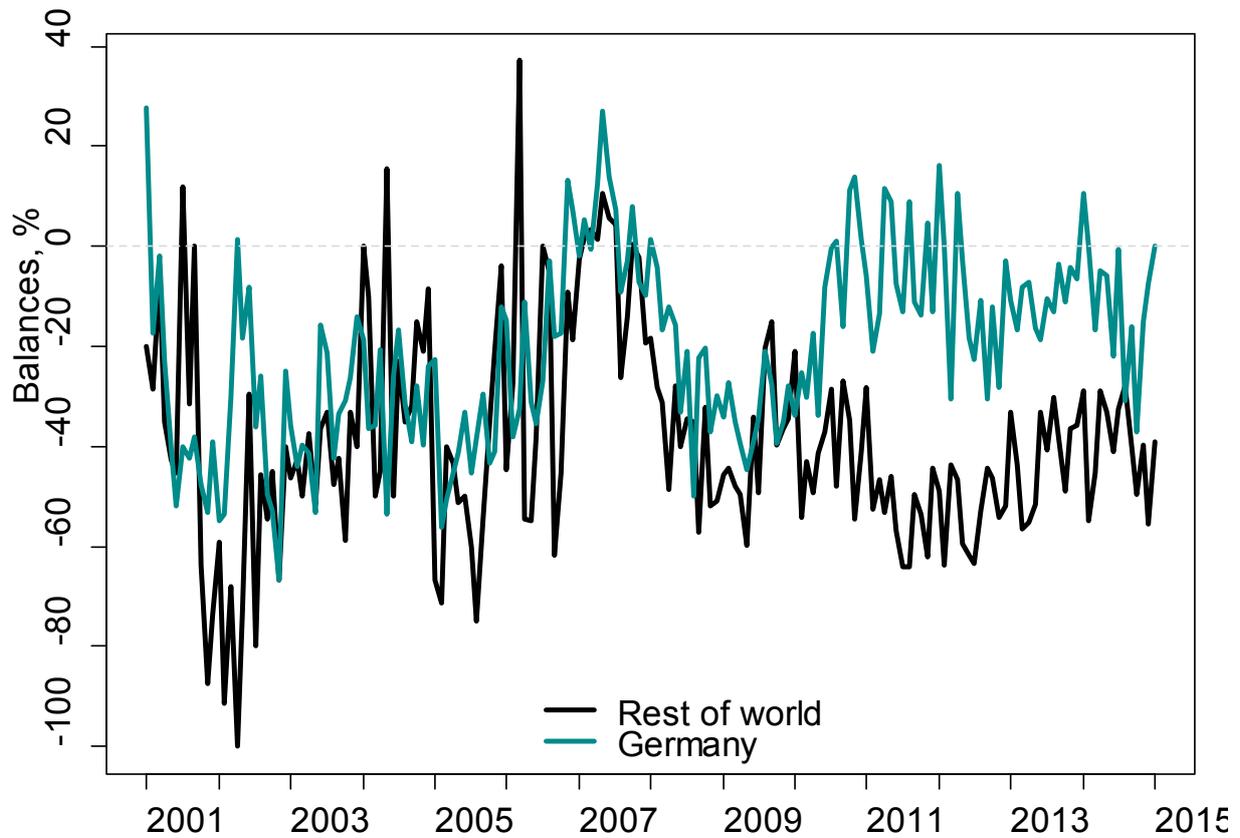
Here, the lines represent the balance of positive and negative sentiment of the media over time, where a value of 100 reflects completely positive and -100 completely negative media sentiment. The green line labeled *Germany* reflects the media sentiment in news reporting about Germany only while the black line labeled *Rest of the World* corresponds to news reporting about events outside Germany.

Figure 3: Granger causalities between the actors
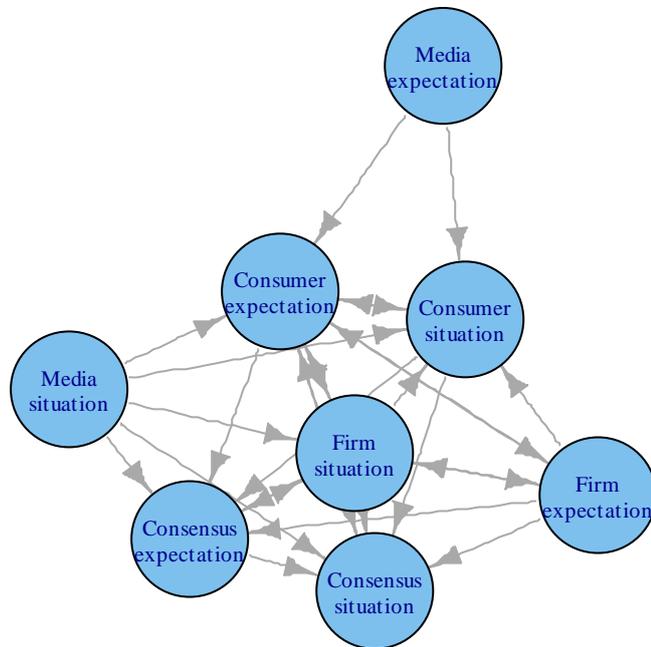
The figure shows the Granger causalities between the media, consumer, business, and expert indices of the current situation and expectations as single-headed arrows. The heads point in the direction of causality. Thus, x → y means that x is Granger causing y. Two-sided arrows indicate that both variables are mutually Granger causing.