



School of Economics and Management

Examining the Impact of Merger Control on Media
Plurality in the Netherlands
Evidence from the Sanoma - DPG Merger

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Abstract

A diverse media sector is crucial for holding governments accountable, facilitating informed voter decision-making, and supporting democratic societies. This study utilizes the Reuters Digital News Report dataset to investigate the impact of media mergers on media plurality in the Netherlands from 2016 to 2023. The findings first demonstrate a substantial decrease in media plurality, largely attributable to mergers and acquisitions, underscoring the significant role these mergers have played in shaping the current media landscape. Next, the study examines the effect of the largest media merger during this period —the takeover of Sanoma by DPG Media— on consumers’ political leanings and trust in news. Through the use of the synthetic difference-in-differences approach in the media industry context, the study finds no evidence of a political shift post-takeover. However, an increase in trust in news among Sanoma consumers post-takeover is found.

Introduction

In modern democratic societies, a robust and impartial media sector plays a crucial role in ensuring transparency, facilitating well-informed decision-making, and guarding against the manipulation of public opinion. Ensuring a diverse media landscape characterized by a variety of independently owned sources, also known as media plurality (Prat, 2015), is therefore essential for a functioning democratic system (European Commission, 2016). Plurality serves as a foundational element for democratic societies and is a central tool for fostering a common culture and creating a shared space for public debate, allowing for diverse perspectives to coexist and engage with one another (Karppinen, 2007).

The Netherlands, like many other countries, has seen notable instances of media consolidation, such as the takeover of TMG by Mediahuis, the takeover of Sanoma by DPG Media, and the potential acquisition of RTL Nederland by DPG Media. Globally, reports such as the *Who Owns the UK Media?* study have revealed alarming trends, with only three companies controlling 90% of the UK’s national newspaper market (Media Reform Coalition, 2023). Similarly, Vivendi’s acquisition of the Lagardère Group highlights the consolidation of the media industry in France (European Commission, 2023).

Consequently, the topic of media plurality has become increasingly prominent in the public debate. The acquisition of Sanoma by DPG Media in the Netherlands in 2020 has stirred concerns regarding media plurality, leading to parliamentary questions¹ and critical comments of the Dutch Association for Journalism.² Globally, prominent media economists have expressed concerns regarding media plurality over Vivendi’s potential takeover of Lagardère in France (Angelucci et al., 2023). The Media Pluralism Monitor (MPM) by the European University Institute classifies many EU countries as medium or high risk (Centre for Media Pluralism and Freedom, 2023).

While media plurality has become a significant topic of discussion in the public debate, policy decisions aimed at preventing mergers due to concerns about their impact on media

¹Sneller, J. & Verhoeven, T. (2019). Parliamentary questions regarding the acquisition of Sanoma by DPG Media. Retrieved from <https://www.tweedekamer.nl/kamerstukken/kamervragen/detail?id=2019Z25155&did=2020D02354>

²Villa Media. (2019). Critical comments by the Dutch Association for Journalism. Retrieved from <https://www.villamedia.nl/artikel/dpg-media-neemt-sanoma-media-netherlands-over?cduid=a3a4d418-759f-426b-a414-b6037d5dab02>

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plurality remain relatively limited. The UK’s Competition and Markets Authority (CMA) stands out as the notable exception, having opposed Fox’s proposed takeover of Sky due to concerns regarding media plurality (CMA, 2017). Similar interventions based on media plurality considerations have not yet been observed within the context of Dutch merger control.

Questions remain about the true extent of media plurality in the Netherlands and how the trend of consolidation might impact it. Existing research offers limited insights, highlighting the need for more thorough investigation. This study aims to fill this gap by deploying a new dataset that allows for deeper insights into the evolving state of Dutch media plurality over time.

Employing the theoretical framework of media plurality proposed by Prat (2018), which uses relative consumer engagement with media sources to calculate the potential power that media outlets yield over the democratic process, this study analyzes the evolution of media plurality and the effect of past and potential future mergers and acquisitions (M&As) on media plurality in the Netherlands. The study evaluates the impact of M&As on media plurality metrics by comparing the beginning (2016) and the end (2023) of the study period under the scenario of the actual ownership structure (*actual conglomerates*) and the original ownership structure at the beginning of the study period (*original conglomerates*).

While changes in media plurality are significant in their own right, they do not necessarily translate into shifts in the political behavior of consumers. To explore this question, the study employs a synthetic difference-in-differences approach, examining the largest media merger in recent Dutch history: the acquisition of Sanoma by DPG Media. This analysis aims to assess the merger’s effects on political leanings, which influence voting behavior, and on trust in news, which reflects how citizens learn about politically relevant events.

Summarizing, this study aims to explore the impact of merger control in the media industry between 2016 and 2023 on media plurality in the Netherlands. Additionally, it investigates the potential effects of changes in media ownership on consumers, specifically examining whether the political leanings and trust in news among Sanoma consumers were affected after the takeover by DPG Media. By addressing these topics, this research aims to contribute to the discourse on media plurality and its democratic impact. This study

marks the first longitudinal quantitative empirical research on Dutch media plurality, offering valuable insights for scholarly discourse and evidence-based policymaking.

The results show a consistent negative trend in media plurality over the study period when including common ownership, further amplified by the anticipated acquisition of RTL by DPG Media in 2024. The demographic differences identified among consumers of various acquired news outlets suggest potential heterogeneous effects of changes in ownership on different subgroups of the population. While our preliminary results indicate no significant shift in the political leanings of Sanoma consumers post-takeover, they reveal an increase in trust in news among Sanoma consumers compared to their synthetic counterparts. This suggests a potential shift in consumer perception and engagement with news content.

The paper proceeds as follows. Section 2 presents a literature review on the media plurality, media ownership, and the relation between media and political outcomes. Section 3 presents a model of media influence and defines the notions of attention share and media power presented by Prat (2018). Section 4 describes the Reuters dataset, presents descriptive statistics, and discusses limitations of the dataset. Section 5 covers the descriptive analysis of the evolution of media plurality. Section 6 presents a study on the effects of the takeover of Sanoma by DPG Media on political leaning and trust in news. Lastly, section 7 concludes by discussing the relation between the findings and literature and providing possible implications of the findings for policymaking and future research.

Literature Review

Media Plurality

Media plurality can be understood through various lenses, from the “marketplace of ideas” model rooted in economic and political liberalism to a functional perspective tied to the “public sphere” (European Union, 2022). The latter, linked to deliberative democracy, emphasizes the necessity of diverse media sources for robust democratic engagement.

In this context, Prat’s definition of media pluralism offers a unique angle. Prat underscores the media industry’s indirect impact on societal welfare through information exter-

nalities that influence policymaking (Prat, 2018). Media concentration affects more than market dynamics; it can shape democratic decision-making and enable news manipulation (Prat, 2015). Prat advocates for a shift from platform-centric analyses to evaluating individual voter perspectives, focusing on how different news outlets impact voters. This approach uses the concept of attention shares to capture consumers’ relative attention to various media outlets, offering insights into the media power of conglomerates and integrating media plurality considerations into market analyses.

Kennedy and Prat (2018) apply Prat’s framework to assess the impact of major news organizations on electoral dynamics across 36 countries in 2017, using individual-level survey data on news consumption. They derive attention shares to compute a power index that measures the potential influence of media outlets on democratic processes. Their findings reveal a global trend of media power concentrated in a few outlets, with a strong correlation between socioeconomic inequality and information inequality. In the Netherlands, their analysis identifies a concentrated media landscape, dominated by the large public service broadcaster, with the top three media conglomerates holding about one-third of the total attention share including social media companies.

Media Capture

Increasing consolidation of media ownership and the erosion of plurality present significant risks, particularly in the context of increased vulnerability to ‘media capture’ (Besley and Prat, 2006). Media capture occurs when governments exert influence over media coverage, thereby undermining the media’s role in holding public power accountable. According to the authors’ model, two key factors complicate the process of capture: media plurality and transaction costs between the government and the media.

Enikolopov and Petrova (2015) provide comprehensive empirical evidence of media capture worldwide, with notable examples from Fujimori’s Peru (McMillan and Zoido, 2004) and Berlusconi’s Italy (Durante and Knight, 2009). These findings illustrate the harmful effects of media capture on media independence and underscore the risks associated with changes in media plurality.

Media Ownership and Plurality

The relationship between media ownership concentration and media plurality has been a focal point of scholarly debate. Cage et al. (2022) investigated how television show hosts influence political representation through guest selection. Similarly, Hendrickx and Ranaivoson (2021) found evidence for an increase in news recycling in Belgium post-Mediahuis consolidation. Additionally, Beckers et al. (2019) found that newspapers owned by the same media group are more alike content-wise than independently owned newspapers.

The risk of media recycling and loss of editorial independence have gathered increasing public attention. Mediahuis, the Belgian owner who took over Telegraaf Media in 2017, has announced plans to merge the three independent publishing firms into a single organization with a unified management team. Additionally, DPG Media will consolidate operations in a central office starting in 2024, housing all major DPG brands, which further increases the risk of news article recycling and loss of editorial independence.

Media and Political Outcomes

DellaVigna and Kaplan (2007) provided compelling evidence on how media content influences political attitudes. Their analysis showed that Fox News's entry into local markets affected Presidential elections between 1996 and 2000. Similarly, Chiang and Knight (2011) found that endorsements are influential in the support for recommended candidates. This suggests that voters do rely on the media for information during election times.

Additionally, the spatial theory of news consumption and electoral competition developed by Chan and Suen (2008) demonstrated that media outlets strategically position themselves to attract voters with extreme views.

In the context of the Netherlands, understanding these dynamics is vital for assessing the potential impacts of media consolidation, particularly the potential effect of reduced media diversity on the shifting political leanings and trust in news of media consumers.

Empirical Strategy: Synthetic Controls and Synthetic Difference-in-Difference

To investigate the trends in media power and the effects of changes in media ownership on the political leaning of consumers in the Netherlands over the last decade, this paper builds on the theoretical framework established by Prat (2018), and employs the synthetic control method developed by Abadie et al. (2010), in which a control unit mirroring the characteristics of the treated unit before the intervention is constructed. This approach facilitates the estimation of the effect of the intervention – the acquisition of Sanoma by DPG Media - by comparing post-intervention outcomes between the treated unit and its synthetic counterpart.

Furthermore, this study incorporates the synthetic Difference-in-Differences (DID) estimator introduced by Arkhangelsky et al. (2021). Unlike traditional methods, this estimator merges the robustness of the synthetic control method with the difference-in-differences framework to establish causal inference. Notably, this paper pioneers the application of the synthetic DID estimator within the media industry.

By employing these advanced empirical strategies, this study aims to provide a comprehensive analysis of how media consolidation in the Netherlands has impacted the political leaning and trust in news of media consumers. The synthetic control method, combined with the synthetic DID estimator, allows for a robust examination of the causal effects of media mergers.

Theoretical Foundations

Following Prat (2018), the focus of this theoretical discussion is on the elaboration of the theoretical underpinnings of the framework, particularly concerning the concepts of attention share and media power.

In accordance with Prat (2018), the entirety of media outlets within the Netherlands in a period is defined as $\mathbf{M}_t$. These outlets encompass various platforms such as newspapers, television networks, or radio stations. Voters can then be classified based on their interac-

tion with a subset of these media outlets, denoted as $M_t \subset \mathbf{M}_t$, which they engage with. Furthermore, let q_{mt} represent the proportion of voters who exclusively engage with all outlets within subset M_t (and no others) in period t , while $q_{\emptyset t}$ represents the share of those abstaining from all the media outlets in a period. It follows that the sum of the proportions of voters across all subsets M_t equals 1, denoted as $\sum_{M_t \subset \mathbf{M}_t} q_{mt} = 1$.

Media Consumption Matrix

The set of all subsets M_t collectively forms the so-called ‘media consumption matrix’ of a given year. This matrix provides valuable insights into voters’ relative engagement with various media outlets. In the matrix, each column represents a distinct media outlet, while each row corresponds to segments of individual consumers within the general population.

A segment, in this context, is a proportion of the population that shares the same media consumption pattern, i.e. respondents in a segment consume the exact same media outlets. A simplified depiction of this matrix, reflecting the Dutch media landscape, is presented in Table 3.

For example, the hypothetical matrix reveals that 25% of the population exclusively consumes television from outlet NOS, while 25% consume both NOS and RTL. Furthermore, 20% of the population engages with NOS, Volkskrant, and NRC jointly. Calculating the reach for each outlet demonstrates NOS with a 70% reach, followed by RTL and NRC.

Upon examination of the consumption information, one might be tempted to conclude that the reach of each media outlet directly correlates with its influence on the democratic process. However, a closer look at the media matrix reveals significant differences among media outlets. For instance, Nu.nl serves as the sole news provider for 15% of the population, while NRC shares its consumers with two other media outlets within two segments.

Attention Share

Prat (2018) introduces the concept of attention share to address these nuances. In every segment, each outlet is assigned an attention share of 1 if it is the exclusive medium used, $1/2$ if two outlets are utilized, and so forth. The total attention share for each outlet is then

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Table 1: Media Consumption Matrix

Segment	Share (%)	Media Consumption				
		NOS	RTL	Volkskrant	NRC	Nu.nl
1	25	X				
2	25	X	X			
3	20	X		X	X	
4	15		X		X	X
5	15					X
Reach		70%	40%	20%	35%	30%
Attention share		44.2%	17.5%	6.7%	11.7%	20.0%

Note: For the example used in the paper of Prat (2018), see Journal of Political Economy, v.126n.4, p.1752.

derived as the weighted average across all segments. Utilizing this concept in the hypothetical analysis reveals variations among media outlets. For instance, while Volkskrant may have a 20% reach in segment 3, its attention share is diluted by concurrent usage of NPO and NRC in that segment. In contrast, NOS and Nu.nl have more concentrated attention shares. Furthermore, despite NRC having a wider reach than Nu.nl, the latter may possess a higher attention share, due to its prevalence as the primary news outlet for a certain segment of the population.

Media Power

Prat (2018) introduced the concept of a news consumption matrix as the foundation for constructing a media power index. This index, derived from attention shares, presents a hypothetical worst-case scenario demonstrating the maximum potential influence a media outlet could have on the political process. Essentially, it illustrates a situation where voters are completely unaware of any manipulation attempts by news outlets and are unable to counteract biases in the information they receive. In his study, Prat (2018) formulated the media power index within a simplified framework involving two political candidates, under the assumption of unbiased reporting. However, the Dutch political landscape is characterized by a multiparty system, which significantly differs from the two-party context in Prat’s original model. This complexity necessitates a different approach to measuring

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media power that accounts for the diverse range of political parties and the dynamics of coalition governments. Given these characteristics, this study moves away from the original media power index calculation proposed by Prat (2018). Instead, an alternative version of media power, proposed by Kennedy and Prat (2018), is utilized. It measures the percentage of voters that need to be naïve to swing a certain percentage of the vote. This approach fits the multiparty system of the Netherlands and provides a clearer understanding of media influence in the Dutch political environment.

In this alternative specification, the proportion of naïve voters required to influence 1%, 2%, and 5% of the votes is calculated based on the attention shares of the media outlets. Specifically, the calculations are as follows:

$$1\% \text{ vote swing: } \frac{1}{51 \times \text{attention share}}$$

$$2\% \text{ vote swing: } \frac{1}{26 \times \text{attention share}}$$

$$5\% \text{ vote swing: } \frac{1}{11 \times \text{attention share}}$$

These formulas help determine how many voters must be completely naïve—meaning they are unaware of any manipulation and cannot counteract biased information—to allow a media outlet to shift a given percentage of the vote when it performs biased reporting. By incorporating the concept that not all voters are naïve, the analysis is refined to better predict media influence.

For example, if a media outlet has an attention share of 30%, and we want to know the proportion of voters who need to be naïve to swing 1% of the votes, the calculation would be:

$$\text{Proportion of naïve voters: } \frac{1}{51 \times 0.30} = 6.54\%$$

This means that approximately 6.54% of the electorate would need to be naïve for the media outlet to swing 1% of the votes in an election. Similarly, the respective formulas can be used to determine the proportions for 2% and 5% vote swings. This refined approach provides a more accurate prediction of media power in the Dutch multiparty system, allowing for a detailed analysis of media influence on the political process. It also accommodates the

varying degrees of voter sophistication, offering a nuanced view of how media can impact election outcomes in the Netherlands.

Data

Data Source

The dataset utilized in this study comes from the Digital News Report (DNR), published by the Reuters Institute, and available through the Dutch Media Authority in Hilversum. Spanning from 2016 to 2023, this dataset consists of repeated cross-sectional data collected annually from approximately 2000 respondents surveyed during January and February each year.

The DNR dataset offers an array of variables essential for this study. It encompasses insights into news brand consumption patterns, demographic characteristics, media trust and political affiliations. Demographic data within the questionnaire include age, gender, and income. Political leaning is measured by assessing the average political leaning of media consumers on a scale from 1 (left-leaning) to 7 (right-leaning). Additionally, media trust is measured on a scale ranging from 1 (lack of trust in most news) to 5 (high level of trust in most news).

The DNR targets Dutch individuals aged 18 and above with internet access, which according to StatLine (2023), encompasses over 94% of the Dutch population from 2016 onwards. Thus, the dataset covers a significant portion of the Dutch population.

The sample collection methodology of the DNR involves assembling samples with representative quotas for age, gender, region and education. Furthermore, to ensure the robustness and representativeness of the data, weighting was applied to align with targets based on census and industry-accepted data.

Table 2 provides an overview of the dataset’s descriptive statistics and the balance across the years. While the dataset demonstrates balance in demographic representation across the years, one noticeable trend is the increasing proportion of high-income households from 2021 onwards.³

³This trend may be attributed to the static nature of the income brackets used as a variable in the

DATA

It is important to note that this dataset represents new data that has not been previously utilized empirically, thereby providing an opportunity for novel insights into media plurality. Additionally, this data spans the timeframe of two significant acquisitions within the Dutch media landscape: the acquisition of TMG by Mediahuis Group and Sanoma by DPG Media. Moreover, this dataset offers the potential to evaluate the potential merger of RTL and DPG given the state of media consumption patterns in 2023.

Table 2: Demographic Overview

Year	Respondents	Female %	Age (mean)	Political stance				Household income			Internet Penetration (%)*
				Left	Centre	Right	Don't know	Low	Medium	High	
2016	2006	0.51	48.7	0.16	0.45	0.16	0.23	0.22	0.50	0.28	94.4
2017	2006	0.51	49.2	0.17	0.47	0.15	0.21	0.24	0.49	0.27	97.1
2018	2010	0.50	49.1	0.18	0.48	0.14	0.19	0.22	0.50	0.28	96.5
2019	2026	0.52	48.6	0.52	0.46	0.15	0.20	0.22	0.50	0.29	97.0
2020	2014	0.52	49.0	0.17	0.48	0.14	0.20	0.20	0.51	0.29	95.6
2021	2006	0.52	49.3	0.15	0.51	0.15	0.18	0.21	0.46	0.34	97.4
2022	2003	0.51	49.8	0.10	0.46	0.16	0.19	0.19	0.45	0.37	96.8
2023	2022	0.51	49.5	0.14	0.44	0.17	0.21	0.18	0.44	0.38	97.8

Note: *based on CBS (2023).

Justification for DNR Dataset

Despite the absence of individual-level longitudinal panel data, the DNR dataset is directly aligned with the theoretical framework established by Prat (2018). This dataset provides valuable information on how consumers engage with news outlets, which is essential for constructing attention shares and a media power index (see Table 3).

The longitudinal scope of the DNR dataset spanning from 2016 to 2023 enables both prospective analysis of future M&As in the media sector and retrospective examination of past M&As. Furthermore, the dataset's comprehensive demographic variables allow for the identification of distinct effects among different subgroups, aligning well with the study's objectives.

By leveraging the DNR dataset, this study aims to explore the dynamics of media power and attention share within the Dutch media landscape, providing a detailed examination of how media mergers and acquisitions impact consumer behavior and media plurality. The

survey. Since these income brackets have remained unchanged over time, any rise in the share of high-income households might reflect broader economic shifts rather than a sampling bias.

rich cross-sectional data from the DNR serves as a solid foundation for this analysis, offering potential significant contributions to our understanding of media influence in the context of democratic processes.

Table 3: Questions Media Consumption

Survey.Question	Answer
Which, if any, of the following have you used to access news 'offline' in the last week?	BBC News, CNN, Al-Jazeera, de Telegraaf, Metro, AD, etc.
Which, if any, of the following have you used to access news 'offline' in the last week?	BBC News Online, CNN.com, BuzzFeed News, de Telegraaf online, etc.

Data Limitations and Considerations

Several limitations and considerations are associated with the DNR dataset. Because of the lack of panel data, the analysis is constrained in its ability to track individual changes over time, limiting the depth of insights into evolving media consumption patterns. The absence of a comprehensive panel dataset prevents the study from revealing changes in media consumption behavior over time and the long-term effects of media mergers and acquisitions on these behaviors.

Additionally, the DNR dataset lacks information regarding the duration of engagement with each news outlet. While it offers broader insights into usage frequency, it lacks specific data on the time spent on each outlet. This absence makes it challenging to accurately measure the level of attention given to specific news sources by consumers. Moreover, incorporating demographic variables would offer a nuanced understanding of how mergers and acquisitions affect various segments of the population differently. It is important to note that most other datasets, including the 2017 DNR dataset used in Kennedy and Prat (2018), also suffer from this limitation, making it a common issue in media consumption research.

Another notable limitation arises from the dataset's exclusion criteria regarding news consumption frequency. Prior to 2021, individuals reporting news consumption less frequently than once a month were excluded from the dataset. To maintain methodological consistency,

respondents with a media consumption frequency of less than once per month are excluded from the analysis from 2021 onwards. These limitations highlight the challenges inherent in analyzing media consumption patterns and emphasize the importance of careful consideration when interpreting the results. Despite these constraints, the DNR dataset remains a valuable resource for understanding media influence within the Dutch context.

A final consideration concerns the inclusion of social media sources in the analysis. News content initially created by one outlet may be picked up and reported on social media platforms, with or without editorializing or repackaging the original material. This raises a crucial consideration about the role of social media in the analysis. Unlike traditional news sources, the political news displayed on social media platforms is often determined by algorithms that are not transparent and can favor certain types of content. Due to the lack of information on the specific political news content that appears on these platforms, this study deviates from the approach of Kennedy and Prat (2018) and excludes social media sources from the analysis. This exclusion ensures that the focus remains on sources where the nature and origin of the political news are clear and traceable.

Evolution Media Plurality

Empirical Approach

The study begins by examining the evolution of media plurality in the Netherlands over time, focusing on the impact of media mergers and acquisitions. The methodology is based on the theoretical framework detailed earlier. The evolution of media plurality is based on five metrics: reach, attention shares, the Attention Herfindahl-Hirschman Index (AHHI), the share of the population needed to be naïve for a media outlet to control a particular vote share, and the distinct number of news sources used. By employing these measures, the study captures the dynamics of various metrics of media plurality, enhancing the robustness of the analysis.

Following the methodology outlined by Kennedy and Prat (2018), an AHHI is computed for each year. The HHI, a measure of market concentration, is adapted to assess the concen-

tration of media attention shares. This involves summing the squares of the market shares (attention shares) of all media outlets, providing a quantitative measure of media concentration over time. If all news consumed within a country originated from a single source, the index would reach a value of 10,000. Conversely, if news distribution were widely spread among numerous providers, the index would approach zero.

Additionally, the number of independent news sources used by individuals is also analyzed. Analyzing the number of independent news sources used by individuals offers an additional measure of media plurality, as it reflects the diversity of viewpoints and voices available to the audience, linking to the definition provided by the European Commission (2016). Furthermore, it is one of the parameters that determine the potential of media capture in the literature of Besley and Prat (2006).

All metrics used in the analysis are conducted at both the individual news outlet level and the media-owner (conglomerate) level. This dual-level approach ensures that the potential influence of specific outlets is captured, while also evaluating the overarching impact of their common owner. This distinction is particularly relevant as it allows for discerning between scenarios where editorial teams within a conglomerate operate independently versus situations where the conglomerate exerts significant control over editorial content.

To enhance the robustness of our analysis and extend the methodology of Kennedy and Prat (2018), an additional question of the Reuters' survey is utilized. Specifically, a question covering which news sources respondents used on three or more days in the last week is considered in the analysis (Table 4). This modification is not part of the baseline model, which solely considers sources used once every week.

After incorporating this new statistic into the analysis, the metrics of media plurality for the different media outlets are recalculated, considering all sources identified through the additional survey question.

Thereafter, the study empirically examines the relationship between mergers and media plurality from 2016 to 2024. By comparing media plurality metrics at the beginning and end of the period, the impact of media mergers and acquisitions is assessed under two scenarios: *actual conglomerates* and *original conglomerates*. This comparison isolates the effects of media mergers on attention shares and other media plurality metrics from the

Table 4: Questions Extension Media Consumption

Survey.Question	Answer
You said you have used the following brands to access news offline in the last week. . . Which of these, if any, did you use on 3 days or more?	BBC News, CNN, Al-Jazeera, de Telegraaf, Metro, AD, etc.
You said you have used the following brands to access news online in the last week. . . Which of these, if any, did you use on 3 days or more?	BBC News Online, CNN.com, BuzzFeed News, de Telegraaf online, etc.
<i>Note:</i> Question available in DNR from 2017 onwards	

changes resulting from organic growth of media conglomerates' underlying news brands.

It is important to note that this analysis does not imply causation. Instead, it examines how media plurality would have evolved if the ownership structure had remained unchanged, and individual news sources had followed the same trend as in both the original and actual conglomerate scenarios.

Evolution of Media Plurality: Results

The three largest news providers in 2023 – Mediahuis, DPG Nederland, and NOS – display varying contributions to media plurality over time (Figure 1). Mediahuis, initially not part of the top three news conglomerates, underwent a significant transformation following its acquisition of TMG in 2017, which led to substantial increases in both reach and attention share.

Considering the combined attention shares of NOS, DPG Nederland, and Mediahuis, an increase in attention share of 0.394 in 2016 to 0.588 in 2023 is observed. With the potential acquisition of RTL by DPG Media, this figure could increase to 0.708 in 2024. This implies that the top three media conglomerates will control more than three quarters of the total attention share of Dutch consumers, solidifying their dominance in the market.

DPG Media, the largest player in 2023, experienced significant fluctuations. DPG Media underwent sharp increases in reach and attention share after the Sanoma acquisition in 2020. The reach increased from 0.39 in 2016 to 0.646 in 2023, and the attention share of DPG Media

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rose from 0.126 in 2016 to 0.249 in 2023. This metric is projected to rise in 2024 with the potential RTL takeover by DPG Media.

Furthermore, alongside the shifts in attention shares, these major news providers also display varying trends in reach (Appendix A), with DPG Media having the most significant increase of 0.39 in 2016 to 0.646 in 2023. In the event of the potential acquisition of RTL by DPG Media, it is projected that the reach of DPG Media in 2024 will experience an increase of 18.2%, rising from 0.646 to 0.764.

Figure 1: Trend of Attention Shares

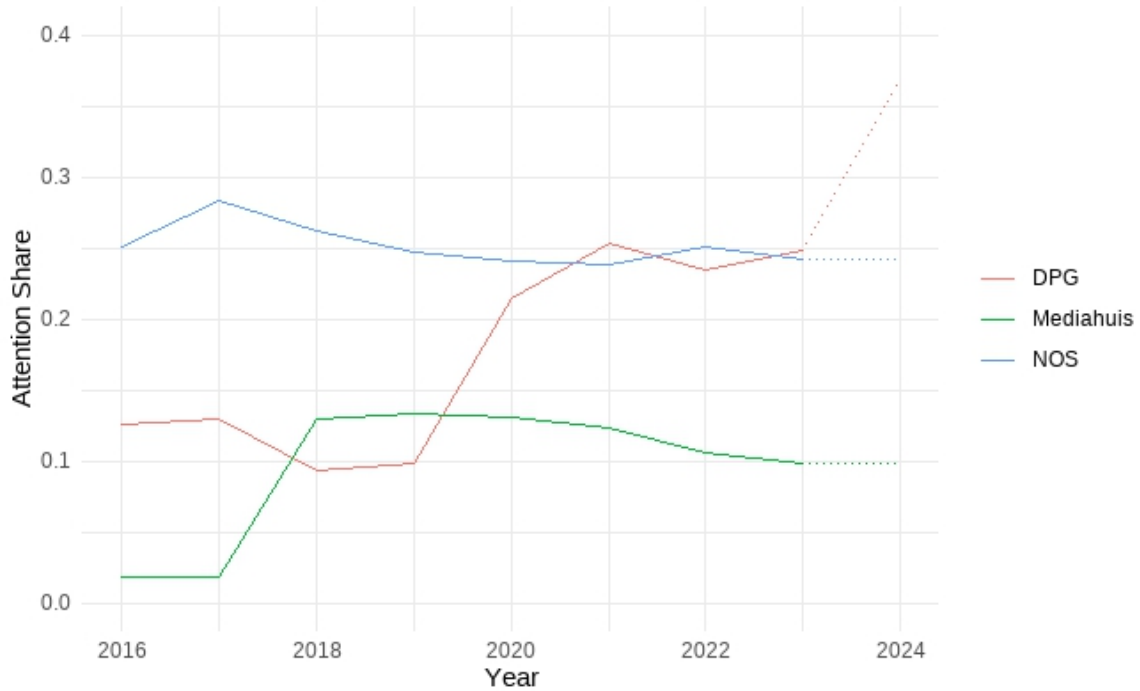


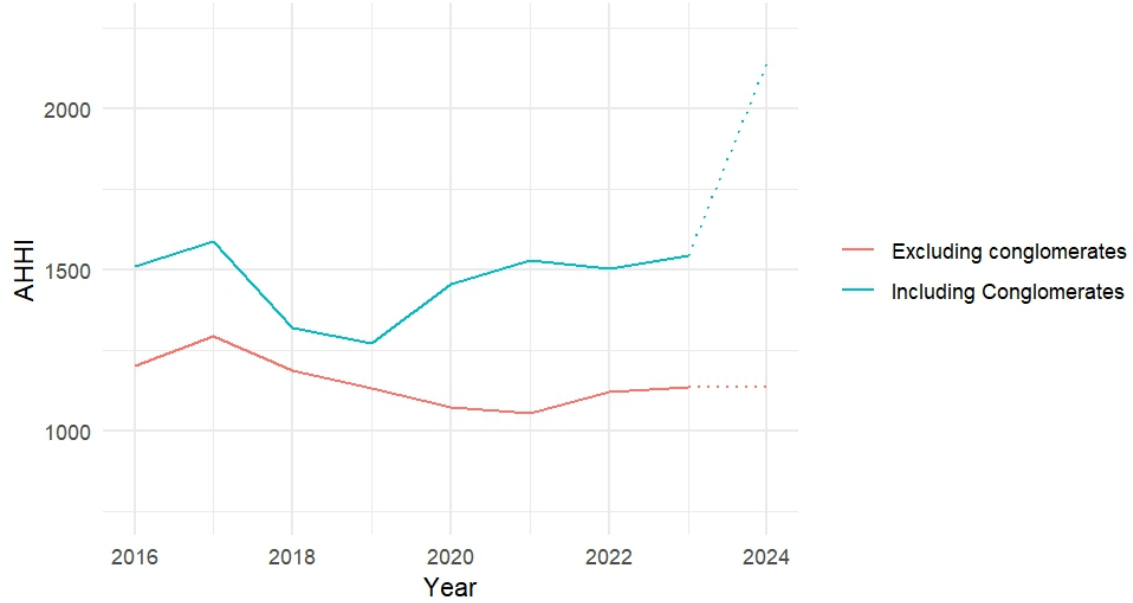
Figure 2 illustrates the fluctuations in the Attention HHI over time in the Netherlands. When analyzing individual sources while excluding common ownership, there is a slight decline in the AHHI values, decreasing from 1201 in 2016 to approximately 1135 by 2023, a reduction of 5.5%. This indicates a more even distribution of attention shares among individual sources in 2023 compared to 2016.

However, when common ownership is included, the AHHI shows an increasing trend from 2019 to 2023. The initial decline in AHHI was due to the takeover of SBS by Talpa Network, resulting in Sanoma losing part of its consumer base to a new competitor. After the acquisition of Sanoma by DPG Media, a rising trend in AHHI is observed. Looking ahead

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to 2024, assuming the attention shares remain constant from 2023, there is a projected surge in AHHI from 1542 to 2140 of 38.7%.

Figure 2: Trend of AHHI



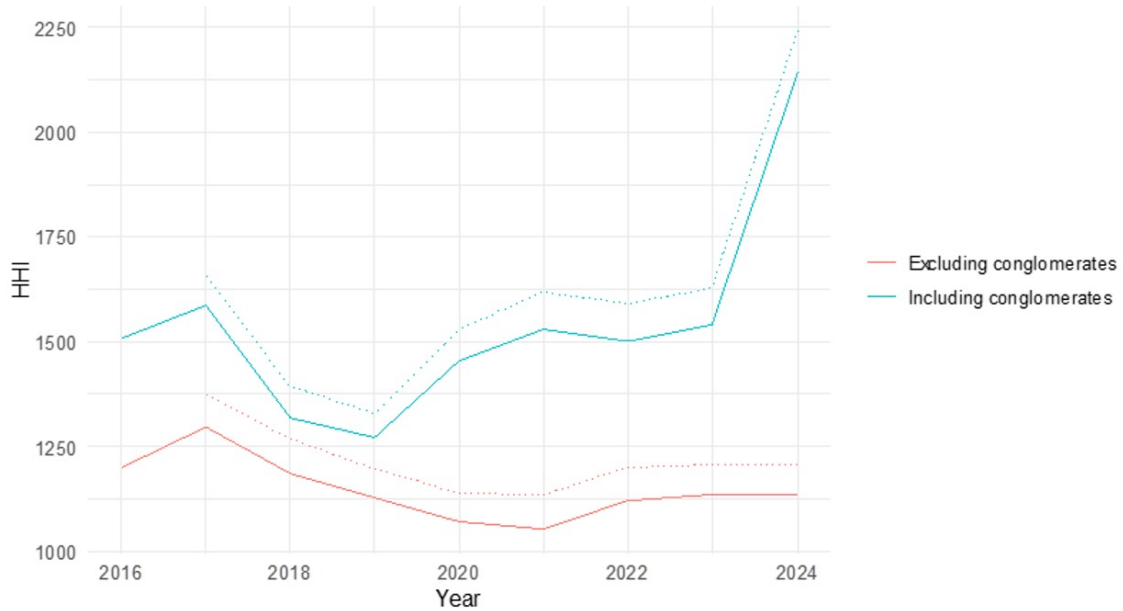
The number of distinct sources used by consumers increases from 2016 to 2022 when excluding common ownership (Appendix B). By 2023, the number of distinct sources used by consumers returns to the 2016 level of approximately four. However, when accounting for common ownership, and thus considering media outlets owned by the same conglomerate as non-distinct sources, the number of distinct sources is projected to drop to approximately 3.3 in 2024, representing a 11.5% decrease compared to 2016.

By examining the metric of the number of individuals susceptible to manipulation required to influence a certain percentage of the vote share, the analysis reveals significant shifts in media power dynamics. Specifically, DPG Media now requires merely 5.3% of the population to be susceptible to manipulation to swing 1% of the votes (Appendix C), a notable decrease from the 15.5% needed in 2016. In contrast, Mediahuis, which lacked the capability to sway a 1% vote share in 2016, now only needs 19.9% of voters to be susceptible to manipulation by 2023.

Time Spent on News

After integrating the supplementary question concerning news sources used on three days or more in the analysis, the Attention HHI exhibits a further increase, indicating a loss in media plurality compared to previous findings (Figure 3). This decline can be attributed to a significant portion of individuals relying on NOS as their primary news source, surpassing a frequency of three times a week (Appendix D). This observation suggests that the extent of media plurality erosion could be underestimated when the time spent on news consumption is omitted from the analysis.

Figure 3: Trend in AHHI extension



Note: Dotted line is the AHHI after inclusion of question regarding time spent consuming each news-outlet.

In summary, the analysis indicates that media plurality, based on individual sources, has remained relatively stable over time. However, a significant decrease in overall media plurality is shown after including common ownership among major media conglomerates. This decrease is evident across all metrics, particularly pronounced in the attention shares of the top three conglomerates and the Attention HHI. Additionally, the study highlights that the necessary percentage of individuals who would need to be naive for biased reporting to influence the democratic process has decreased.

Results Impact of Mergers

To assess the impact of mergers, a comparative analysis is conducted on media plurality metrics at the beginning and end of the sample period, considering actual changes in ownership against a hypothetical scenario wherein ownership structures remain unchanged since the original structure in 2016.

Figure 4 highlights the Attention Shares of the top three media conglomerates in 2023 for both the actual and original ownership groups. In the original conglomerates group, the top three media conglomerates had a total attention share of 0.368. In contrast, this share increased to 0.589 in the actual conglomerates group, representing a 60% increase compared to the original group.

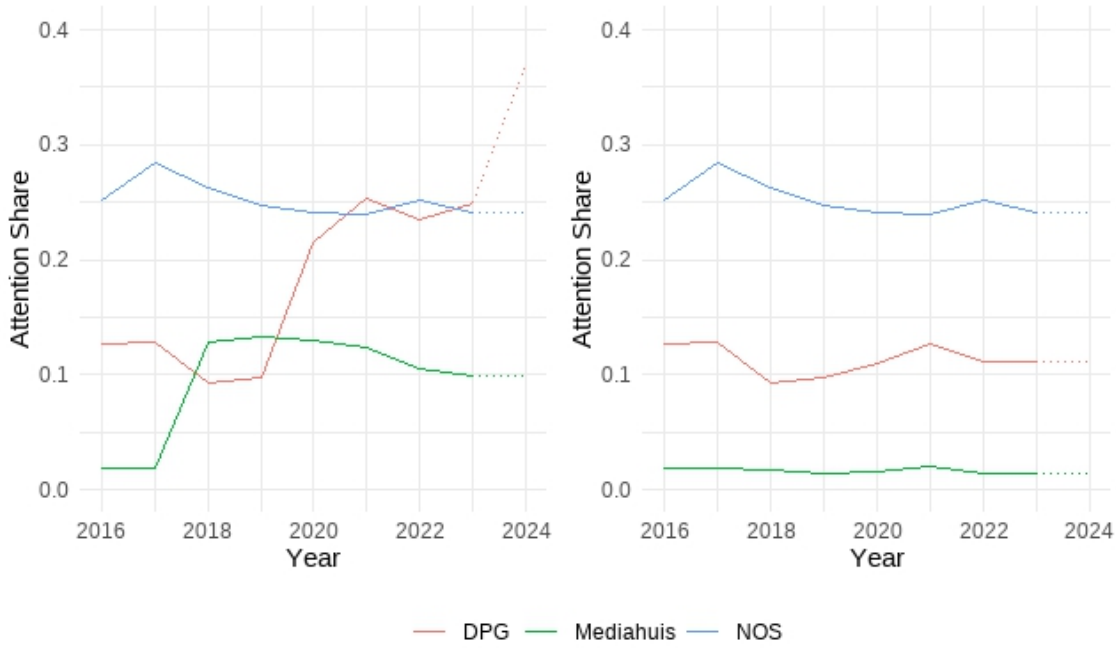
Furthermore, given that the ownership structure would remain unchanged from 2016 to 2023, the top three conglomerates in the original conglomerates group would have experienced a slight decrease in total attention share, whereas in the actual conglomerates, the group showed an increasing trend. This shift indicates that the observed increase in the actual conglomerates group can be attributed entirely to mergers and acquisitions, rather than the organic growth of the underlying news outlets.

Figure 5 compares the trend of Attention HHI. After 2020, the actual conglomerates group exhibits higher Attention HHI values. A comparison between 2016 and 2023 reveals a modest decline in AHHI for the original conglomerates' top three, from 1509 to 1415. This decline indicates that the attention shares of the biggest underlying brands have decreased. In contrast, the actual conglomerates group shows a marginal increase in AHHI from 1509 to 1541, resulting in the total Attention HHI being 8.9% higher in the actual conglomerates group.

Including 2024, the potential Attention HHI increases substantially in the actual conglomerates group, marking a departure from the stable trend in media plurality observed from 2016 to 2023. This change is driven by the hypothetical takeover of RTL by DPG Media, resulting in an AHHI of 2140, which is 51% higher than in the original conglomerate scenario. Given the stable trend in AHHI in the original conglomerates group, the increase of AHHI in the actual conglomerates group indicates that the observed increase in the actual

EVOLUTION MEDIA PLURALITY

Figure 4: Attention Share Actual Conglomerates (left) and Original Conglomerates (right)



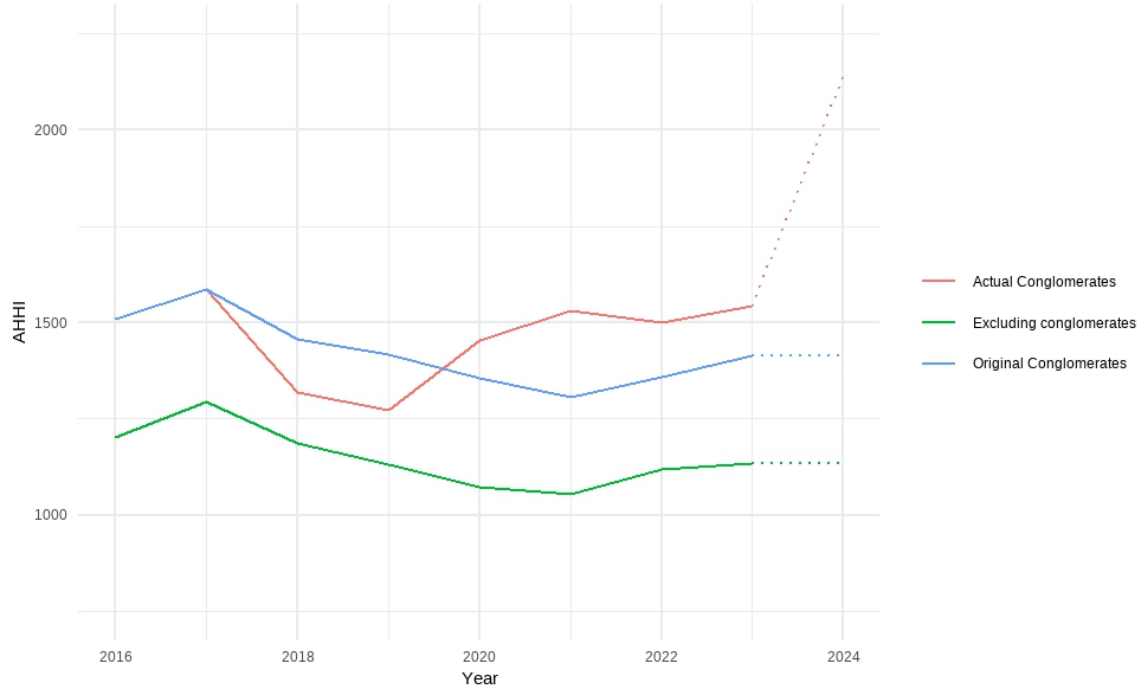
conglomerates group can be attributed entirely to mergers and acquisitions, rather than the organic growth of the underlying news outlets.

Including actual conglomerates in 2024, the number of distinct sources used experiences a potential decline of approximately 11%, from 3.72 in 2016 to 3.31. This decline is primarily attributed to the RTL acquisition by DPG Media (Appendix E).

In conclusion, this study employs a descriptive approach to examine the extent to which changes in media plurality can be explained by (anticipated) mergers occurring between 2016 and 2024, under the assumption that the trends in underlying media outlets remain unaffected by industry consolidation during this period. The findings suggest that shifts in media plurality metrics in the actual conglomerates group can be attributed almost entirely to mergers and acquisitions, rather than organic growth of the underlying news outlet.

The decreasing trend in media plurality and the impact of mergers and acquisitions is consistent with trends in other European countries. For example, in Belgium, Mediahuis is gaining prominence (Hendrickx and Ranaivoson, 2021), and in France, the Bolloré group is expanding its influence in the media industry (Angelucci et al., 2023).

Figure 5: Trend of AHHI original conglomerates vs. actual conglomerates



It is important to consider the notion of the ‘failing firm defence.’ From the theory follows that while a merger could potentially lead to a decrease in media plurality, the acquired firm might otherwise have faced bankruptcy and been removed from the media-outlet mix entirely. This scenario nuances the findings, suggesting that the possibility exists that mergers may have actually preserved media plurality by preventing the complete loss of outlets.

Potential effects of mergers on media plurality within different subgroups of population

While the overall impact of these mergers on media plurality metrics is substantial, it is essential to recognize that this impact might not be uniform across all subgroups of the population. Different subgroups may have distinct media consumption patterns, leading to varying effects on media diversity and accessibility. To gain deeper insight into these potential differences, the next part of the analysis examines how the attention shares attributed to acquired news brands vary among specific subgroups of the population.

Following the methodological framework outlined by Kennedy and Prat (2018), this study

employs Ordinary Least Squares (OLS) regression to examine variations in demographic background characteristics of consumers across different acquired outlets in the year preceding the takeover. The dependent variable in this analysis is the attention share attributed to the acquired brands. By adopting this approach, the study aims to show which subgroups of the population demonstrate a greater attention share toward acquired news brands.

The primary objective of this analysis is descriptive in nature. Rather than drawing causal conclusions. Through this approach, the study aims to pinpoint potential issues within the consumer bases of specific brands. Specifically, higher attention shares among certain subgroups suggest that takeovers might have heterogeneous effects across different segments of the population.

Telegraaf Media Group (TMG) by Mediahuis

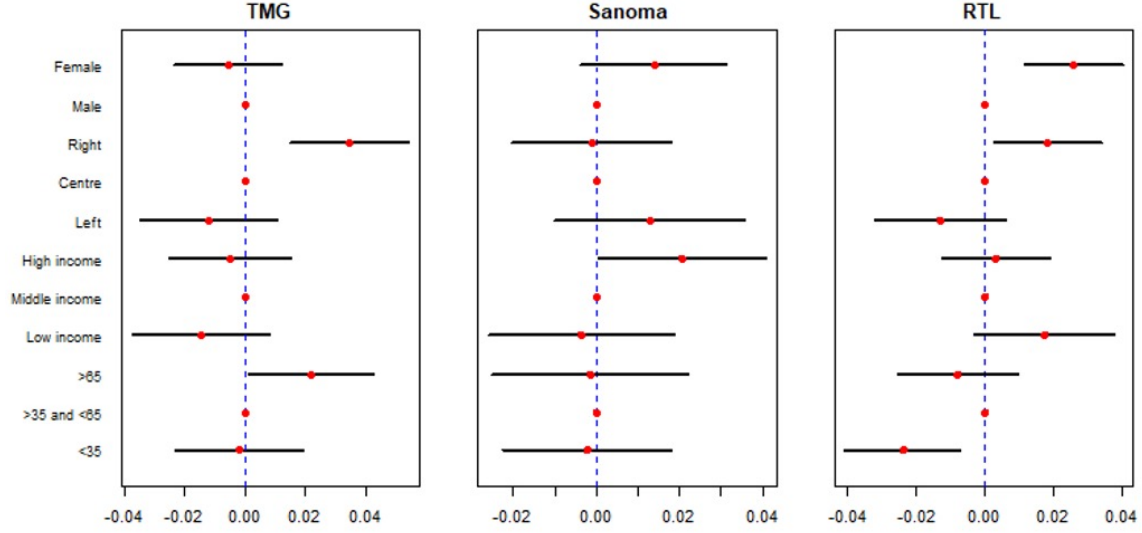
For the acquisition of TMG by Mediahuis, the analysis reveals a statistically significant difference between individuals identifying as right-leaning on the political spectrum compared to those identifying as center-leaning. On average, right-leaning respondents exhibit an attention share approximately 0.035 higher than center-leaning respondents.

Furthermore, the analysis indicates a significant disparity in attention shares for Telegraaf Media between respondents aged over 65 and those aged between 35 and 65. The confidence interval for respondents over 65 does not encompass zero, indicating a statistically significant difference in attention shares between these age brackets.

Sanoma (Nu.nl) by DPG Media

The analysis reveals no significant differences in attention shares based on gender, age, or political leaning for Sanoma consumers in 2019, the year prior to the takeover of Sanoma by DPG Media. However, a notable finding emerges regarding respondents in the high-income bracket, who exhibit a higher average attention share for Sanoma compared to those in the middle-income bracket. On average, high-income respondents display a 0.02 higher attention share for Sanoma than middle-income respondents. This discrepancy constitutes approximately 20.9% of Sanoma's total attention share of 0.096 in the overall population.

Figure 6: OLS Background Characteristics of Acquired Outlets



Note: Data from Reuters 2017, 2019, 2023. Outcome variable is Attention Share. Multivariate OLS. Plots show 95% confidence intervals.

RTL by DPG Media

The background characteristics of RTL consumers display a broader distribution compared to Sanoma. Significantly different patterns emerge across gender, age, and political leaning. Primarily, RTL is predominantly consumed by females, with a notable 0.026 higher attention share compared to males. Additionally, individuals in the age group under 35 demonstrate significantly lower consumption of RTL compared to those aged 35 to 65, with a difference of -0.024. Furthermore, right-leaning respondents tend to consume more RTL than center-leaning respondents.

The discrepancy between genders amounts to approximately 28.5% of RTL's total attention share in 2022, suggesting that females may be more susceptible to the impact of the ownership change at RTL than males.

Summarizing, this analysis reveals potential differences in media mergers' impact on attention shares across demographics. TMG's acquisition by Mediahuis highlights differences based on political leaning and age, while Sanoma's acquisition by DPG Media shows minimal variations except among high-income respondents. Conversely, RTL's acquisition by DPG uncovers substantial differences across gender, age, and political leaning, emphasizing the

need to consider diverse demographics when assessing the potential effect of media mergers on different subgroups of the general population.

Acquisition Sanoma by DPG Media

Objective

The objective of this analysis is to estimate the impact of the Sanoma takeover by DPG Media on the political leanings and trust in news of Sanoma consumers. The Sanoma case is particularly significant as it represents the largest media takeover of the last decade. Additionally, it offers extensive pre- and post-treatment periods, making it an ideal subject for assessing the potential impacts of such a major consolidation on media plurality and consumer behavior.

This analysis is motivated by the theoretical framework presented by Prat (2018), which suggests that media consolidation and loss of media plurality may lead to increased risk of media capture. If this risk were to materialize, consumers of biased news outlets can be expected to display changing positions in their political leaning and trust in news.

Prat (2018) states that increased consolidation raises the risk of conglomerates influencing the content and direction of news, potentially leading to biased reporting and loss of editorial independence. In 2020, the year prior to the merger, consumers of DPG Media had an average political leaning of 3.89, while consumers of Nu.nl had an average political leaning of 3.93. Given these pre-merger political leanings, it is expected that consumers exposed to media outlets under the control of the conglomerate will shift towards the political preferences endorsed by the conglomerate. Therefore, the first hypothesis regarding the anticipated effects of media consolidation on political leaning is that there will be a rightward shift in the political leaning of Sanoma consumers.

The second hypothesis, concerning trust in news following the acquisition of Sanoma by DPG Media, is more nuanced. The increased media power of the acquiring conglomerate may change media biases and editorial choices in news reporting post-acquisition, as predicted by Prat (2018). These changes might not align with the preferences of the existing audience

of the acquired brand. For the non-naive consumers, this could lead to a decrease in trust in news as they become more sensitive to the shifts in bias and potential misalignment with their expectations. However, there could also be significant potential benefits stemming from synergies and efficiencies resulting from the merger. Improved operational efficiencies and resource sharing could enhance the quality of the news, leading to increased trust among consumers. Additionally, an increase in brand awareness could further boost the credibility and perceived reliability of the news.

Empirical strategy

To accomplish the objective of estimating the impact of the Sanoma takeover on political leaning and trust in news, a control representing the outcome variables for the acquired media outlet in the absence of the takeover is needed. Due to the absence of a natural control group (as post-takeover observations without the takeover are unavailable), the synthetic control method and the synthetic difference-in-differences approach are employed. The synthetic control method creates a control group by forming a weighted average of other media outlets. This approach ensures that both the dependent variable and the background characteristics of consumers from these control outlets closely resemble those of Sanoma.

Respondents from these control media outlets are strictly not consumers of the acquired media outlet, ensuring a clear distinction between the treatment and control groups. This separation guarantees that the synthetic control group is independent of the direct effects of the takeover, representing the desired counterfactual scenario.

Weights are assigned to the control media outlets to minimize the pre-takeover performance difference between the synthetic control and the acquired media outlet. Constraints include non-negative weights that sum to one. Most media outlets receive near-zero weights, with only a few outlets receiving substantial weights for each outcome variable. Beyond matching pre-takeover performance, it is ensured that the selected media outlets exhibit similar background characteristics (income, age, gender) of their users. This matching is achieved using the *Synth* package in R, which aligns both background characteristics and the dependent variable to ensure a good fit for the treated media outlet in the pre-treatment period.

Data

The analysis utilizes pseudo-panel data, which comprises aggregated repeated cross-sectional data at the media outlet level spanning from 2016 to 2023. It examines two dependent variables: firstly, the average political leaning of the consumers of a media outlet, measured on a scale from 1 (left-leaning) to 7 (right-leaning); secondly, the trust in news among consumers, assessed on a scale from 1 (lack of trust in most news) to 5 (high level of trust in most news). The dataset encompasses 25 potential control media companies within the pseudo-panel dataset.

A notable limitation of the aggregation into the pseudo dataset is that a small portion of the aggregated news outlets consist of a small number of observations. However, in the computation of the weights, most of the weight is attributed to sources that have at least 50 observations.

Synthetic Difference-in-differences (SDID)

The unit weights derived from the synthetic control group using the *Synth* package are utilized to implement a difference-in-differences estimation. The primary parameter of interest is the interaction term for the post-treatment period and the treated dummy variable, which yields the Synthetic Difference-in-Differences (SDID) estimate for the Average Treatment Effect (ATT).

The reliability of estimated treatment effects using the Synthetic Difference-in-Differences (SDID) method can be compromised by small sample sizes, leading to increased variability in estimates. Additionally, standard errors may fail to adequately capture this variability, potentially resulting in inaccurate conclusions regarding statistical significance. To address these challenges and establish robust confidence intervals around the SDID estimate, this study adopts a bootstrapping approach inspired by the placebo test proposed by Arkhangelsky et al. (2021).

Given the limited time periods available in the dataset and the constrained number of control units, the efficacy of matching on pre-treatment characteristics could be significantly influenced during bootstrapping on the aggregated dataset. Therefore, the methodology

employed here involves iteratively sampling from the underlying non-aggregated dataset with replacement, thereby generating an empirical distribution of the SDID estimator. Each iteration of bootstrapping entails the computation of a distinct aggregated pseudo-panel dataset, resulting in varying weights for the synthetic controls and, consequently, fluctuating difference-in-differences estimates. This iterative process yields a distribution of estimates, thereby enhancing the robustness of confidence interval estimation.

This methodology helps to understand the variability in the SDID estimator, providing more robust standard errors and confidence intervals. Consequently, more resilient estimates are derived, which offers a closer approximation of the true sampling distribution of our estimator caused by the small sample size.

By combining the synthetic control method with difference-in-differences and enhancing inference through bootstrapping, the aim is to produce robust and reliable estimates of the impact of media takeovers on political leaning and trust in news. This comprehensive empirical strategy ensures that the findings are both methodologically sound and statistically robust.

Assumptions

SDID assumes that a weighted combination of control units can provide a good counterfactual for the treated unit. In this study the assumption is that the set of control media outlets is sufficiently similar to the treated outlet in terms of demographics, pre-takeover political leaning, and trust levels. Additionally, the takeover of one media outlet should not directly influence the political leaning and trust of consumers of other media brands. Thus, this study assumes that control media outlets do not change their news reporting post-treatment. Lastly, external factors influencing political leaning and trust, like major political events and changes in overall media regulation are assumed to remain relatively stable over the study period and affect both the treated and control group equally.

Results Acquisition Sanoma by DPG Media

Political Leaning

Applying the algorithm to generate a synthetic control yields a composition consisting of 74.9% RTL, 8.5% BuzzFeed, 3% Reformatorisch Dagblad, and 2% Telegraaf. The remaining portion, which sums up to complete the 100% composition, is allocated among other sources. Table 5 displays the pre-treatment values of the indicator variables for both Sanoma and its synthetic counterpart.

Table 5: Matching of Political Leaning and Background Characteristics

	Political Leaning	Income Median	Age Mean	Gender Mean
Sanoma	3.94	8.0	46.7	1.45
Synthetic Sanoma	3.94	7.3	46.8	1.44

Note: Table shows the values of indicator variables and the average pre-takeover outcome variable for the actual and synthetic Sanoma. Political leaning is an average over the pre-takeover period, 2016-2020. Income median is measured as 17 income brackets. Gender is measured as a dummy variable which is 1 for male, 2 for female.

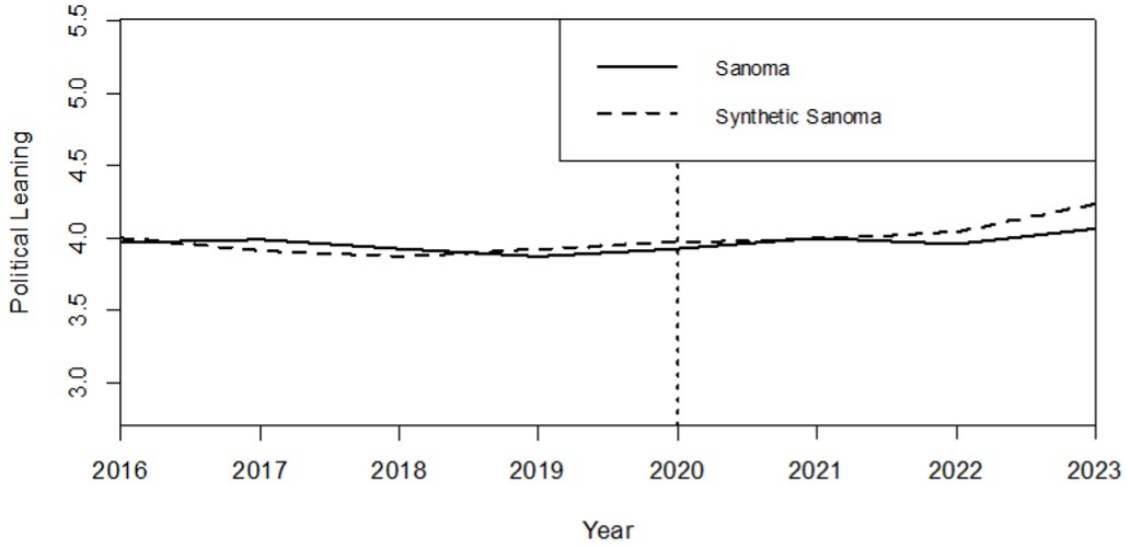
The average political leaning in Sanoma and its synthetic equivalent are nearly identical, as are the distributions for age and gender. One noteworthy distinction is that the median income for Sanoma is higher than that of its synthetic control.

Naively comparing the means of the political leaning variable before and after the merger, the mean political leaning up until the treatment in 2020 is 3.94, and the average political leaning after the treatment is 4.01. This shift indicates a slight movement towards a more right-leaning stance compared to the pre-treatment period.

Main result In the subsequent analysis, the synthetic control serves as the representation of “business as usual” for Sanoma, allowing us to examine whether outcomes after the takeover deviate from this counterfactual benchmark.

Figure 7 illustrates both actual and synthetic Sanoma over the pre-takeover period used to construct the control, as well as the post-takeover period where the control serves as our counterfactual. The synthetic Sanoma consumers track the Sanoma consumers closely across the pre-treatment periods. However, following the treatment intake in, a slight discrepancy

Figure 7: Political leaning of Sanoma vs Synthetic Sanoma



emerges, with Sanoma displaying a slightly more left-leaning estimate than its synthetic counterpart from 2022 onwards. Specifically, in 2022, the synthetic counterpart records a political leaning of 4.05, while Sanoma stands at 3.96. In 2023, these figures are 4.22 and 4.07 respectively. The observed difference in 2023 is approximately 0.15, indicating a more left-leaning stance among Sanoma consumers, with the difference being approximately 4% compared to its synthetic counterpart.

Synthetic Difference-in-differences Using the unit weights derived from the synthetic control method, a weighted difference-in-differences model is employed to assess the impact of the Sanoma takeover by DPG Media on the political leaning of Sanoma consumers. The coefficient for the interaction term `-after_treatment:treated-` is estimated at -0.082 (Table 6). This estimate suggests that following the takeover, Sanoma's consumers exhibited a slight shift towards a more left-leaning stance compared to the control group.

Given the likelihood of unreliable standard errors due to the small sample size, the bootstrapping method is employed to establish a confidence interval of estimates (Figure 8). The resulting 95% confidence interval for the bootstrapped difference-in-differences estimates spans from (-0.2128 to 0.1543). Since this interval encompasses zero, there is no evidence to conclude that the takeover did not have a significant impact on the political leanings of

Table 6: Synthetic Difference-in-Differences Political Leaning

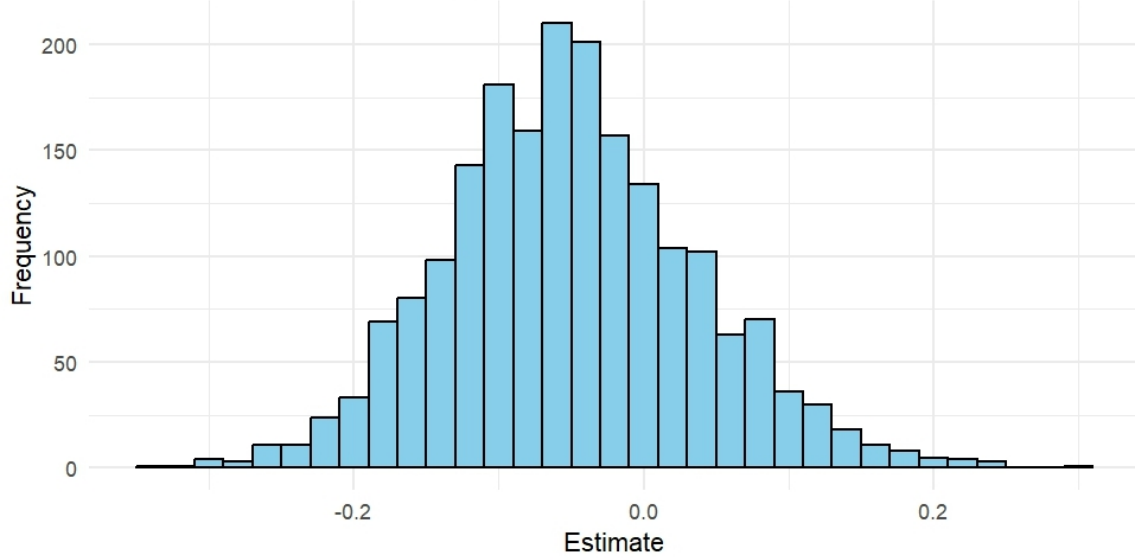
	<i>Dependent variable:</i>
	political_leaning_mean
after_treatment	0.152*** (0.033)
treated	0.0002 (0.045)
after_treatment:treated	-0.082 (0.073)
Constant	3.939*** (0.020)
Observations	208
R ²	0.103
Adjusted R ²	0.090
Residual Std. Error	0.045 (df = 204)
F Statistic	7.824*** (df = 3; 204)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Sanoma's consumers.

Long-run changes in media exposure are more likely to produce measurable effects, as normally there is only a limited short-term weight of new information relative to pre-existing information that has the potential to influence consumer behavior (Strömberg, 2015). Thus, it is possible that the treatment effect can vary with the length of time since treatment. To examine the dynamic nature of treatment effect, a centered time variable is included in the analysis to test for the possibility of dynamic treatment effects. The results do not indicate that the treatment effect changes with time since treatment. Appendix F shows the results of the bootstrapped difference-in-differences estimations for the interaction between the treatment variable and the centered time variable.

The findings do not support the hypothesis based on the theory of Prat (2018) that media mergers lead to a right-leaning shift in political leaning. One possible explanation could be that the proportion of naive consumers who are influenced by biased news is insufficient to

Figure 8: Bootstrap Results Political Leaning



Note: 2000 bootstrapped samples, 95% confidence interval ranges from (-0.2128 to 0.1543)

produce statistically significant changes. Furthermore, the initial political leanings of DPG Media and Sanoma may not have been sufficiently different to observe noticeable shifts in political preferences.

Trust in News

Because the synthetic control weights are calculated based on both the dependent variable as well as the predictors, a new synthetic control group is generated in the analysis regarding trust in news. The resulting synthetic control group comprises 71.4% RTL, 18.6% MSN News, 8.9% NOS, and 0.3% Volkskrant, with the remaining 0.8% allocated to other sources. Table 7 delineates the pre-treatment values of the indicator variables for Sanoma and its synthetic counterpart.

The average trust in news is comparable between Sanoma and its synthetic counterpart, as are gender and political leaning. However, a notable distinction is observed in the matched predictors, with the median income for Sanoma being higher compared to its synthetic control.

When comparing the naïve estimator of difference in mean trust in news before and after the merger in the Sanoma group, the results indicate that the mean trust in news before the

Table 7: Matching of Trust in News and Background Characteristics

	Trust Mean	Income Median	Age Mean	Gender Mean
Sanoma	3.49	8.00	46.7	1.45
Synthetic Sanoma	3.49	7.15	49.5	1.44

Note: Table shows the values of indicator variables and the average pre-takeover outcome variable for the actual and synthetic Sanoma. Trust in News is an average over the pre-takeover period, 2016-2020, and is measured on 7-point scale. Income median is measured as 17* income brackets. Gender is measured as a dummy variable which is 1 for male, 2 for female.

treatment in 2020 is 3.49 compared to 3.61 post-merger. This suggests a slight improvement in trust in news among Sanoma consumers following the takeover.

Figure 9: Trust in News of Sanoma vs Synthetic Sanoma

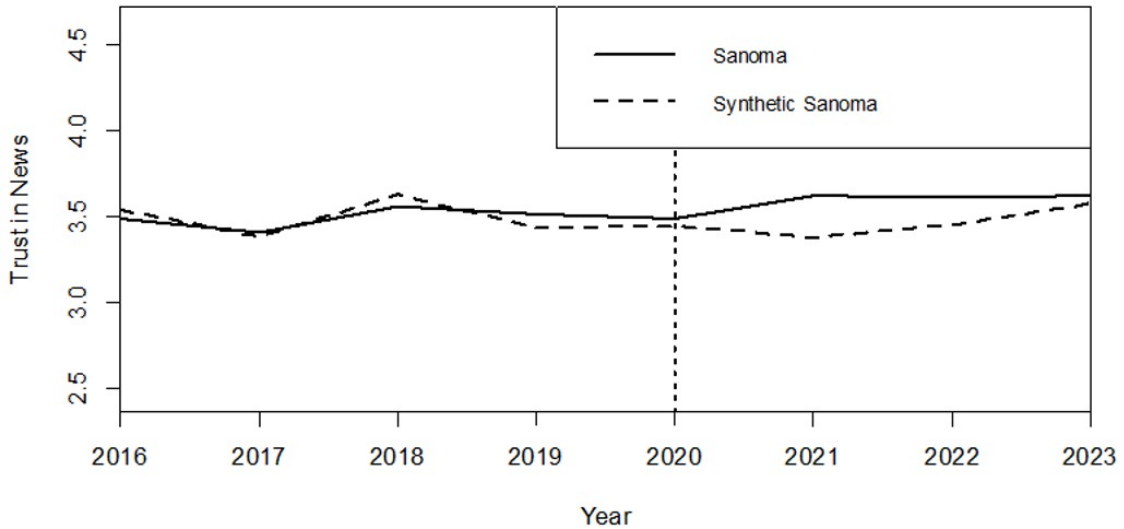


Figure 9 depicts both actual and synthetic Sanoma groups across the pre-takeover and post-takeover periods used in constructing the control. Following the treatment intake in 2020, a slight deviation emerges, with Sanoma consumers exhibiting greater trust in news than its synthetic counterpart. Specifically, in 2022, the synthetic counterpart records a trust in news value of 3.45, while Sanoma stands at 3.61. By 2023, these figures are 3.58 and 3.62, respectively. This disparity seems to be attributed to both a decrease in trust in news among non-Sanoma consumers after the merger and a slight increase in trust in news among Sanoma consumers.

Synthetic Difference-in-differences

Using the unit weights estimated through the synthetic control method, the weighted difference-in-differences model is employed to evaluate the impact of the Sanoma takeover by DPG Media on the trust in news of Sanoma consumers.

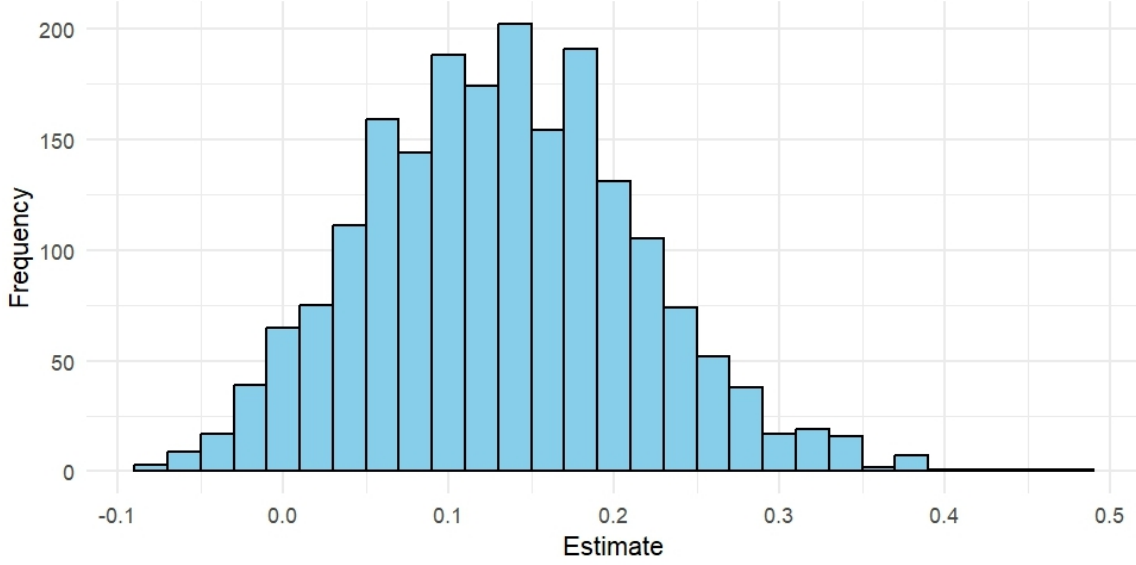
Table 8: Synthetic Difference-in-Differences Trust in News

	<i>Dependent variable:</i>
	trust_mean
after_treatment	-0.017 (0.017)
treated	0.004 (0.023)
after_treatment:treated	0.142*** (0.038)
Constant	3.490*** (0.010)
Observations	208
R ²	0.108
Adjusted R ²	0.095
Residual Std. Error	0.023 (df = 204)
F Statistic	8.254*** (df = 3; 204)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

The coefficient for the interaction term is estimated at 0.14. This estimate suggests that following the takeover, Sanoma’s consumers exhibited a slight increase in trust in news compared to the control group.

The resulting 95% confidence interval for the bootstrapped difference-in-differences estimates spans from -0.0189 to 0.2228 Figure 10. Although this range encompasses zero, the result is still significant at a 10% significance level, suggesting a potential positive shift in the trust in news among Sanoma’s consumers due to the takeover. In alignment with the analysis on changes in political leaning, an examination of the dynamic treatment effect of

Figure 10: Bootstrap Results Trust in News



Note: 2000 bootstrapped samples, 95% confidence interval ranges from (-0.0189, 0.222)

the takeover was conducted. The bootstrapped estimates reveal a significant negative coefficient associated with the treatment effect over time (Appendix G). This finding suggests that while the initial rise in trust in news among Sanoma’s consumers post-takeover was evident, there appears to be a reversion towards the synthetic control group as time progresses.

The increase in trust in news among Sanoma consumers following the takeover by DPG Media suggests a potential shift in consumer perception and engagement with news content. This aligns with the hypothesis that potential benefits from synergies and efficiencies resulting from consolidation could improve the quality and credibility of news. However, a study into the changes in treatment effect over time indicates that the initial increase in trust relative to the synthetic control group diminishes as time progresses. The findings do not support the hypothesis based on Prat (2018) that changes in media biases following a merger negatively influence trust levels among consumers. This suggests that while there may be shifts in editorial choices following mergers, their impact on consumer trust in news appears to be smaller compared to the positive effect on trust due to potential improvements in news quality.

In both the analysis regarding political leaning and trust in news, RTL is found to be a large contributor to the synthetic control group of Sanoma. From this follows that the

CONCLUSION

consumers of RTL behave relatively similar to consumers of Sanoma compared to other media outlet consumers. This similarity in consumer behavior between RTL and Sanoma audiences implies that DPG Media caters to a relatively homogeneous consumer group from 2024 onwards. This could lead to a situation in which DPG Media is supplying a relatively similar consumer base with news if the acquisition of RTL is approved, which might lead to a lack of diversity in perspectives and opinions for a particular consumer base.

Conclusion

This analysis of news consumption highlights several key lessons and concerns regarding changes in Dutch media plurality and its implications.

First, media plurality has declined from 2016 to 2023 when considering common ownership. With the anticipated acquisition of RTL by DPG Media, the top three media conglomerates are projected to cover more than 70% of consumers' attention share in 2024. These changes in media plurality can almost fully be explained by mergers during the study period. This finding indicates an increase in the potential ability of conglomerates to influence the direction of the news, as suggested by Prat (2018).

Second, despite no significant shift in the political leanings of Sanoma consumers post-takeover, the findings suggest an increase in consumer trust in news following the change in media ownership. This indicates a potential shift in consumer perception and engagement with news content following the takeover. However, an investigation into the dynamic effect of the takeover on trust over time shows that this effect is likely to decline, underscoring the importance of continued monitoring and analysis of consumer attitudes towards media in the event of mergers in the media industry. The findings do not support the hypothesis based on the theory of Prat (2018) that media mergers lead to changes in political leaning. One potential explanation is that the share of naive consumers susceptible to biased news is not large enough to show significant deviations. Additionally, the estimated increase in trust in news among Sanoma consumers does not support the derived hypothesis from Prat's theory that changes in media biases following a merger negatively influence trust levels among consumers. This suggests that while there may be shifts in editorial choices

CONCLUSION

following mergers, their impact on consumer trust in news appears to be smaller compared to the positive effect on trust due to potential improvements in news quality.

The decreasing trend in media plurality in the Netherlands raises significant concerns about the regulation of news providers. Regulatory and supervisory bodies, such as the Authority for Consumers & Markets (ACM) and the Dutch Media Authority, should further investigate the impacts of increased media consolidation on media plurality, focusing particularly on the loss of news diversity and the rise in news recycling, as highlighted in Belgium by Hendrickx and Ranaivoson (2021). Additionally, the relationship between media plurality and democratic outcomes requires further exploration. Implementing a plurality test in merger assessment in the media industry could help maintain the diversity of information sources. Such a test would evaluate the potential impact of mergers on the diversity of viewpoints available to the public. This is particularly relevant for the potential takeover of RTL by DPG Media, as audiences of RTL and DPG Media display similar consumer behavior, evidenced by the fact that RTL encompassed a large part of the synthetic control group for Sanoma in the analysis.

Lastly, an important lesson from this analysis is the inadequacy of existing data on news consumption. While the Reuters Digital News Report dataset provides useful data for a person-centric analysis of news consumption in the Netherlands, it has several limitations extensively discussed in this paper. Future research would greatly benefit from more fine-grained data collection, a role that the Dutch Media Authority could play. Specifically, future studies should incorporate detailed measures of the time individuals spend on each news source. This would allow for a more accurate assessment of how media consumption habits change post-merger and offer deeper insights into the extent of media influence on consumer behavior.

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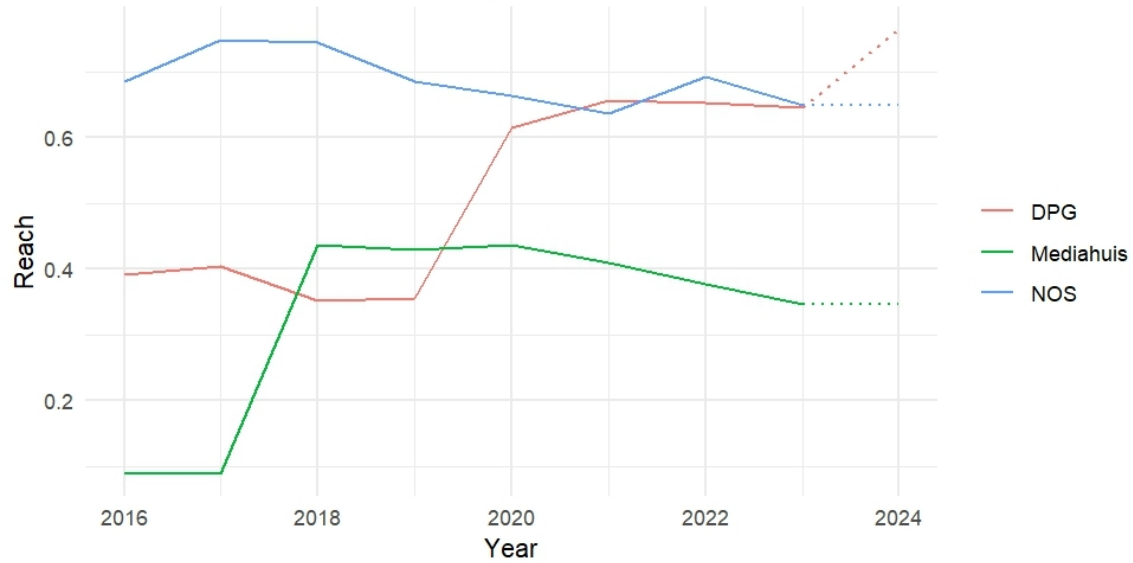
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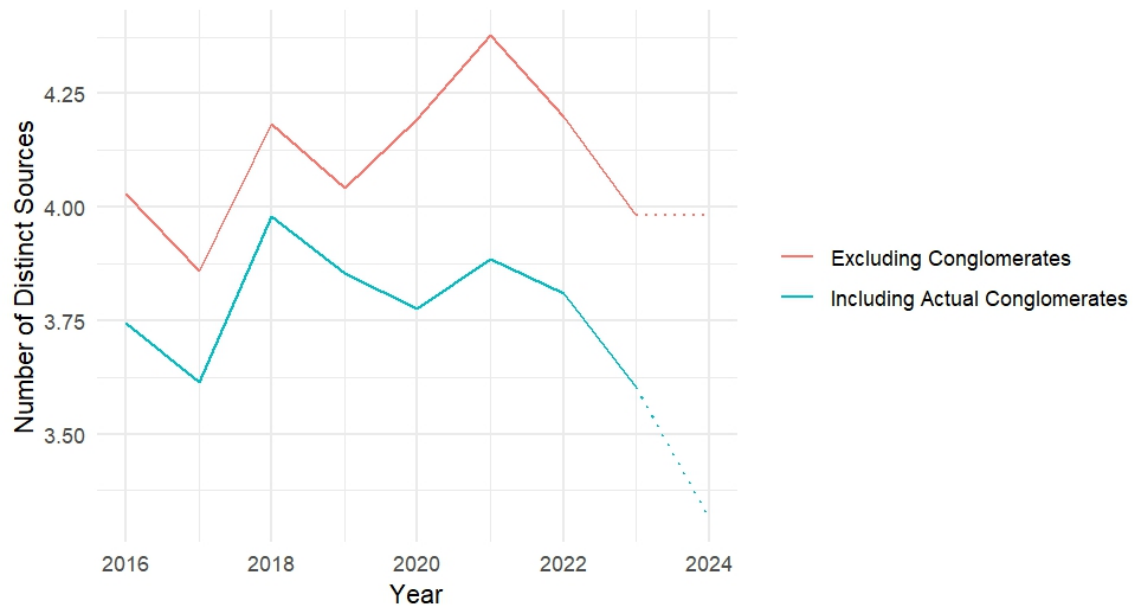
Appendix A

Figure 11: Trend of Reach



Appendix B

Figure 12: Distinct Number of Sources Excluding and Including Common Ownership



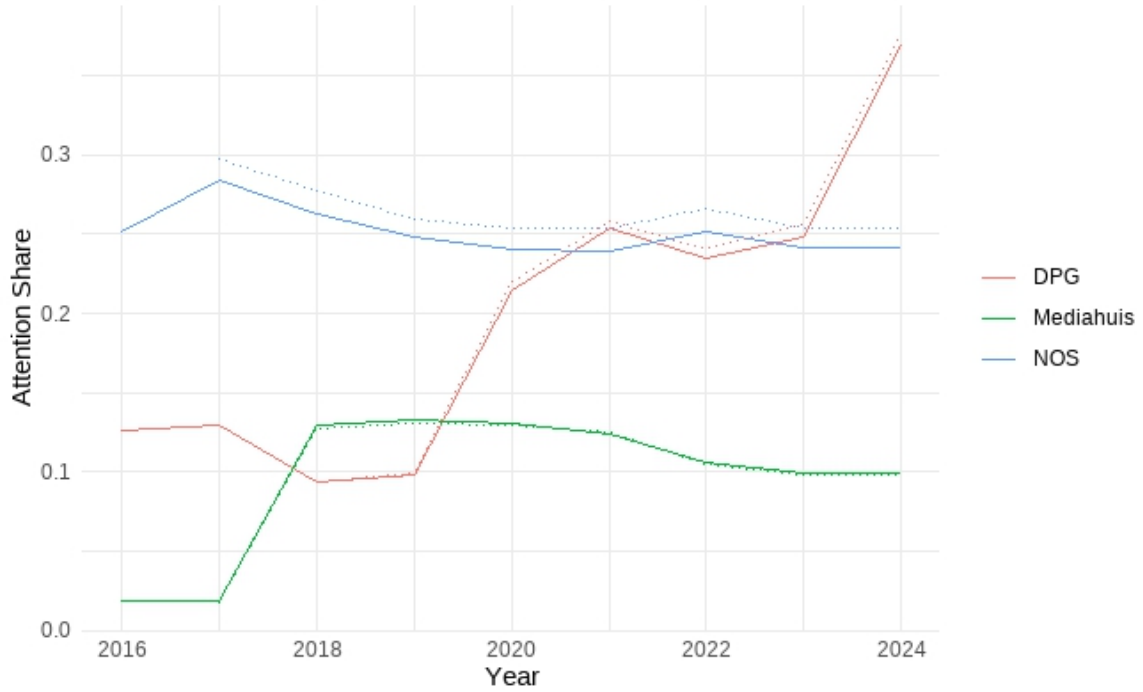
Appendix C

Table 9: Required Percentage of Naive Consumers to Swing Vote Share

	1% vote swing (2016)	2% vote swing (2016)	5% vote swing (2016)	1% vote swing (2024)	2% vote swing (2024)	5% vote swing (2024)
DPG	0.155	0.305	0.72	0.053	0.104	0.246
Mediahuis	>1	>1	>1	0.199	0.390	0.920
NOS	0.078	0.153	0.36	0.081	0.159	0.376

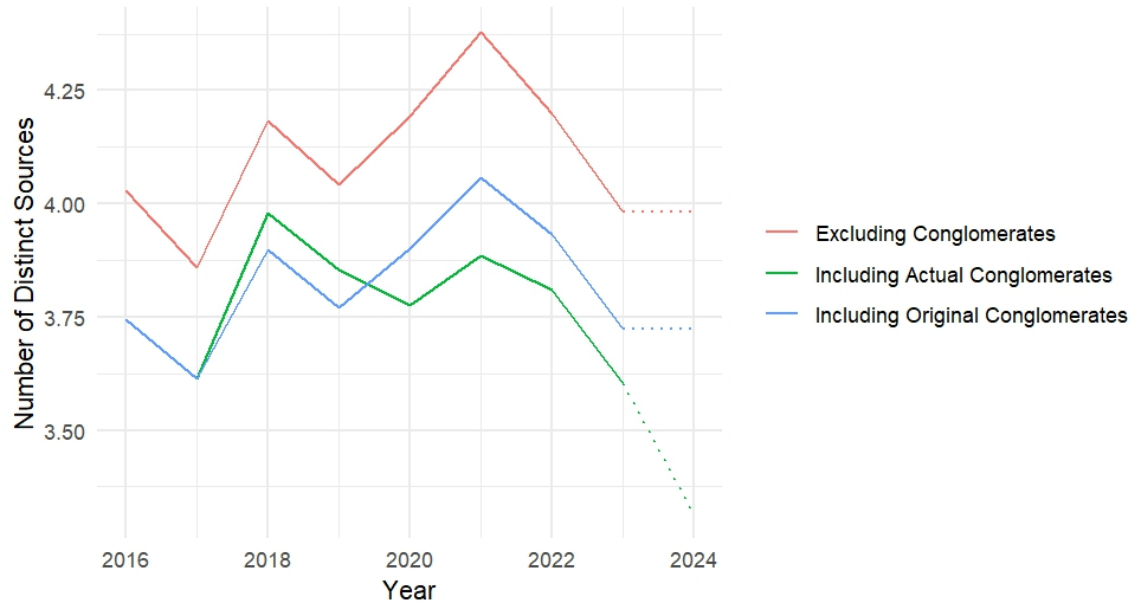
Appendix D

Figure 13: Extension Top 3 Attention Shares Media Conglomerates



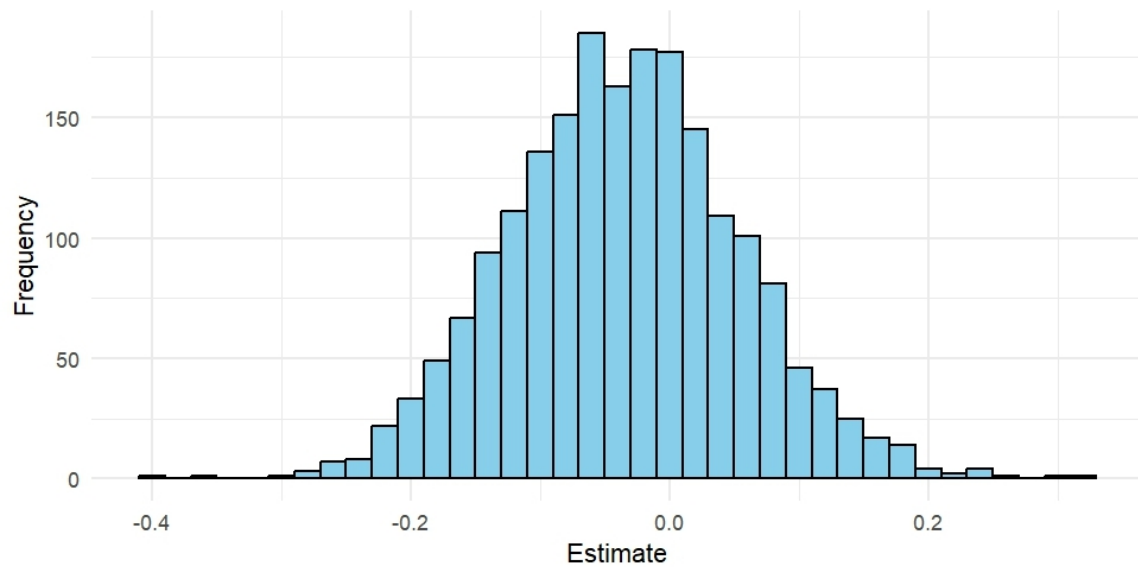
Appendix E

Figure 14: Distinct Number of Sources Excluding and Including Common Ownership



Appendix F

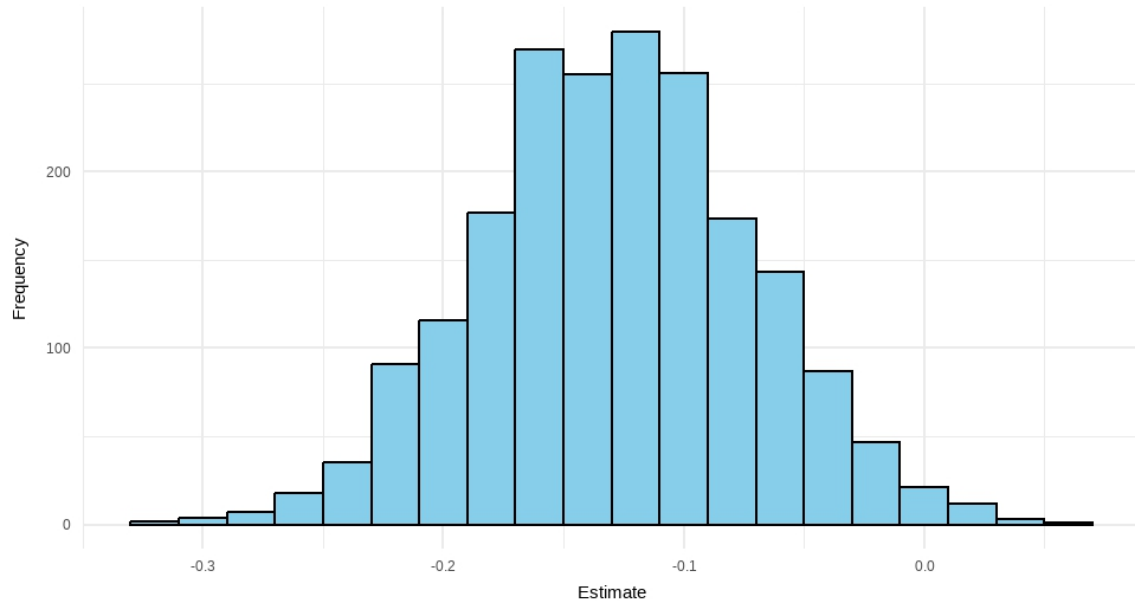
Figure 15: Bootstrap Results Dynamic Effect Political Leaning



Note: 2000 bootstrapped samples, 95% confidence interval (-0.2128, 0.1543)

Appendix G

Figure 16: Bootstrap Results Dynamic Effect Trust in News



Note: 2000 bootstrapped samples, 95% confidence interval (-0.2204, -0.0644)