Fiscal Policy in the Bundestag and the Media[*]

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Abstract

Mass media play a crucial role in a society. Media narratives have been used to describe, explain and forecast (macro)economic variables. However, little is known about how the media accompany fiscal policy debates in the German Bundestag. We address this question by constructing a fiscal policy sentiment index based on one of the leading newspapers in Germany, *Frankfurter Allgemeine Zeitung*. We apply NLP to obtain fiscal policy related sentiment scores for FAZ articles and Bundestag speeches. We find that the two indices significantly correlate with each other, especially during recession periods. Further, we find that the sentiment indices are Granger causal to each other supporting interconnectedness between political debates and media reporting.

Key Words: fiscal policy, news, parliament, natural language processing
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1 Introduction

The media report about fiscal policy. In turn, policymakers respond to media sentiment. In this paper, we shed light on this interaction between fiscal debates in the Bundestag and media reporting. In Germany, the German Bundestag takes a central role in the country's policy-making process. A recent study by Latifi et al. (2024) constructs a fiscal policy sentiment index based on the speeches given in the German Bundestag. We aim to analyze the sentiment of fiscal policy related news that accompany the parliamentary debates. To the best of our knowledge, we are the first to construct a news-based fiscal sentiment index for Germany. We assume that most people do not read the stenographic reports of the German Bundestag, nor do they watch the live broadcasts of its meetings on a regular basis. These reports and debates are often long and complex, making them inaccessible to many. This is where the media play a crucial role as a bridge between policymakers and the public. Additionally, the media also picks up sentiment of households and firms and delivers this information to policy.

News-based text indicators play an increasing role in (macro)economic context. Recently, media narratives have been used to forecast German industrial production (Ulbricht et al., 2017) and inflation (Beckers et al., 2017; Müller et al., 2022). Fantozzi and Muscarnera (2021) construct a news-based fiscal policy indicator using an Italian business newspaper and show delayed effects of the shock in news-based fiscal sentiment on government spending, consumption and investment. Mohl et al. (2021) examine the impact of media coverage on the effectiveness of EU fiscal rules. They find that reporting is more frequent in countries with well-developed fiscal institutions and in bad economic times. The authors conclude that media visibility contributes positively to effective fiscal rules.

Building on this strand of literature, we construct a news-based fiscal policy sentiment for Germany. We use a large dataset of economic news articles from the *Frankfurter Allgemeine Zeitung* (FAZ) over the period from 1960 to 2021. Section 2 briefly describes the Bundestag fiscal sentiment series provided by Latifi et al. (2024) as well as presents their approach. In Sec-

tion 3, we introduce the dataset on FAZ articles. In Section 4, we analyze the interaction between the two indices and discuss possible reasons for the discrepancies between them. Additional Granger causality test are presented in Section 5. Section 6 summarizes the findings and provides research outlook.

2   Fiscal policy in the Bundestag

More recently, parliamentary speeches have been used by researchers to gain valuable insights into the policy-making process. Latifi et al. (2024) develop a fiscal policy sentiment index for the German Bundestag solely based on parliamentary speeches. They build on a neural network-based text representation technique that enables transforming natural language into high-dimensional vectors. They use the so-called word embeddings to measure the sentiment of the debates on fiscal policy.[1]

The movements of the resulted fiscal sentiment index not only align with historical economic, political, and social events, Latifi et al. (2024) further show that their index indeed has real economic effects, namely on government spending, output and consumption.

3   Fiscal policy in the public discourse

The "Frankfurter Allgemeine Zeitung" (FAZ) is a quality newspaper and one of the leading media in Germany (Landmeier and Daschmann, 2011). Its reporting is both intermediary and extramediary relevant. Thus, the FAZ fulfils an overarching social function by influencing the reporting of other media that are oriented towards the FAZ and by having a direct impact on society by accompanying the public discourse on socially relevant issues (Jandura and Brosius, 2011). For these reasons, we use the FAZ reporting as the basis

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[1]In a nutshell, Word2Vec is an unsupervised neural networks based method to represent natural language in a high-dimensional vector space (Mikolov, Chen, Corrado and Dean, 2013; Mikolov, Sutskever, Chen, Corrado and Dean, 2013; Le and Mikolov, 2014). The resulting text vectors (or embeddings) proved to be state-of-the-art in capturing the semantic characteristics of the words or texts. These embeddings are characterized by the additive property and the interpretability of the distances between them.

for our automated text analysis. First, we construct a text corpus consisting of all news articles related to fiscal policy and the economy published in the FAZ from January 1960 to September 2021, which we obtained from the digitized FAZ archive. This dataset aims to reflect the public debate on fiscal policy. To collect the relevant data, we used a set of keywords listed in Appendix A. The final corpus consists of a total of 229, 845 news articles. In Table 1, the number of articles assigned to each respective ressort, as labeled by FAZ, is presented. It is not surprising that the ressorts "Economy" and "Politics" are the most frequently represented.

Ressort	Count
Wirtschaft (Economy)	159,142
Politik (Politics)	57,769
Verlagsbeilage (Publisher's Supplement)	2,485
Natur und Wissenschaft (Nature and Science)	1,922
Reiseblatt (Travel Section)	1,842
Immobilienmarkt (Real Estate Market)	1,564
Bilder und Zeiten (Pictures and Times)	1,361
Beruf und Chance (Career and Opportunities)	817
Kunstmarkt (Art Market)	734
Berliner Seiten (Berlin Pages)	627
Redaktionsbeilage (Editorial Supplement)	608
Neue Sachbücher (New Non-fiction Books)	264
Motormarkt (Motor Market)	251
Literaturbeilage (Literature Supplement)	243
Dokumente der Zeit (Documents of the Time)	147
Schallplatten und Phono (Records and Phonograph)	52
Buchmessezeitung (Book Fair Newspaper)	10
Sonderdruck (Special Print)	5
Extrablatt (Extra Sheet)	1
Anzeigensonderveröffentlichung (Special Advertising Publication)	1

Table 1: Number of Articles by Ressort

Analogous to Latifi et al. (2024), we apply standard preprocessing steps to the FAZ corpus (for more details see Appendix B). Figure 1 presents the number of fiscal policy articles aggregated at quarterly frequency for the period 1960 - 2021. The number of news articles on fiscal policy and the

economy shows a clear increase from an average of 400 articles per quarter in 1960 to almost 1800 articles per quarter in 1999, followed by a downward trend, with the average volume in 2021 being around 700 articles per quarter.

Figure 1: Economy related news in FAZ
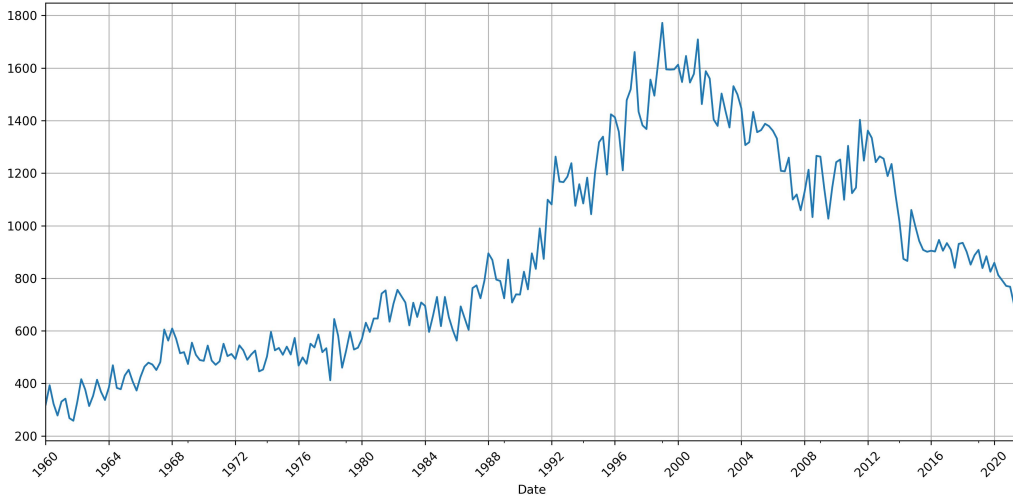
Notes: The figure shows the number of news articles related to fiscal policy and economy over our sample period aggregated to quarterly frequency.

Once the underlying data set has been prepared for further NLP applications, a fiscal policy sentiment time series can be constructed on the basis of a dynamic Doc2Vec approach, analogous to Latifi et al. (2024) for the Bundestag corpus.

The adapted approach consists of three steps. First, to obtain vector representations for FAZ articles, we rely on the Doc2Vec models trained using the Bundestag speeches. We infer vectors based on these models for each article in the FAZ corpus. This has the advantage that the vectors are represented in the shared space and can be directly compared. Second, for each article beginning from 1970, we calculate cosine similarities between the inferred articles' vectors and the fiscal policy vectors. Thereby, we again rely on the pre-trained models and the constructed expansionary and contractionary vectors based on the Bundestag data. Finally, we construct a continuous fiscal policy indicator by calculating the difference between the cosine similarity to the expansionary vector and the contractionary vector.

This indicator ranges from -1 (highly contractionary) to 1 (highly expansionary).

4 Discrepancies between parliamentary debates and public reporting

In this section, we present and analyze the two indices that capture the dynamics of fiscal policy sentiment in Germany. Although the construction procedure of these two indices is identical, the underlying text data are different. The first one is based on the speeches delivered in the Bundestag, the German parliament. The second one is based on the news articles from the *Frankfurter Allgemeine Zeitung*. Figure 2 shows the two standardized indices as well as the recession periods as identified by the German Council of Economic Experts (gray-shaded areas).

Figure 2: FAZ and Bundestag Sentiment
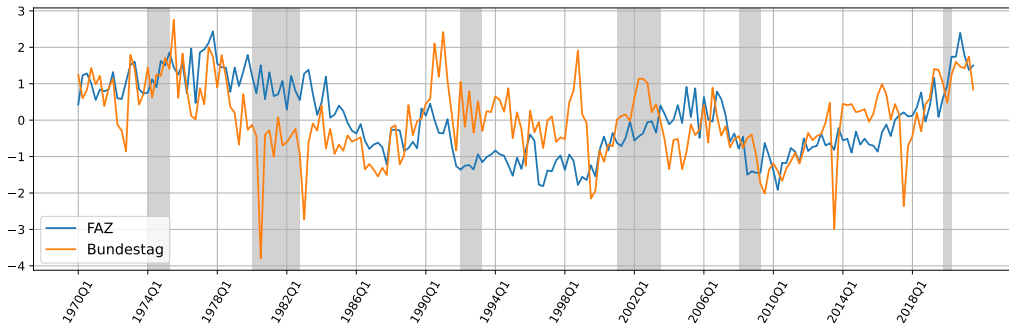
Notes: The figure shows the standardized fiscal sentiment indices for the German Bundestag as well as for FAZ in the period from 1970Q1 to 2021Q3. The shaded areas highlight recessions identified by the German Council of Economic Experts.

The overall Pearson's correlation coefficient between the two series is 0.39 (p-value = 0.00). The two sentiment series are thus positively and significantly correlated. A closer look at the series reveals shared trends. In particular, both indices display peaks during major fiscal debates, such as reunification in the early 1990s and the global financial crisis of 2008, highlighting

attention to fiscal policy measures in both the newspaper and parliamentary discussions.

In order to gain a more detailed insight into the legislative periods, in which the fiscal sentiment of public reporting and the German Bundestag are closely aligned, we calculate correlation coefficients for individual legislative periods in the dataset. These are summarized in Table 2. Bold values indicate significant correlation at 5%-level.

Table 2 shows that in 10 out of 14 legislative periods, there is no statistically significant correlation between Bundestag sentiment and FAZ sentiment. In the other four periods, the legislative periods 11, 12, 16, and 19, the correlation coefficient is positive and highly significant. This suggests that the FAZ's reporting reflects the debates and fiscal stance in the German Bundestag. Further, it is striking that important events with fiscal policy challenges occurred in these legislative periods: for example, the Berlin Wall fell on November 9, 1989 during legislative period 11, while legislative period 12 marked a decisive event in German history, as the first all-German Bundestag was elected. In addition, various economic policy measures were necessary to align the economic and social standard of living in East Germany with West Germany. In this context, for example, the Solidarity Surcharge ("Solidaritätszuschlag") was introduced in 1991. During legislative period 16, the global financial crisis of 2008/2009 led to an economic recession. Important fiscal policy measures were adopted during this challenging period. The Treaty of Lisbon came into force in 2009 and committed the EU member states to budgetary discipline. In response to the financial crisis, the Bundestag amended the constitution and decided to include the "Schuldenbremse", a regulation to limit government debt, in the Grundgesetz (Basic Law for the Federal Republic of Germany) in 2009. In legislative period 19, the focus was dominated by the COVID-19 pandemic, which required extensive fiscal policy measures. For instance, the value-added tax was temporarily reduced, short-time working allowance was introduced, and immediate aid programs for small and medium-sized enterprises were provided.

Additionally, we observe that three of the four legislative periods, namely 12, 16 and 19, with highly significant correlation between Bundestag and

FAZ sentiment, belong to recession periods. This suggests that FAZ reporting, particularly during uncertain times, reflects the fiscal sentiment in the Bundestag without alteration and conveys it to the broader public. However, it cannot be concluded that FAZ sentiment always exhibits a significantly positive correlation with Bundestag sentiment during recession periods. For instance, there were other recession periods during legislative periods 7 and 9, which were associated with the oil crisis. Furthermore, there was also a historic event in 1982 with the break-up of the coalition government. Legislative period 14 also included another recession triggered by the dot-com crisis. During these recession periods, there is no significant correlation between Bundestag sentiment and FAZ sentiment.

Legislative period	Pearson's correlation	p_value	Government coalition
6 (1969-1972)	0.2855	0.3947	SPD-FDP
7 (1972-1976)	0.3611	0.1545	SPD-FDP
8 (1976-1980)	0.3737	0.1701	SPD-FDP
9 (1980-1983)	0.2598	0.4996	SPD-FDP
10 (1983-1987)	-0.1235	0.6167	CDU/CSU-FDP
11 (1987-1990)	**0.5859**	0.0171	CDU/CSU-FDP
12 (1990-1994)	**0.6021**	0.0176	CDU/CSU-FDP
13 (1994-1998)	-0.1632	0.5314	CDU/CSU-FDP
14 (1998-2002)	0.4193	0.1198	SPD-GRÜNE
15 (2002-2005)	-0.2245	0.4830	SPD-GRÜNE
16 (2005-2009)	**0.5450**	0.0290	CDU/CSU-SPD
17 (2009-2013)	0.4230	0.1026	CDU/CSU-FDP
18 (2013-2017)	-0.4711	0.0655	CDU/CSU-SPD
19 (2017-2021)	**0.6621**	0.0052	CDU/CSU-SPD

Table 2: Correlation between FAZ sentiment and Bundestag sentiment per legislative period

Interesting to note is that FAZ sentiment has a significant correlation with Bundestag sentiment, particularly during periods of recession, when the government is led by the CDU (LP 12, 16, 19). However, a detailed correlation analysis of the parties by legislative period does not allow us to draw any clear conclusions (see Appendix C).

5 Granger causality

To learn more about the dynamic relationship between the two sentiment time series, we apply Granger causality tests (Granger, 1969).[2] Firstly, to avoid erroneous interpretations and spurious regressions, the time series are tested for stationary. According to the Augmented Dickey-Fuller (ADF), the Bundestag and FAZ sentiment growth rate (GR) series are stationary at the 5% significance level.

Following the Akaike (AIC) information criterion´s recommendation, we model a VAR with five lagged values and a constant.[3] We then apply Granger causality tests. Furthermore, the confidence intervals for the Granger causality tests are determined using heteroskedasticity-robust standard errors. The null hypothesis of each test is that the joint impact of all lagged values of the sentiment GR Bundestag series has no significant additional effect on predicting the future values of the sentiment GR FAZ series, and vice versa. The results of these tests are presented in Table 3.

Null Hypothesis	F-Test	df	P-value
Bundestag does not Granger-cause FAZ	2.2346	df1 = 5, df2 = 380	0.0503
FAZ does not Granger-cause Bundestag	3.4451	df1 = 5, df2 = 380	0.004668

Table 3: Results of the Granger Causality Tests with heteroskedasticity-robust standard errors

The results of the tests show that the lagged values of the Bundestag sentiment GR series have an additional significant influence on the future development of the FAZ sentiment GR series at a level of 10%, and that the

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[2]These tests analyze whether the past values of a time series X provide an additional contribution to anticipating the future values of time series Y, beyond the information contained in the past values of Y itself. This test is based on a bivariate vector autoregressive (VAR) model (Sims, 1980).

[3]Information criteria are used to estimate the optimum lag length. We assume a maximum lag length of eight quarters, as this allows any seasonal effects to be absorbed in any case. In addition, eight quarters generally correspond to half a legislative period. As 206 observations are available, the Akaike criterion serves as a basis for deciding on the optimum lag length.

lagged values of the FAZ sentiment GR series have an additional significant influence on the future development of the Bundestag sentiment GR series at a level of 1%. Indeed the sentiment series are Granger-causal on each others sentiment, thus supporting the interconnectedness between political debates and media reporting.[4]

6   Conclusion

In this paper, we investigate (possible) differences between political debates and their representation in the media. In particular, we consider fiscal policy sentiment in Germany. One of the indices is constructed solely based on the parliamentary data (presented by Latifi et al. (2024)). The second one is constructed based on economy-related articles from *Frankfurter Allgemeine Zeitung* (FAZ). We show that FAZ fiscal sentiment positively correlates with Bundestag fiscal sentiment, especially during recession periods. Moreover, we find Granger causality between the sentiment series in both directions, thus, supporting the interconnectedness between political debates and media reporting.

Acknowledgments

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[4]To ensure the correct specification of the model, we also conduct a Jarque-Bera test and a Portmanteau test / Breusch Godfrey test. The residuals are not normally distributed and not autocorrelated.

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Appendices

Appendix A   Economy related keywords

Ausgabendisziplin, Ausgabenlast, Budget, Budgetdefizit, Budgetdisziplin, Budgetüberschuss, Bundeshaushalt, Bundesschuld, Defizit, Defizitgrenze, Defizitquote, Einkommensteuer, Finanzpolitik, finanzpolitisch, Finanzplanung,

Finanzverfassung, Finanzierungssaldo, Finanzplanung, Fiskus, fiskal, Fiskalregel, Fiskalpakt, Fiskalunion, Goldene Regel, Haushaltsdefizit, Haushaltsgesetz, Haushaltsplan, Haushaltsüberschuss, Haushaltsdisziplin, Haushaltsrisiko, konjunkturelles Defizit, Konsolidierung, Kreditaufnahme, Maastricht, Mehrwertsteuer, Militärausgaben, Nachtragshaushalt, Neuverschuldung, öffentliche Finanzen, öffentliche Ausgaben, öffentliche Einnahmen, öffentliche Haushalte, Primärüberschuss, Primärdefizit, Quellensteuer, Rücklagen, Rückstellungen, Rüstungsausgaben, Schuldenabbau, Schuldenbremse, Schuldengrenze, Schuldenpolitik, Schuldenstand, Schuldentilgung, Schwarze Null, Solidaritätszuschlag, Sondervermögen, Steuern, Steueraufkommen, Steuereinnahmen, Steuererleichterung, Steuerreform, Steuerquote, Steuerpolitik, Steuerlast, Steuerschätzung, Steuerschlupflöcher, Steuersenkung, Steuerentlastung, Staatshaushalt, Staatskonsum, Staatsquote, Staatsverbrauch, Staatsverschuldung, Stabilisatoren, Stabilisierungspolitik, Strukturpolitik, strukturelles Defizit, Subventionen, Subventionsabbau, Subventionsbericht, Unternehmenssteuer, Zinsausgaben, Zinsentwicklung

Appendix B   FAZ Data: Preprocessing

A news article contains 575 words on average and 485 on median before preprocessing. Analogous to Latifi et al. (2024), we apply standard preprocessing steps to the FAZ corpus. To enrich the news articles with helpful textual information, we merge the title with the news text. Afterwards, the texts are lemmatized, then we convert the German umlauts and the "ß" to their dot-free equivalents ("ae", "oe", "ue") and "ss", respectively. We remove numbers, special characters, punctuation as well as one element words. Moreover, the stop words list from Latifi et al. (2024) is applied to remove stop words. Further, we remove very short and very long articles from the corpus by looking at the text length distribution. All articles that contain less than 104 or more than 2967 words, which corresponds to the 5% percentile or the 99.5% percentile, are excluded from the corpus. This ultimately results in $217,239$ articles and $42,631,380$ words remaining in the corpus. After preprocessing, the articles contain about 196 words on average.

Appendix C Correlation analysis based on party affiliation

In chapter 4, we note that FAZ sentiment has a significant correlation with Bundestag sentiment, particularly during periods of recession, when the government is led by CDU/CSU (e.g. legislative periods 12, 16, 19). To analyze whether FAZ favors a certain course in policy-making, we calculate correlation coefficients between single parties and FAZ sentiment per legislative period.
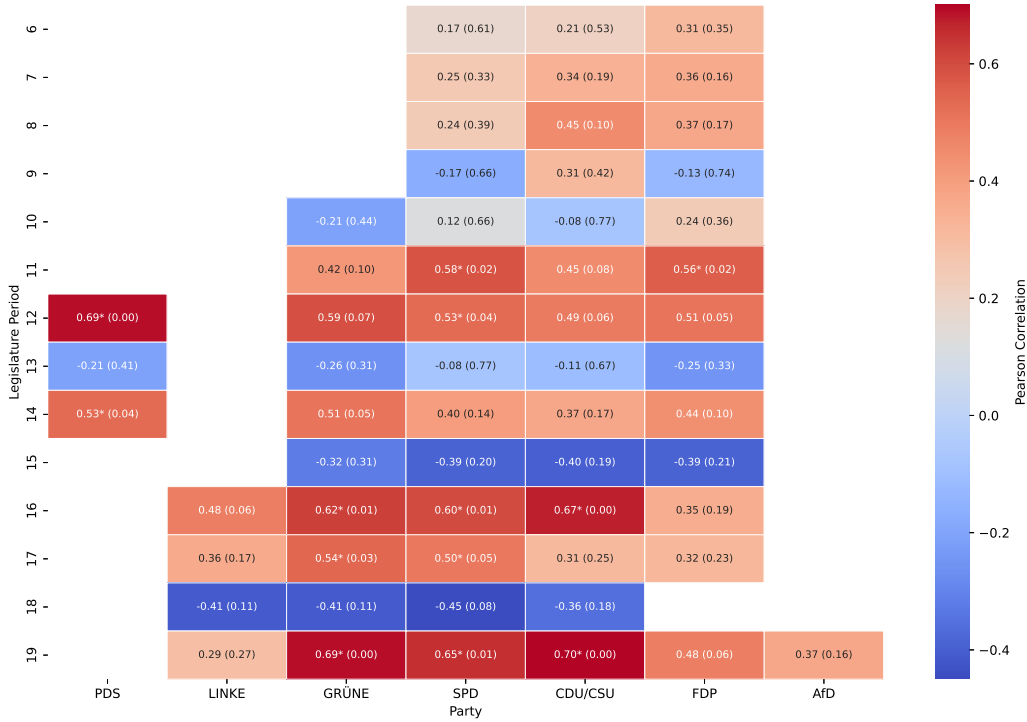

Figure C.1: Heatmap of pairwise Pearson's correlations with FAZ-Sentiment by period

During recessions in legislative periods 7, 9 and 14, the government was led by the SPD. However, the correlation with FAZ sentiment is not significant. Based on Figure C.1, we find that in LP 7, CDU/CSU sentiment exhibits a higher correlation with FAZ sentiment than SPD sentiment does. In LP 9, SPD sentiment is even negatively correlated with FAZ sentiment,

whereas CDU/CSU sentiment remains positive. However, this does not hold in legislative period 14, where both parties show nearly equal correlations with FAZ sentiment. Furthermore, during recessions under SPD-led governments, party-based correlations are not significant for either SPD or CDU/CSU.

During recessions in legislative periods 12, 16 and 19 the government was led by the CDU/CSU. Here, the correlation with FAZ sentiment is significant. Based on Figure C.1, we find that in LP 16 and 19, CDU sentiment is highly and significantly correlated with FAZ sentiment. In contrast, this is not the case for legislative period 12.

Appendix D   Further details on Granger causality tests

According to the Augmented Dickey-Fuller (ADF) test, the standardized time series of the Bundestag is stationary at a 5% significance level. However, this does not hold for the standardized sentiment time series of the FAZ. Therefore, the growth rates of the sentiment series are considered. This involves approximating growth rates by calculating the first differences of the sentiment series after applying a logarithmic transformation. To enable logarithmic transformation, a value of 1 is added to each value in the series, ensuring there are no negative numbers. Based on the ADF test, the sentiment growth rate (GR) series are now stationary at the 5% significance level.