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More or less diverse: An assessment of the effect of attention to media salient company types on media agenda diversity in Dutch newspaper coverage between 2007 and 2013

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Abstract

This study on news coverage of highly visible company types in a Dutch daily quality newspaper (*NRC Handelsblad*; $N = 14,363$), during the economic crisis (2007–2013), shows that attention to banks (and to a lesser extent also to the automobile and components industry) had a structural negative influence on media agenda diversity. The majority of the other salient company types had a significant positive impact on diversity. These results suggest that banks attracted attention at the expense of more varied, diverse coverage during the crisis. Our findings extend knowledge of agenda-building

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dynamics in relation to organizational news by considering characteristics of the broader media agenda. We discuss our findings in light of causes and consequences of media coverage of salient businesses.

Keywords

Agenda building, company news, economic crisis, media agenda diversity, time-series analyses, zero-sum

Over the last years, a number of scholars used the ‘classical’ idea of agenda setting, which refers to the transfer of issue salience from the media to the public (McCombs, 2004), to study effects of news about organizations. These scholars examined how media attention to organizations and related attributes can affect the public and other agendas, mainly in terms of organizational reputation (e.g. Carroll and McCombs, 2003; Meijer and Kleinnijenhuis, 2006). Others have used the broader concept of ‘agenda building’, or ‘media agenda setting’ (Denham, 2010), to study how media select and emphasize some organizations and/or issues over others, thereby mainly focusing on the impact of public relations on the news (e.g. Kim et al., 2015; Kioussis et al., 2007; Moon and Hyun, 2014; Ragas et al., 2011). A particular relevant research avenue that remains unexplored by these ‘agenda scholars’ interested in organizations is that of media agenda diversity.

Research in other areas, mainly political communication and policy studies, has examined agenda diversity in the agenda-setting process in depth (Kleinnijenhuis et al., 2015). Zhu (1992) referred to agenda setting as being a ‘zero-sum game’, which means that attention to one agenda object must go at the expense of others, because the ‘carrying capacity’ of agendas is inherently limited (Hilgartner and Bosk, 1988). In effect, agenda formation is characterized by intense competition among agenda objects (e.g. issues or actors), which affects agenda setting (McCombs and Zhu, 1995). Remarkably, few studies have focused explicitly on the underlying dynamics of ‘media agenda diversity’ and how they can be explained. This refers to the way in which agenda building influences the diversity structure of the media agenda, or, in other words, how the journalistic shaping of the agenda in terms of attention to specific objects may influence the diversity pattern of the media agenda.

Seeking to inform the literature on agenda building and agenda diversity, particularly in relation to organizational news, this study investigates the long-term influence of attention to corporations on media agenda diversity during the economic crisis.

Relating to normative ideas about the function of journalism in society, there is a wide consensus that journalists should aim to build and maintain a diverse media agenda. Ideally, a diverse agenda is desirable because it offers comparable opportunities for social actors (in our case companies, critics, and others) to gain media attention. Yet, building a diverse agenda may be challenged in times of crisis. Organizational news is often related to crisis situations, as crises render organizations newsworthy (Kleinnijenhuis et al., 2013). The so-called ‘trigger events’ (Dearing and Rogers, 1996) typically catapult crises on the media agenda, causing focused attention waves in the

news (Nisbet and Huge, 2006). These waves may then lead to a temporal decline of agenda diversity since focused attention to crisis-related objects (e.g. certain corporations) pushes other objects (e.g. other corporations) off the agenda (Kleinnijenhuis et al., 2015). However, day-to-day patterns of fluctuating agenda diversity are common in news reporting (Boydston, 2013). But severe crisis situations, such as global economic crises, may affect agenda diversity negatively on a structural level because these events are capable of sustaining high attention over longer periods of time. The critical question with regard to diversity then becomes *to what extent* long-term attention influences agenda diversity on a structural level?

This study aims to shed light on that question by taking the recent economic crisis as a case in order to examine to what extent long-term media agenda diversity operates in the context of attention to a variety of media salient company types (e.g. transport companies, banks, energy firms), in Dutch economic news between 2007 and 2013. Hereby, focus is on the effect of media attention to *banks* since they have been objects of fierce discussion in news coverage during and after the financial crisis in 2007. In the economic crisis that hit Europe years after that period, banks have been central actors and they have undergone several large waves of attention. This makes them especially relevant to consider in the context of agenda diversity since attention patterns for these organizations might be highly skewed, with periods of large attention going in particular at the expense of the general pattern of diversity.

Media agenda diversity

Media agenda diversity may be used as both a dependent and an independent variable because on a conceptual level it refers to the interplay between agenda building and agenda setting: as journalists create fluctuating diversity patterns on the media agenda, they may in turn influence agenda setting. Zhu (1992) started agenda-diversity research by showing how agenda setting could be seen as a 'zero-sum game, in which the rise of one issue results in the fall of another' (p. 826). It was articulated that

the salience of a particular issue on the public agenda is a function not only of its salience on the media agenda, which is the original agenda-setting hypothesis, but also of the salience of competing issues on both the media and public agendas. (McCombs and Zhu, 1995: 496)

Subsequent studies confirmed this idea to large extent (Kleinnijenhuis et al., 2015). Only recently scholars began to study media agenda diversity explicitly as an effect of how the media agenda is shaped by journalists (Boydston et al., 2014a). In this type of research, agenda media diversity is used as dependent variable.

Media agenda diversity can be conceptualized as the distribution of *attention* among a given set of discrete object categories in a news discourse (Tan and Weaver, 2013). The term objects denotes the same as 'attitude objects' in social psychological research: the things we form opinions about (Carroll and McCombs, 2003). While agenda research is traditionally focused on issues, scholars in corporate communication have also focused on organizations and substantive and affective attributes of organizations. Media agenda diversity may thus have qualitative and quantitative constituents: the *types* of object

categories and the *number* of categories (Peter and De Vreese, 2003). Diversity can theoretically vary between 100 percent concentration on one category (e.g. only banks) to equal dispersion of attention across all categories (Jennings et al., 2011), although such extremes are unlikely to be encountered in the news (Alexandrova et al., 2012).

Entropy

Methodologically, most communication researchers use *entropy* (Shannon and Weaver, 1949) to measure agenda diversity (see Kleinnijenhuis et al., 2015). Here, entropy relates to the distribution of attention scores across a set of selected objects (e.g. a set of corporate types), weighted by the occurrence of those objects (e.g. the amount of mentions or articles in a newspaper on a certain day; Kleinnijenhuis et al., 2015). Entropy is thus a measure to examine the relative dispersion of attention across objects on an agenda. Of course, the categorical themes may vary (e.g. issues, perspectives, or organizations), depending on the topic under study (Boydston et al., 2014a).

Entropy has, among other purposes, been employed as a dependent variable to measure the extent of prioritization of specific objects across a set of general objects on a communication agenda (e.g. Jennings et al., 2011). For example, let us assume that media attention to banks is disproportionately large for one whole news week, when compared to attention to all other company types in that week. Then, attention to banks will have a negative effect on the entropy scores within that specific week: We could say that banks are prioritized in the news that week.

The relation between attention and agenda diversity

Media attention and object prioritization can be conceptualized through the agenda-building approach (see, for example, Kioussis et al., 2009, 2015), which has, among other purposes, also been used to study how crisis events trigger media attention (Denham, 2014). Agenda-building scholars have followed a model by Shoemaker and Reese (1996) that identifies five sorts of influences on news attention: processes related to individual journalists, media organizations, journalistic routines, external events and broader cultural context (Denham, 2010). These influences can be used to briefly explain how media attention, and in turn diversity, is by definition constrained and limited.

Day-to-day agenda building by individual journalists and news organizations is first characterized by a systematic drive to process ample, new, and diverse information in a continuous fashion (McQuail, 2010). Yet, a massive incongruity exists between the abundant available information that journalists and media institutions potentially could process and their capacity to actually do so (Boydston, 2013). Because there is too much information available to keep up with – psychological attention is finite, organizational resources are limited, and the carrying capacity of the media agenda is restricted (Boydston, 2013) – information is processed in a boundedly rational fashion (Kahneman, 2003). That is, focus lies on a given set of topics at the time because journalists and news organizations can only keep up with so many stories at once. The necessity to focus attention fosters routinization: journalists and media organizations have relatively stable orientations toward specific actors and issues (Tuchman, 1978), and news is governed by

steady journalistic perceptions about newsworthiness and news values (Harcup and O'Neill, 2001). Furthermore, agenda building functions in the context of stable relations with sources (e.g. specific companies), re-occurring events (e.g. the publication of annual reports), and mimicking behavior of journalists (Vliegenthart and Walgrave, 2008). Also, attention patterns emerge in the context of dominant societal discourses, such as economic and political narratives.

All this shapes the context wherein attention patterns emerge and agenda diversity materializes. Evidently, however, agenda building differs from day to day, resulting in fluctuating attention patterns. Often, attention reflects relatively routinized patterns of agenda building, with attention for a limited variety of objects. Sometimes, however, specific news objects may dominate news, often catapulted on the media agenda by so-called newsworthy trigger events (e.g. crises). This is when agendas get punctuated (Boydston, 2013). Punctuations are frequently occurring periods of disproportional high attention to specific objects that enter the news agenda. From time to time, media pay (often collectively) disproportional amounts of attention to specific topics for a certain period of time (Boydston et al., 2014b). These salience punctuations may vary in terms of impact and duration but are an inherent characteristic of the media agenda.

With regard to this, Boydston et al. (2014b) differentiate between storm and non-storm media coverage. Non-storm coverage can be considered 'normal news reporting': situations that are characterized by a relative fast changing pattern of attention to a relative small set of agenda objects. Media storms, on the other hand, are large and lengthy punctuations, which comprise a considerable share of the media agenda during a specific period (Boydston et al., 2014b). Storm coverage also differs from normal news reporting in the sense that those large and lengthy punctuations should be associated with fewer agenda objects.

High attention to specific agenda objects normally declines after a certain period and the pattern of news reporting shifts back to 'normal reporting', until new punctuations occur. This pattern of continuing trade-offs between salience punctuations and 'normal reporting' produces a diversity pattern that fits the characteristic of 'punctuated equilibrium dynamics' (Boydston, 2013: 54). Journalists try to offer a relative diverse palette of actors, issues, and perspectives, but in practice they end up focusing on a limited set of objects at a time. Since this continuing pattern of generating news is often interrupted by periods of focused attention to specific objects, agenda diversity will vary over time.

Media storms are often caused by trigger events. Such events tend to 'shift the attention of the media, refocusing attention to problems or issues that are either novel or were previously unattended or underattended' (Wolfe et al., 2013: 180). Most of these issues are catapulted into public attention by the media through trigger events (Nisbet and Huges, 2006), but the 'media inevitably exhaust dramatic elements of the issue that are needed to sustain interest' (p. 6). However, some issues or actors remain highly visible on the media agenda and start to receive structurally more attention than other objects (Hilgartner and Bosk, 1988) because they disrupt social order to a large extent (e.g. severe environmental, political, and economic crises qualify; see Boydston, 2013) and are extremely 'loaded' with news value (e.g. dramatic, negative, personal, related to elites).

The erratic day-to-day/week-to-week patterns of low and high attention fluctuations should thus not influence the pattern of long-term media agenda diversity since the complete diversity pattern absorbs the individual salience punctuations (Jennings et al., 2011: 5). However, agenda objects that structurally – or at least for longer periods in time – receive more attention than others could influence long-term agenda diversity negatively (Jennings et al., 2011). The critical question in this regard is to what extent objects have the capacity to dominate the news agenda over longer time periods.

The effect of attention to banks on long-term media agenda diversity

The financial crisis that started in 2007 can be seen as a major trigger event for news attention to the financial system, and banks in particular. Media attributed the crunch of the financial markets to a large extent to commercial banks (Bennett and Kottasz, 2012). Still, critics have also held media accountable for not fulfilling their watchdog role, failing to warn the public about the risks and dangers of commercial banking earlier (Manning, 2013). In effect, the financial crisis turned out to be not only a banking crisis but also a journalistic crisis.

In the recent years, journalists and news organizations have been forced to reorientate their positions vis-a-vis the banking sector and the financial system in general. Ever since the beginning of the financial crisis, commercial banks have been a focal point of attention for journalists around the world (Kleinnijenhuis et al., 2015). This suggests that banks have been ‘prioritized species’ in the mainstream news discourses about companies in this period of financial and economic turmoil. In the Netherlands, this is also reflected in the frequent high waves of media attention around issues like fraud (e.g. the Rabobank Libor scandal in 2013), financial deficits and bankruptcy (e.g. state aid to ING, Fortis and ABN Amro in 2008), bonuses (e.g. ABN Amro in 2014), and the role of banks in Europe and abroad (e.g. relations to banks and the financial deficits of Greece from 2009 onward). During the crisis, the attention for banks is unlikely to have been at the same high level all the time – it is expected to go up and down with the occurrence of new developments and events.

In sum, one can anticipate (a) overall higher levels of attention for the banking sector compared to other sectors during an economic crisis and (b) more fluctuation in attention compared to other sectors. In the context of the above, this means that we expect that news about banks will punctuate the news discourse, on average, more often than news about other firm types. We argue that banks will be structurally prioritized when compared to other company types and are thus able to ‘push’ other companies from the agenda.

Structural prioritization means a systematic negative effect on the diversity of the whole agenda. Hence, the following hypothesis is proposed:

H1. Increased attention to banks leads to a structural decline in agenda diversity in Dutch news between 2007 and 2013.

Method

Data and case

Our dataset consists of all company news articles about highly visible company types, published in the economy section of *NRC Handelsblad*, between 1 January 2007 and 31 December 2013.

In the study's time period, the Dutch economy was first affected by the US mortgage crisis (beginning 2007). Lending money became more expensive; banks became increasingly precautionary with mortgage lending; the Dutch stock exchange (AEX) dropped; and consumer confidence and trust in the economy and banks declined. In September 2008, the US credit and banking crisis led to a banking crisis in the Netherlands. Hereafter, the crisis evolved into the Euro and a broader economic crisis, which can overall be characterized by a decreasing gross domestic product (since 2008), declining purchasing power (from 2010 to 2013), and declining employment (since 2007) followed by a gradual increase (since late 2009).

Although the newspaper market suffered from a severe decline in circulation rates since the start of the economic crisis in 2007, quality newspapers are still regarded as a major information source in the Netherlands (Bakker and Scholten, 2014). The Netherlands is a prototypical example of the 'democratic corporatist model' (Hallin and Mancini, 2004), with independent media, high level of professionalization of journalism, as well as traditionally high circulation numbers of newspapers.

NRC Handelsblad is one of the largest daily quality newspapers in the Netherlands (the other large newspapers are *Telegraaf*, *Trouw*, *Algemeen Dagblad*, and *de Volkskrant*). *NRC* stands out for its broad and extensive coverage on economic issues (Bakker and Scholten, 2014), which makes it particularly suitable for examining news related to the economy (Hollanders and Vliegenthart, 2011). A practical advantage regarding our choice to study *NRC* coverage is that its digital database, in contrast to the other outlets, covers clear sections. This allowed us to automatically separate economic news from other news.

We started with retrieving all articles that were published in *NRC Handelsblad* in the period of study from the *LexisNexis* database (N=243,171) and subsequently narrowed down the sample to meet our requirements. First, we identified all articles that were published in the Economy section of the paper (N=29,843) because news about corporations can be conceptualized as a sub-category of economic news (Kalogeropoulos et al., 2015).

Further inspection of the data showed that not all entries contained full articles (as in written texts) but occasionally were lists or tables (e.g. stock exchange ratings). By plotting a histogram of the number-to-word ratios of the articles, we determined that entries in which 16 percent of the characters are numbers instead of words are extremely likely to belong to the category of non-articles. We removed them, which narrowed down the dataset to 29,595 articles.

Preprocessing and determination of relevant companies

All preprocessing and large parts of the analysis were done using a program that we named INCA (Infrastructure for Automated Content Analysis). The program involves a

set of Python scripts that we previously developed in another context (see Trilling and Jonkman, 2015) and that will be made available to any interested researcher. INCA contains a parser that separates individual articles from metadata like publication date, section, author, and the like, and subsequently stores the parsed data in a MongoDB database.¹ This database was then used for preprocessing and cleaning the data, which was also done within our program.

Next to steps like conversion to lowercase and the removal of stop words and punctuation, we paid extensive attention to the recoding of potential firms mentioned in our data in order to circumvent underestimation of news attention to firms. We manually compiled a list of companies – based on existing lists of Dutch and Non-Dutch multinationals, and AEX stock market-listed firms potentially relevant for our study. If a firm on this list contained more than one word or had synonyms or different spellings, our program used *regular expressions* to replace these by a unique term that we defined. For example, Air France KLM and different variations on it were all converted into Air_France_KLM and ABN AMRO into ABN_AMRO. In addition, we supplemented abbreviations like ABN by the full (new) name, if the full name was mentioned in the same text.

Determination of most prominent companies

In a next phase, we compiled a list of the 100 companies with the highest media visibility. Instead of using pre-existing lists or rankings with company names (e.g. the Fortune 500 ranking for most reputable firms), which is common practice in research involving news about corporations, we propose to inductively define which companies to select. This approach suits our type of research better since news media have their own selection mechanisms for relevant information (Shoemaker and Reese, 1996). In other words, being able to inductively retrieve the most visible firms in the news gives us an idea of the *media prominence* of corporations. To this end, we calculated the frequency of each word in the whole dataset, with the exception of words (including their conjugations) that appear in a Dutch dictionary. For validity reasons, we compared our pre-existing list of companies to the dictionary list to avoid missing firm names that may appear in the dictionary. Two names (TomTom and Amstel)² were found and they were removed from the dictionary. This dictionary filter function gave us a list with several thousand words (predominantly referring to specific social actors and issues; i.e. non-Dutch words). Subsequently, we selected the first 100 companies on that list manually. We also considered using named entity recognition for this task, but decided to use the dictionary filter approach instead to minimize the chance of missing a company.³

As we are interested in news about companies, we included only articles in which at least one of the 100 most media prominent companies was mentioned in our further analysis. This narrowed the final dataset down to 14,363 articles.

Independent variables: Attention to company types

We allocated each of the identified firms to an overarching *company type*, using the Global Industry Classification Standards (GICS) industry classification scheme, which is a classification scheme for company types commonly used in economic and financial research

and practice (see: Hrazdil et al., 2013).⁴ We based the allocation process on information from the Orbis and Osiris databases. Both databases are commonly used sources in economic and strategy research involving corporations. The databases contain all sorts of data about public and private companies worldwide, including information about the GICS classification of firms. All the Top 100 companies that we detected in our data were also present in the Orbis and Osiris databases. In accordance with the way the Orbis and Osiris organize their data, we defined our company types on the GICS ‘industry groups’ level. According to the GICS scheme, there are 24 company types in total in this overarching category. On the basis of the information provided by Orbis and Osiris, we were able to allocate the 100 media prominent companies to 17 (of the 24) distinct company type categories: (1) Utilities; (2) Transportation; (3) Telecommunication Service; (4) Technology Hardware and Equipment; (5) Software and Services; (6) Semiconductors and Semiconductor Equipment; (7) Real Estate; (8) Media; (9) Materials; (10) Insurance; (11) Food and Staples Retailing; (12) Energy; (13) Diversified Financials; (14) Consumer Durables and Apparel; (15) Capital Goods; (16) Banks; (17) Automobiles and Components. Those 17 company types could thus be considered ‘media prominent company types’.⁵

We used the aggregated number of mentions in a week of all company types as independent variables in our analysis. We chose a weekly level of analyses because weeks refer to the weekly cycle of news presentation (Boydston et al., 2014a).⁶ This means that it is likely that those periods of normal news reporting and/or salience punctuations begin and end at the beginning of news weeks. The analytic lens of a daily level can be best used to investigate the dynamics of high fluctuations reporting, whereas a monthly level of analysis is more suited for long-term events.

Dependent variable: Media agenda diversity

To measure media agenda diversity, we use Shannon’s H entropy (Shannon and Weaver, 1949), which is the most used measure in agenda diversity research (Jennings et al., 2011; John and Jennings, 2010; Jones and Baumgartner, 2005). Shannon’s H is based on the distribution of observations across a given number of distinct object categories, weighted by the occurrence of these object categories (Kleinnijenhuis et al., 2015). Mathematically, the formula is represented in the following form

$$H = - \sum_{i=1}^n p(x_i) \ln(p(x_i)) \quad (1)$$

In our case, entropy (H) is the negative sum for all firm types of the likelihood $p(x)$ that a firm type x is allocated to a specific industry segment i , multiplied by the natural logarithm of that likelihood (Jennings et al., 2011). As $\ln(0)$ is undefined, we replaced the zero with a very small proportion: 0.0000001. This is common procedure in agenda-setting research (Boydston et al., 2014a). While the minimum score of Shannon’s H is always equal to zero (complete focus of attention on one category), the maximum score is dependent on the amount of categories. Our study is based on 17 distinct categories, which implies that the maximum value for Shannon’s H is $\ln(17) \approx 2.833$.

Control variables

We used the following variables as control variables in the analysis.

Volume. It is conceivable that a higher volume of coverage might give room to more diverse coverage. We therefore control for the amount of (1) words used in company news per week and (2) the amount of articles in news about corporations per week.

Crisis dummy. We have argued that commercial banks have been media salient, especially in the beginning of the economic crisis, during the credit crisis. We therefore control for this specific period. The exogenous variable ‘credit crisis’ is operationalized as the period between the first week of July 2007 and the first week of November 2009 and captured by a dummy variable (0=no crisis, 1=crisis). According to Kleinnijenhuis et al. (2015), this period was a phase in which several banks received a lot of media attention. This phase started with a mortgage crisis in the United States. On 15 September 2008, Lehman Brothers (a US investment bank) crashed, causing a shock in the financial system. Suddenly, they were even more in the spotlight than before. In 2008 and 2009, a series of severe crises happened, involving several foreign as well as Dutch firms, especially banks (e.g. Fortis, ABN Amro, ING, Ice save (an Icelandic bank), and the DSB bank). This phase ends in the last week of October 2009, when the problems around the deficits in Greece were announced (Kleinnijenhuis et al., 2015). We argued before that media attention to banks ‘exploded’ during the credit crisis. It is therefore relevant to control for this period.

Time-series analysis: Partly adjusted Autoregressive Distributed Lag model

To analyze the data, we used time-series analysis and built a partly adjusted Autoregressive Distributed Lag (ADL) model. Since our data have the form of time series, with weekly observations, we have to take into consideration the specific characteristics of time dependent data. First, however, it is necessary to determine whether the time series are stationary (Vliegthart, 2014) – that is, the mean is not dependent on the time of observation. To this end, we used a Dickey Fuller Unit Root Test – to test null hypothesis that the series are non-stationary. This test revealed that this null hypothesis can be rejected and the series are indeed stationary ($Z=-13.48$, $p<0.001$). Consequently, the series do not have to be differenced.

Autoregression and time

A second issue with time series is the overtime dependency. In our model, we include a lagged dependent variable (or AR(1) component) to account for this dependency. Autoregression (AR) refers to the extent to which the value of a variable is explained by its own past value ($t-1$). In our case, this means the influence of the agenda diversity of the previous week on the current week. We additionally also control for linearity in over time, by adding a trend variable that takes the value of 0 for the first observation and increases with one each week. Ljung-Box Q tests suggest that with the inclusion of the

Table 1. Descriptive statistics of all the continuous variables.

Variable	N	Mean	SD	Min	Max
Entropy	365	2.09	0.25	0.81	2.52
Amount of articles	365	81.08	15.42	33.00	138.00
Total length of articles in words	365	24,347.07	5248.96	10,755.00	51,955.00
Utilities	365	8.88	14.01	0.00	135
Transportation	365	29.60	23.66	0.00	129.00
Telecommunication Service	365	10.92	14.25	0.00	91.00
Technology Hardware & Equipment	365	16.13	17.39	0.00	128.00
Software and Services	365	21.69	20.53	0.00	124.00
Real Estate	365	2.86	10.10	0.00	102.00
Media	365	5.60	10.26	0.00	118.00
Materials	365	11.00	17.14	0.00	232.00
Insurance	365	9.33	10.74	0.00	78.00
Food and Staples Retailing	365	17.26	14.68	0.00	97.00
Energy	365	12.95	15.78	0.00	146.00
Diversified Financials	365	11.14	12.88	0.00	103.00
Consumer Durables and Apparel	365	4.39	6.45	0.00	43.00
Capital Goods	365	24.40	21.23	0.00	140.00
Banks	365	84.29	62.75	3.00	530.00
Automobiles and Components	365	27.50	31.13	0.00	287.00
Semiconductors and Semiconductor Equipment	365	4.31	7.71	0.00	52.00

SD: standard deviation.

lagged dependent variable and the trend variable, the residuals do not contain any additional autocorrelation and thus the temporal dependencies in the data are well accounted for. Furthermore, for the final model, the ADL model with one lag results in residuals that are white noise (Ljung-Box Q-test for 20 lags = 11.90, $p=0.92$).

In our analysis, we test the immediate effect of the attention for various company types on agenda diversity. With the inclusion of a lagged dependent variable and a time trend, this means that our model formally resembles a partial adjusted ADL model (De Boef and Keele, 2008). We present our partly adjusted ADL model of media agenda diversity in company news in three hierarchical steps: (1) the effects of the AR, trend, and agenda volume (amount of words and amount of articles per week) have been tested; (2) then, we included the exogenous dummy variable for the crisis; and (3) we included the variables for the attention for the different company types.

Results

First, looking at the descriptive statistics (see Table 1), we see that attention to *Banks* is on average much higher than attention for other company types, while also its standard deviation (SD) is high ($M=84.29$, $SD=62.75$). Additionally, the maximum amount of mentions are higher for *Banks*, and they are the only company type with a minimum of

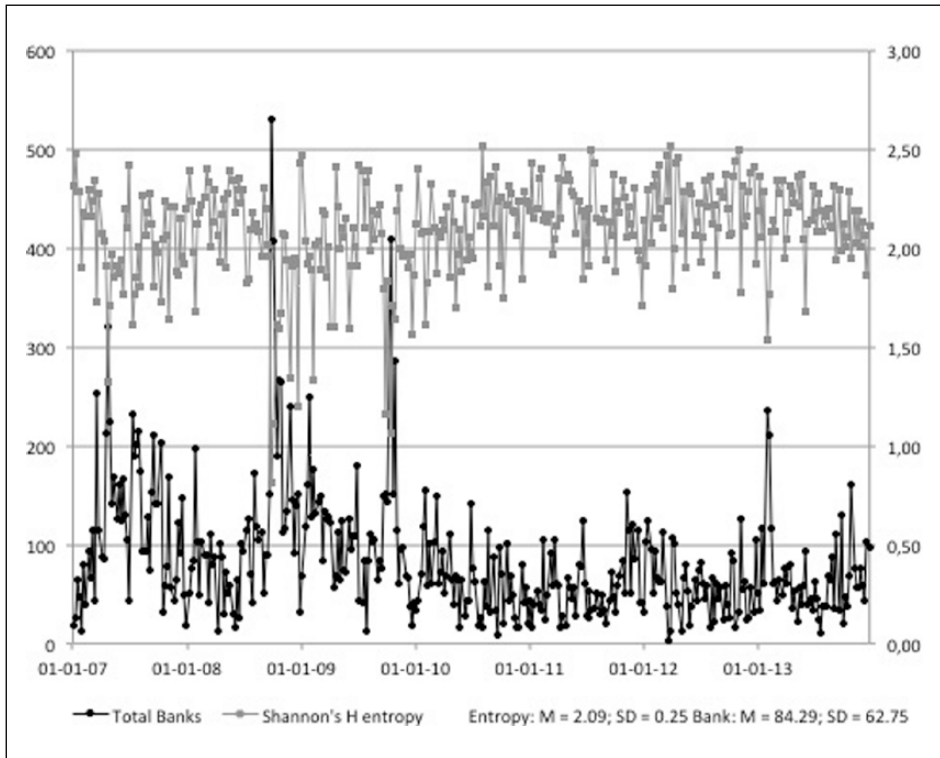


Figure 1. Visual representations of the relationships between overtime attention to banks and long-term entropy on a weekly level.

three mentions per week, while the rest of the company types all have minimum scores of 0. The level of entropy is on average relatively high since the level of entropy in this study can theoretically fluctuate between 0 and 2.83 and has an empirically observed range of 0.81–2.52.

Figure 1 shows the relations between overtime attention to banks and entropy, as measure for agenda diversity. As expected, the graphs show attention patterns that are characterized by relatively long periods of focused attention, with low entropy levels. These salience punctuations appear to be the heaviest during the financial crisis. Figure 1 shows that entropy decreases during periods of frequent salience punctuations (periods of focused attention) – especially during the financial crisis.

Explaining media agenda diversity

In order to explain media agenda diversity, we tested three models. The results are shown in Table 2.

Model 0 consists of the control variables only. When adding the credit crisis dummy to the model (Model 1), the explained variance slightly increases ($\Delta R^2=0.01$).

Table 2. Partly adjusted ADL model for agenda diversity in company news.

Variables	Model 0	Model 1	Model 2
AR	0.288***	0.272***	0.038
Trend	0.000***	0.000	0.000
Amount of articles	0.002*	0.002*	0.000
Total length of articles in words	0.000	0.000	0.000***
Financial crisis (dummy)		-0.080*	0.001
Utilities			0.002***
Transportation			-0.001
Telecommunication Service			0.003***
Technology Hardware and Equipment			0.001**
Software and Services			0.000
Real Estate			0.001
Media			0.003***
Materials			0.001
Insurance			0.002**
Food and Staples Retailing			0.001*
Energy			0.000
Diversified Financials			0.000
Consumer Durables and Apparel			0.004**
Capital Goods			0.000
Banks			-0.003***
Automobiles and Components			-0.001***
Semiconductors and Semiconductor Equipment			0.004***
Constant	1.320***	1.402***	1.960***
N	364	364	364
R ²	0.15	0.16	0.71
Log likelihood	23.38	26.19	21.92
Bayes info criterion	-17.28	-16.99	-30.27

ADL: Autoregressive Distributed Lag; AR: autoregression.

* $p < 0.05$; ** $p < 0.01$; and *** $p < 0.00$.

As was observable in Figure 1, results indicate that during the credit crisis (July 2007 to November 2009), diversity was lower (0.080, $p < 0.05$).

However, Model 2, with the attention to all the company types added, reveals that it is not the credit crisis as such that drives long-term agenda diversity but rather the company types mentioned in the news during the crisis.

In fact, we observe a substantial increase in explained variation in agenda diversity ($\Delta R^2 = 0.55$) when taking the visibility of company types into account as well. This is in line with the bivariate statistics presented in Table 3 (see Appendix 1).

The bivariate analysis shows that the credit crisis (dummy) correlates highly with *Banks*, *Utilities*, and *Automobiles and Components*. That explains why the credit crisis variable becomes insignificant in Model 2.

Model 2 specifies that banks – as expected – have a significant negative impact on agenda diversity (-0.003 , $p < 0.001$). This means that if banks are in the news media, agenda diversity declines. Banks having a negative impact on agenda diversity of -0.003 indicates that, for example, in a week where 50 percent of attention is attributed to banks, agenda diversity declines with 0.0015. The effect is small yet substantial, given the theoretical and empirically observed range of entropy that we observed above.

Notably, *Automobiles and Components* also shows a significant negative impact on diversity. Yet, the effect of this firm type is smaller when compared to the impact of *Banks* (-0.001 , $p < 0.001$). An explanation for this effect might be that also the automobile industry has been hit seriously by the crisis and shows considerable variation in attention during the research period (see also Table 1).

Looking at the other firm types, we can observe another pattern. Most of the other firm types (8 out of 15) have a significant positive effect on media agenda diversity (*Utilities, Telecommunication Service, Technology Hardware and Equipment, Media, Insurance, Food and Staples Retailing, Consumer Durables and Apparel, and Semiconductors and Semiconductor Equipment*). The positive effects suggest that these sorts of firms are associated with more space on the media agenda. For example, if 5 percent of the attention is devoted to *Semiconductors and Semiconductor Equipment* (the type with the strongest effect: 0.004 , $p < 0.001$), agenda diversity increases by 0.0002.

Based on these results, our hypothesis that increased attention to banks leads to a structural decline in media diversity in the Dutch news between 2007 and 2013 can therefore be confirmed.

Conclusion and discussion

The results of our study suggest that banks, and to a lesser extent also the ‘automobiles and components’ industry, have been structurally prioritized above other media prominent company types in *NRC* company news coverage between 2007 and 2013. Most other firm types have been associated with more agenda diversity instead of less, indicating that these corporate actors receive on average more attention only when there is a wider set of corporate actors on the agenda. Notably, the effect sizes related to these differences are small, while the average mean of agenda diversity is high. This suggests that a fairly diverse company news agenda has been built and maintained during the economic crisis. Our findings point to the structural prioritization of banks, but the prioritization is fairly limited in its scope.

Despite the small size of this effect, our results are in line with the theoretical idea that structural prioritization of corporate actors in the news through accumulated agenda punctuations and media storms influences the structure of the whole media agenda in a systematic way (Boydston, 2013). In our theoretical reasoning, we argued that the space for agenda building is inherently restricted because it reflects a ‘zero-sum game’ (Zhu, 1992). This means that the diversity structure of media agendas can be negatively influenced by attention to corporate actors if these actors receive on average more attention than other actors. Broadly speaking, our results support this idea. Attention to banks is on average and over time higher than all other corporate actors that are present in the news. Furthermore, we also observed that the salience punctuations that can be attributed to

banks are on average more frequent and larger than those punctuations belonging to other kind of corporate actors. In other words, we observed more and heavier storm coverage regarding banks in comparison with other company types. This indicates that banks might be newsworthy across the board, but at some periods a lot more than in other periods – and thus that news might be ‘event-driven’ to a certain extent.

Some reflections are important in the context of these findings. The effects that we found are small in absolute terms. Yet, since the proportion of explained variance increased substantially when accounting for the firm type variables, this suggests that the overall variation in the distribution of attention to company types is small. In other words, we are able to explain a considerable proportion of the variance in agenda diversity over time by looking at attention to the different types of companies, despite the small effect sizes. Two processes, which are in line with our theoretical reasoning, may explain this. First, routinized agenda building may indeed result in a very stable pattern of attention distribution across companies and company types: that is, journalists generate information about a relatively fixed set of corporate actors, which receive relatively stable amounts of attention over time (Harcup and O’Neill, 2001). Second, it could be that journalists indeed actively try to offer a diverse news agenda in weekly news cycles, despite frequent agenda punctuations (Boydston, 2013). This is also reflected by the high mean in media agenda diversity that we found over time. In other words, the results reflect the idea that journalists are systematically caught in an ‘equilibrium’: they seem to be moving around a relatively small set of actors and issues for a certain period of time while seeking to maintain a diverse media agenda at the same time (Boydston, 2013: 54). As was brought up earlier, journalists were criticized for not fulfilling their watchdog role properly, before and during the economic crisis. In response to such critique, it might well be considered socially legitimate, or even desirable, that journalists pay intensified attention to particular issues, events, and actors over longer time periods, as long as they strive to maintain a diverse agenda in general. Our findings seem to echo that idea. An additional explanation for the small effect sizes could be related to the size of the agenda. The economic section of the newspaper is a relatively large agenda compared to, for example, the first page of a newspaper, a television news bulletin, or the first page of a website. The larger the news agenda, the more possibilities there are to construct a diverse agenda. Future research should take different kind of news agendas and interrelated dynamics of agendas into account (e.g. front-page news vs the rest of a newspaper, or front-pages of websites vs whole websites).

Of course, our study has some limitations that need to be addressed. Although we analyzed a newspaper that is known for its broad range of topics related to firms and the economy, it is still only *one* news outlet. Given that we used a method to assess agenda diversity that has not been used before in this context, we do not want to claim that our study provides a comprehensive answer to the question how agenda diversity in economic news can be explained. Instead, we rather see our case study as a point of departure for future research. In particular, our findings have to be re-tested across a broader variety of news outlets (e.g. diverse newspapers, online news, television news) because the characteristics of news outlets might play an important role in the way attention to news is distributed. Similarly, cross-national comparisons may reveal structural

differences between countries with, for example, different media systems. In addition, we focused explicitly on large and highly media salient firms in a specific time period (the economic crisis), neglecting, for instance, the bulk of medium-sized businesses in their daily business. Future research could look at longer time periods to investigate long-term general trends and the importance of key events. The contribution of our study, therefore, goes beyond the – admittedly limited – case we have studied: We hope that the framework for assessing agenda diversity, which we introduced, can serve as a useful inspiration for such larger studies.

Next to broadening the scope of such studies by introducing comparative or long-term elements, future research on agenda diversity in company news content could consider not only organizational actors but also issues. It would, for example, be interesting to explore the variation of issues in news about organizations and examine to what extent these issues are prioritized in comparison with one another. In particular, issue–actor relations could be taken into account (see Kleinnijenhuis et al., 2015). Because agenda diversity could be seen as a particular instance of the broader concept of ‘attention diversity’ (Boydston et al., 2014a), such ideas could also be translated to other realms of media content research. This type of broader conceptualization allows researchers to also incorporate other, more substantial, content characteristics in diversity research (e.g. frames, perspectives, and discourses).

Finally, our study particularly seeks to inform agenda-building and agenda-setting research. In addition to our approach, scholars could use Shoemaker and Reese’s (1996) ‘theory of a hierarchy of influences on media content’, to examine how variables on micro, mezzo, and macro levels influence agenda diversity. Furthermore, in addition to the existing body of knowledge on the interaction between agenda diversity and agenda setting, future research should examine how media agenda diversity moderates the two-step process of agenda building and agenda setting. For example, the news-mediated influence of public relations efforts (e.g. attempts to influence the public through the media) could be moderated by long-term agenda diversity. It is up to future research to enhance the design we used and explore such possible effects.

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Notes

1. MongoDB is a so-called NoSQL database, which is a type of database that is very suitable for storing large amounts of semi-structured data. This allows us to use advanced filtering methods in a very efficient way.
2. Both are Dutch firms.
3. Named entity recognition is a technique to detect names of persons, organizations, and so on. One approach is to use an algorithm that parses the syntactical structure of a sentence and distinguishes proper nouns from other nouns.
4. See <https://www.msci.com/gics> for more info.

5. We encountered 17 of the 24 Global Industry Classification Standards (GICS) categories in our data. The other seven categories were simply not present in the data. See <http://www.bvdinfo.com/en-gb/home> for all substantial info about the categories in the GICS scheme.
6. *NRC Handelsblad* publishes editions from Monday until Saturday.

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Appendix I

Table 3. Bivariate correlations.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Entropy	1																					
2. Amount of articles	-0.01	1																				
3. Total length of articles	-0.04	0.46	1																			
4. Financial crisis (dummy)	-0.25	0.34	0.02	1																		
5. Utilities	0.07	0.25	0.14	0.27	1																	
6. Transportation	0.09	0.21	0.26	-0.04	0.12	1																
7. Telecommunication Service	0.25	0.04	0.05	-0.20	-0.08	0.04	1															
8. Technology Hardware and Equipment	0.26	-0.08	0.15	-0.29	-0.06	0.00	0.11	1														
9. Software and Services	0.21	0.10	0.18	-0.13	-0.03	0.04	0.21	0.20	1													
10. Real Estate	0.16	-0.13	0.06	-0.20	-0.13	0.00	0.25	0.16	0.11	1												
11. Media	0.15	0.18	0.23	0.00	0.18	0.10	-0.02	-0.06	0.00	-0.03	1											
12. Materials	0.06	0.11	0.07	0.01	0.15	0.05	0.01	-0.06	0.04	-0.03	0.03	1										
13. Insurance	-0.03	0.14	0.22	0.16	0.06	0.09	-0.10	-0.10	-0.14	0.01	0.08	-0.01	1									
14. Food and Staples Retailing	0.15	0.09	0.15	-0.10	-0.05	0.02	0.05	0.05	0.05	0.03	-0.06	0.01	-0.07	1								
15. Energy	0.08	0.09	0.09	-0.10	0.01	-0.13	-0.07	-0.05	0.00	-0.03	0.00	0.08	-0.03	0.05	1							
16. Diversified Financials	-0.07	0.04	0.24	0.15	-0.04	0.01	-0.04	0.07	-0.03	-0.07	-0.01	-0.06	0.14	-0.03	-0.08	1						
17. Consumer Durables and Apparel	0.09	0.16	0.13	0.16	0.02	0.00	-0.01	0.15	0.09	0.13	0.03	-0.02	-0.04	0.05	0.00	-0.06	1					
18. Capital Goods	0.14	0.32	0.26	0.10	0.06	0.10	-0.06	-0.03	0.04	-0.09	0.10	0.11	0.03	0.08	0.06	-0.04	0.10	1				
19. Banks	-0.71	0.26	0.37	0.38	0.10	-0.06	-0.13	-0.17	-0.15	-0.12	0.05	0.04	0.20	-0.07	-0.11	0.15	0.09	0.02	1			
20. Automobiles and Components	-0.16	0.16	0.23	0.16	0.14	-0.02	-0.09	-0.06	-0.08	-0.11	0.08	-0.04	0.04	-0.10	0.17	0.04	-0.01	-0.13	0.07	1		
21. Semiconductors and Semiconductor Equipment	0.17	0.08	-0.03	0.19	0.10	-0.05	-0.10	0.01	0.01	-0.10	0.00	0.01	0.07	-0.08	0.04	0.05	0.02	0.12	-0.04	0.03	1	