



GÖTEBORGS  
UNIVERSITET

DEPARTMENT OF POLITICAL SCIENCE

# IS THE MEDIA DIVIDING US?

A Panel Data Analysis on the Relationship Between  
Media Fragmentation and Mass Polarization in 71  
Democracies (2000-2018)

**Samuel Larsson**

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Master's Thesis:	30 credits
Programme:	Master's Programme in International Administration and Global Governance
Date:	2022-05-20
Supervisor:	Mattias Agerberg
Words:	14447

## Abstract

*Mass polarization as a phenomenon that divides the electorate on political and societal issues is on the rise globally, and its negative consequences for the well-being of a polity are well documented. Literature on the drivers of these upward trends frequently blame income inequality and immigration for polarizing the masses. However, recently another theory has gained prominence in the discourse as a challenger to these notions, relating to the splintering of audiences and information outlets in the media landscape – i.e., media fragmentation. Media fragmentation and the contemporary high-choice media environment is here said to polarize the masses by capturing consumers into partisan echo-chambers in which they only hear one-sided arguments that solidify their pre-existing beliefs. While there are several studies that support this narrative, they are almost exclusively set in the U.S. Thus, we know little about the generalizability of these results. Is there a general relationship between media fragmentation and mass polarization? Or is this relationship contingent on certain institutional and economic contexts? This study sets out to answer these questions by applying a panel data analysis covering 71 democracies over a 19-year period (2000-2018) (n=1349), using data from the Varieties of Democracies Institute (V-Dem). Due to the great availability of data at my disposal, I am able to show through a set of fixed-effects models that (1); there is no general relationship between media fragmentation and mass polarization; (2) rather, this relationship is contingent on the electoral system of a country, as media fragmentation has a large and positive significant effect on mass polarization in majoritarian systems; (3) income inequality do play a role, but contrary to my expectation, only at the minimum level.*

**Key words:** *mass polarization, media fragmentation, electoral system, income inequality, panel data*

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## *Acknowledgements*

Firstly, I would like to express my gratitude towards my supervisor Mattias Agerberg for his support and consultation throughout the process of writing this paper. Secondly, I would like to thank Marina Nistotskaya and Georgios Xezonakis at the Department of Political Science for providing me with the knowledge in quantitative research design that made this study possible in the first place. Lastly, I would like to thank my fellow students at the IAGG-program for their support and valuable discussions throughout this semester. I could not have done this without any of you.

## 1.0 Introduction

Mass polarization – i.e., the process or state wherein voters and political parties are (or increasingly become) divided on political and societal issues – is on the rise in many countries globally and has been a persistent part of political life for a long time in some. From the U.S, Poland, and the U.K to Brazil, Thailand, and Kenya – signs of severe mass polarization are present both in developed and developing countries. In the U.S - where these effects are perhaps most well-known - every political institution is currently characterized by sharp party divisions, and the ideological divide between Democrats and Republicans in the House and Senate is at an all-time high (Abramowitz & Webster, 2016). Similar trends can also be observed in Europe where party politics in the light of the rise of populism never has been more polarized than it is now (Winkler, 2019; Bértoa & Rama, 2021). Trends in the U.S and several other OECD countries also suggest that *affective* polarization – i.e., the extent to which partisans dislike oppositional voters and parties - is on the rise (Boxell et.al, 2021). Furthermore, while polarization arguably has been a more longstanding and consistent part of many developing countries' and young democracies' political life, there are also here signs of new trajectories of intensified mass polarization in countries such as Brazil, Colombia, India, Indonesia and Kenya (Carothers & O'Donohue, 2019).

Polarization per se does not need to have negative outcomes for the democratic well-being of a polity. On the contrary, normal levels of programmatic polarization might have positive effects by for example “mobilizing political participation, simplifying the political choice for voters, and strengthening political parties” (McCoy, et.al, 2018:17). However, when at higher levels – (severe) mass polarization can have several well-documented negative outcomes for a country's democratic well-being: it may seriously harm the party-voter relationship and ‘discourage citizens from political participation (Bertoa & Rama, 2021); inspire tribalism politics where social group identity trumps policy issues, creating political instability and institutional gridlocks (Carothers & O'Donohue, 2019); and harm economic performance (Grechyna, 2016). What is more problematic is that when mass polarization becomes severe, it tends to spill over from political life into social life, creating animosity between groups in society belonging to different political camps (Mcoy et.al, 2018). Understanding what factors that intensify or mitigate mass polarization in a polity is thus critical to protect its democratic and social well-being.

While much previous literature has pointed to income inequality and immigration as the main explanatory factors for the rising trends in mass polarization (McCarty et.al, 2006; Grechyna, 2016; Winkler, 2017), in recent years another theory has become popularized in the discourse as an alternative explanation to this notion - i.e. the rise of digital media and the fragmentation of the media landscape (Stroud, 2010; Mancini, 2013; Sunstein, 2018; Benedictis-Kessner et.al, 2020;). Media fragmentation - i.e., the splintering of audiences and information outlets in the media landscape – is here said to contribute to the rising polarization among the electorate by intensifying partisan bias and creating echo chambers for consumers of media in which they only ascribe to like-minded sources of information. This is a process which is typified by the rise of private media in the U.S. (e.g., Fox News, CNN, alternative online media outlets, etc.), resulting in a high-choice media environment with a strong presence of partisan outlets. While the literature on the relationship between the media fragmentation and mass polarization is rich (see Kubin & Sikorski, 2021), a majority of these studies are situated in the U.S which leaves the generalizability of their results questionable. Indeed, so far, we know little about whether evidence from individual (often experimental) studies in the U.S. can be generalized to other countries and settings. Moreover, no studies have so far sought to test whether the polarizing effects of media fragmentation are contingent on any particular context.

*Is there a positive general relationship between media fragmentation and mass polarization? Or is this relationship contingent on certain contexts?* By testing the relationship between media fragmentation and mass polarization across 71 democracies over a 19-year period (n=1349), using data from the Varieties of Democracies Institute (V-Dem), this paper contributes to the literature on mass polarization and media fragmentation by addressing these questions. Due to the great available of data used here, I will not only be able to address the first research gap on the question of generalizability, but I will also be able to explore in what institutional and economic contexts media fragmentation has an effect on mass polarization. Based on previous literature, I will test whether the effect of media fragmentation on polarization is stronger in countries with majoritarian or proportional/mixed electoral systems and high levels of income inequality. By almost exclusively focusing on the US, previous research has not been able to consider this type of conditional effect since variables like “electoral system” in general are constant within a specific country. Thus, one of the main

advantages with this study is that it will be able to claim a high degree of generalizability, while also being able to nuance the relationship of interest to a greater extent.

Based on a set of fixed-effect panel data models, I find that media fragmentation has a positive significant effect on mass polarization in countries with majoritarian electoral systems. I find no support for a general relationship between the two, nor that higher income inequality plays any role. These results indicate that individual studies conducted in the U.S. on this relationship can be generalized only to other countries that share the same electoral system. This would indicate that it is the two-party political context that makes media fragmentation conducive to having polarizing effects in the U.S. (and beyond). In other words, the main takeaway from revealing these contextual effects is that media fragmentation per-se does not always intensify mass polarization in all given settings. As I will discuss in this paper, the answer seems to lie in how majoritarian systems incentivise elites to take on polarizing outward strategies, using the media as a platform to spread influence and shape opinion. The paper will be structured as follows. The subsequent section will provide an overview of the literature on mass polarization and media fragmentation so far and provide an in-depth presentation of the mechanism that connects media fragmentation and mass polarization along with my hypotheses; section 3 introduces the method and the data that will be used to test the hypotheses; section 4 will present the results from the panel data analysis; and the remaining part of the paper will discuss the findings and its implications in relation to previous research.

## **2.0 Media fragmentation & mass polarization: an overview**

The study of mass polarization has a rich tradition in the social sciences, particularly in the U.S where the electoral competition between the Democrats and the Republicans has since the early 1990s been a natural research environment to study its trends, levels, and consequences (Fiorina et.al, 2008). DiMaggio et.al (1996), in their seminal study on polarization among the American electorate, for example, found little evidence that social attitudes had been polarized in the past 20 years - quelling much of the general feeling at the time that a fierce culture war was dividing American society (DiMaggio et.al, 1996). Since then, much of the scholarly debate has been concentrated on the issue of whether mass polarization and the culture war in the U.S are exaggerated or not (see Fiorina et.al, 2006; Abramowitz & Saunders, 2008). Fiorina et.al, (2006) argued that while polarization among the elites had increased, it had not done so among



the masses. On the contrary, Abramowitz & Saunders (2008) however, showed that elite polarization had been coupled by an increased mass polarization. Currently, however, it would not be controversial to conclude that polarization, in fact, is something that is very real and present in contemporary American society, both in terms of issue-stance, identity and affection at the elite and mass level (Abramowitz et.al, 2016; Iyengar et.al, 2019; Boxell et.al, 2021).

On the question of what explains these rising trends in mass polarization in the U.S., the rise of digital media and media fragmentation has during the last decade become an increasingly popular narrative in the discourse. Why would media fragmentation drive mass polarization? Is there a credible causal mechanism underlying this relationship? It is not necessarily the case that an increase in media choices per se would induce polarization among consumers. One could perhaps even argue that with more choices and exposure to other opinions, the consumer would be able to reevaluate her own pre-existing's views by "hearing the other side" more often. However, the theory here is that the opposite effect is true – i.e., with more choices, consumers tend to self-select into channels or news sites that reinforce their pre-existing biases (Duca & Saving, 2017). Indeed, this narrative is driven by the view that the high-choice media environment of the contemporary era - where the proliferation of partisan news has become stronger - has led people to more frequently self-select into information feeds that confirm their pre-existing biases (i.e., selective exposure) (Kubin & Sikorski, 2021). The essence of this theory is exemplified by Sunstein (2017) in his book *#Republic* where he argues that "when options are so plentiful, many people will take the opportunity to listen only or mostly to those points of view that they find most agreeable...[and] there is a natural human tendency to make choices with respect to entertainment and news that do not disturb our pre-existing view of the world" (Sunstein, 2017:75). Moreover, Bail, et.al (2017) for example finds that "exposure to opposing views on social media can increase political polarization" rather than reduce it (Bail et.al, 2017: 1).

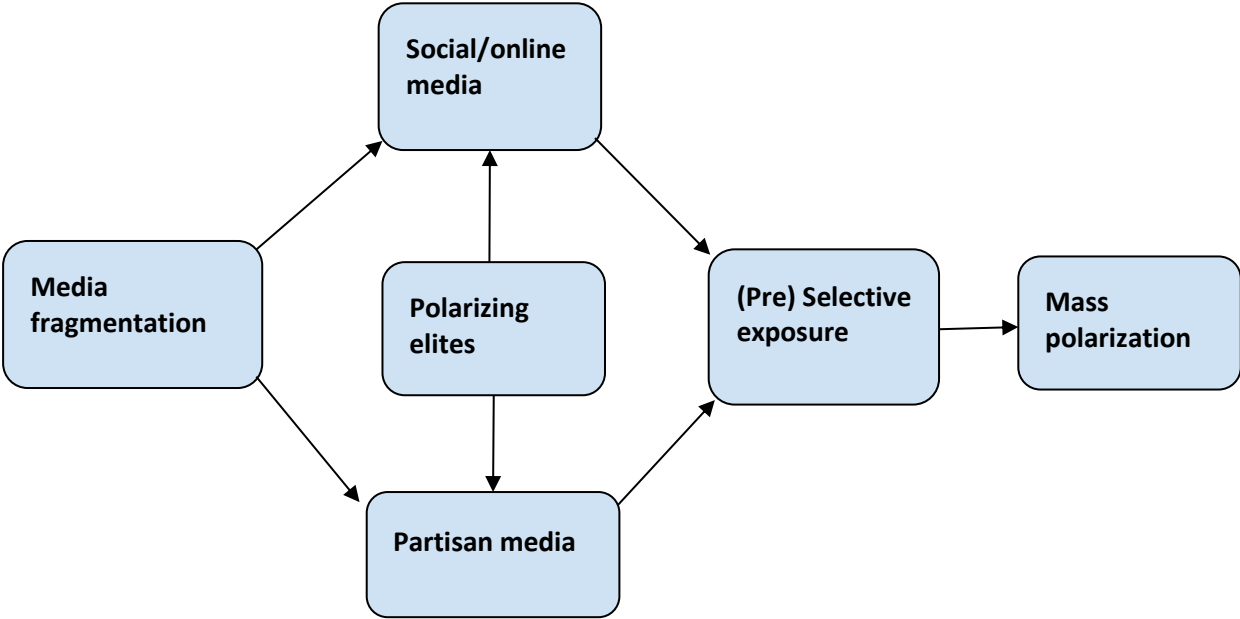
There are several ways in which the media can contribute to mass polarization in today's high-choice environment. Compared to how information networks and news operated in the previous era some two decades ago - where the bias was "toward neutrality and inoffensiveness to capture the largest audience share" - there is now as Wilson (2020:225) states a bias "towards standing out amongst a sea of options" (Wilson, 2020:225). In this high-choice media environment, there has in turn been an increased presence of partisan media which captures

partisan segments of the population and locks them into an “echo chamber” (Levendusky, 2013). Partisan media is distinct from non-partisan media in the sense that it is opinionated and skewed towards a particular political viewpoint or party (Levendusky, 2013). Moreover, as Stroud (2010) states, the media is here “the primary way in which elite opinions are transmitted to the public” (Stroud, 2010:557). In turn, this becomes a channel for a polarized elite to affect the attitudes of the masses in a polarizing manner.

Furthermore, the polarizing effect of partisan media is here said to take place either in the form of *selective exposure* (the choice made by the viewer) or *pre-selective exposure* (unintentional exposure in the form of algorithms, interpersonal networks, etc) (Kubin & Sikorski, 2021:194). In terms of selective exposure to partisan media - i.e., people who intentionally choose to watch media that confirm their pre-existing views - the main polarizing mechanism here is that by hearing persuasive arguments that confirm one's pre-existing biases, people of one side “develop polarized attitudes that follow the given norms of that group” (Stroud, 2010:558). As Sunstein (2017) moreover argues, the role of ‘persuasive arguments and information’ is central to how partisan media and social media instigate group polarization. Discussions within these groups are often skewed and biased towards a certain direction which will limit the ‘argument pool’ and “move people further in the direction of their initial inclinations” which often leads to extreme attitudes (Sunstein, 2017:82). Besides the persuasive mechanism, Sunstein (2017) further argues that there are ‘reputational’ and ‘confidence’-based mechanisms underlying this polarization process. The latter points to the notion that people will adjust their arguments in accordance with the group to gain a favourable reputation within the group. The former suggests that the more convinced you become that your views are the right ones, and the more people in the group agree with your views, the more confident you will get and as a result more extreme (Sunstein, 2017).

However, this polarizing effect tends to be stronger among people who are already extreme in their ideological positioning (see Levendusky, 2013), and those who have a great deal of interest in news and politics (see Davis & Dunaway, 2016). Moreover, the share of people who directly consumes partisan media in the American public merely amounts to around 10 to 15 percent (Prior, 2013:9). Nonetheless, while the radicals might be the ones who are most susceptible to the polarizing effects of this type of media, there are other indirect ways in which

non-extremists may become influenced. Indeed, as Druckman et.al (2018) finds, through pre-selective exposure groups might attain polarizing attitudes through a ‘two-step communication flow’, where those who watch partisan media influence non-watchers in their interpersonal network (Druckman et.al, 2018).



**Figure 1.** A simplified illustration of the mechanisms that underly the relationship between media fragmentation and mass polarization. Source: Larsson (2022)

Furthermore, in the contemporary media landscape where social media has become a popular platform to consume news and information, individuals have become increasingly sensitive to being exposed to fake news and disinformation that spread misconceptions of political opponents and the “real world” (Wilson et.al, 2020). People that spend a lot of time online and on social media also tend to be increasingly exposed to polarizing content in their online feed (Iyengar et.al, 2019). The real-world consequences of this are that individuals may become increasingly convinced of their own biases and that their side holds the real truth, regardless of what factual information might be presented. Consequently, individuals might become reluctant to compromise on issues and will instead develop a negative view of the other side, which minimizes the possibility to reach common ground on political and societal issues, ultimately polarizing society (Benedictis-Kessner, 2020).

Other than the theoretical expectations developed above, what does the empirical evidence tell us? In the U.S., where this narrative has its stronghold, there is mixed empirical support. Duca

& Saving (2016) for example find that periods of rising media fragmentation have played a greater role in driving political polarization than income inequality (Duca & Saving, 2016). Several experimental and cross-sectional studies have also shown that selective exposure to partisan media is associated with higher attitudinal polarization (Stroud, 2010; Levendusky, 2013; Kim, 2015) as well as higher affective polarization (Lau et.al, 2017). Other scholars have found that mere access to broadband internet increases both partisan hostility and consumption of partisan media (Lelkes et.al, 2017). However, others have found little evidence in favour of these conclusions. Boxell et.al (2017) finds that contrary to previous assertions, polarization has increased among demographic groups that are the ones “least likely to use the internet and social media” rather than among those who use it (Boxell et.al, 2017:1). Similarly, Gentzkow & Shapiro (2011) provides that, contrary to the general belief, there is no evidence that the internet and online news consumption is becoming more ideologically segregated (Gentzkow & Shapiro, 2011). Regarding partisan media, Prior (2013) moreover find no conclusive evidence that partisan media is making the average American more polarized - except for a small group of the most politically involved and influential people (Prior, 2013). In other words, while the empirical evidence is rather mixed, claims that media fragmentation is driving mass polarization are not in any sense baseless.

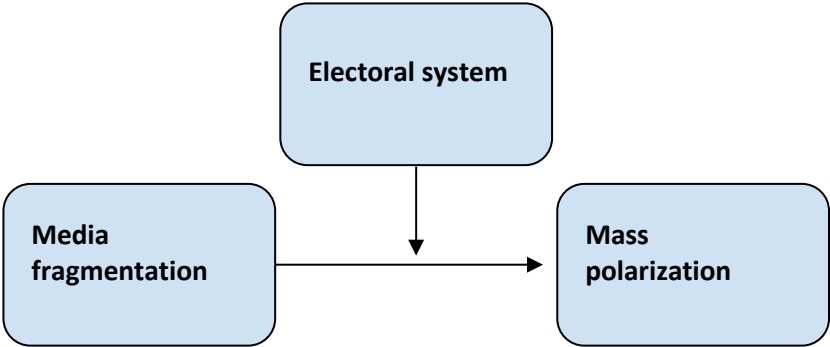
To what extent are the results which support the narrative of interest then generalizable to other countries and settings outside the U.S.? The literature on the relationship between media fragmentation and mass polarization outside the U.S. is much sparser, and the few studies that have sought to test this relationship cross-nationally have not found any evidence that supports this narrative (see Boxell et.al, 2021). Indeed, as Kubin & Sikorski (2021) provides in their systematic review of the literature on media and polarization, there is an overwhelming focus on the U.S. in this literature (81 out of 94 articles in their sample). The minority of studies conducted outside the U.S. were either done in South Korea (see Kim, 2015) or in Western Europe (see Bos et.al, 2016) (Kubin & Sikorski, 2021). Thus, there is arguably a research gap to be filled here in terms of revealing the generalizability of the studies that have so far mostly been made in a North American context. Is there a relationship between levels of media fragmentation and mass polarization globally over time? Are there any institutional or economic contexts in which media fragmentation has a bigger polarizing effect? This study aims to answer these questions by applying a panel data analysis covering 71 democracies over

a 19-year period (n=1349). Due to the great availability of data utilized here, I will be able to not only test the generalizability of previous studies but also test whether there are certain institutional (i.e., electoral system) and economic contexts (i.e., income inequality) that moderate this relationship.

Based on the theoretical assumptions and empirical evidence outlined above, I would expect that the more fragmented the media landscape is, the stronger presence of partisan media there is, and hence the higher the level of polarization. Thus, my first hypothesis states that higher levels of media fragmentation lead to higher levels of mass polarization.

*Hypothesis 1: Higher levels of media fragmentation lead to higher levels of mass polarization.*

**2.1 Institutional context: majoritarian vs proportional electoral system?**



**Figure 2.** A simplified illustration of the expected moderating effect that the electoral system has on the relationship between mass polarization and media fragmentation. *Source:* Larsson (2022)

Furthermore, based on the literature, we might also expect that the effect of media fragmentation will be bigger in certain institutional contexts. Several studies outside the U.S. have here sought to reveal what type of institutional settings intensify or mitigate mass polarization. It has here been suggested by some that majoritarian electoral systems are more polarizing than proportional (or consensus-based) ones (Bernabel, 2015; Gidron et.al, 2018; McCoy & Somer, 2019; Urman, 2020). McCoy & Somer (2019) for example argues that majoritarian electoral systems provide incentives for polarizing political agents “to attack and weaken the electoral support of rival blocs as an outward-looking strategy”, rather than using an “inward-looking strategy to consolidate one's own bloc”, which is more common in a

fragmented proportional system (McCoy & Somer, 2019:242). Moreover, in their cross-national study, Gidron et.al (2018) find that affective polarization is more intense in countries with majoritarian electoral systems (Gidron et.al, 2018).

However, others argue that proportional electoral systems induce party system polarization, not majoritarian ones (Adams & Rexford, 2018) This is based on the idea that majoritarian electoral systems incentivise parties to attract a larger spectrum of the electorate to maximize votes, which leads them to adopt more moderate policies instead of extreme policy positions (Dow, 2001). As for voters in these systems, it is assumed that they refrain from wasting their votes on smaller parties with more extreme policy positions as they have little chance of winning mandates in a disproportional voting system (Cox, 1997). Proportional electoral systems on the other hand create a more permissible electoral environment for parties to pursue more extreme policies and attract radical voters (Curini & Hino, 2012). However, there is little empirical evidence that proportional electoral systems actually polarize party systems and voters to the extent that has been assumed in the literature (see Adam & Rexford, 2018).

How would the polarizing effect of media fragmentation differ in these two systems then? As Urman (2020) argues, it might very well be the political context, the two-party system with a strongly polarized elite, that explains echo chambers and polarization on social networking sites in the U.S. (Urman, 2020). Following this argument, the polarizing effect of exposure to media might be primarily related to the majoritarian two-party political context of the country. To reiterate McCoy & Somer's (2019) arguments above, majoritarian electoral systems incentivise elites and political agents to take on an 'outward-looking' strategy to weaken and attack the rivaling political blocs. In a proportional electoral system, where parties seek to survive and gain support in a more fragmented political environment, elites tend to take on an 'inward-looking' strategy to consolidate one's own bloc (McCoy & Somer, 2019). Since the media is one of the primary platforms on which the elite spread their opinions and influence (Stroud, 2010), this is where much of their outward-looking strategy takes place. One can then expect that the media that consumers are exposed to in majoritarian electoral systems tend to be more polarized, and in turn be more prone to polarize media consumers.

***Hypothesis 2a:** The effect of media fragmentation on mass polarization is larger in majoritarian electoral systems.*

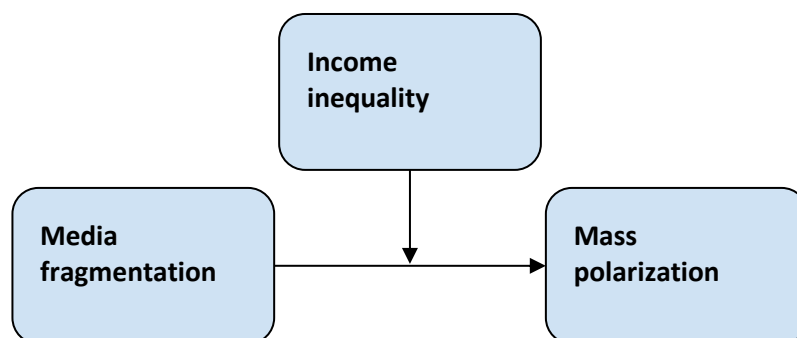
On the other hand, there are also strong theoretical reasons to expect that the media in proportional systems have a stronger effect on polarization than in majoritarian systems. In majoritarian systems media tend to be more vulnerable to be ‘captured by the dominant political tendency’ (Humphreys, 1996), and it is characterized by neutrality and “internal rather than external pluralism” (Hallin & Mancini, 2004:51). As Hallin & Mancini (2004) moreover argues, the media in majoritarian systems tend to mirror the catch-all politics that prevails in these systems in the form of ‘catch-all media’. On the contrary, proportional systems, they argue, media is characterized by external pluralism (i.e., a high-choice media environment reflecting a multiple of views) where it is more difficult for the political majority to sustain control over broadcasting governance. This in turn tends to induce political conflict, “damage the credibility of the media system” (Hallin & Mancini, 2004:52), and the “notion of politically neutral journalism is less plausible [as a] wide range of competing world views contend” (Hallin & Mancini, 2004:61). Based on the theoretical expectations outlined above, it would then seem plausible that media fragmentation has a more polarizing effect in proportional systems as the presence of partisan arguably should be more prominent here. However, Hallin & Mancini (2017) more recently rightfully notes that media systems are not static, and with the rise of online media there are several possibilities in terms of how the variation in the patterns of media systems might experience both ‘convergence’ that undermines national differences, and ‘continuity’ (i.e., online media will be shaped by the existing traditional structures) (Hallin & Mancini, 2017:164).

***Hypothesis 2b:** The effect of media fragmentation on mass polarization is larger in proportional/mixed electoral systems.*

All things considered, so far there is little direct empirical evidence that supports either of these positions, and to my knowledge, no studies have so far sought to directly explain how the different types of electoral systems moderate the relationship between media fragmentation and mass polarization on this scale. Nonetheless, there are credible reasons for why one might expect either majoritarian or proportional electoral systems to increase the effect of media fragmentation on mass polarization. Thus, due to the lack of previous studies on this specific moderating relationship, I here seek to fill an apparent research gap. Again, the advantage of

this study is that I will be able to utilize variation in electoral systems, which would not have been possible by exclusively studying the U.S.

## 2.2 Economic context: income inequality



**Figure 3.** A simplified illustration of the expected moderating effect of income inequality on the relationship between mass polarization and media fragmentation. *Source:* Larsson (2022)

The literature also suggests the accompanying rise in income inequality and socio-economic grievances is associated with the rise in political divisiveness, both in the American electorate (McCarty et.al, 2006; Garand, 2010; Voorheis et.al, 2015) and cross-nationally (Winkler, 2019; Gidron, 2018; Gu & Wang, 2021). It is argued here that an increased income gap between richer and poorer groups will create a schism in policy preferences on redistribution policy in which voters become more extreme, thus political parties “need to compete for voters moving further away from the position of the median voter” (Winkler, 2017:140). Moreover, income inequality and reduced income mobility may reinforce the perceptions among individuals of “winners” and “losers” in the economy which will further ‘exacerbate political division and polarization’ (Duca & Saving, 2016:396). Empirically, McCarty et.al (2006) for example finds that periods of high-income inequality in the U.S is correlated with the ideological polarization of the electorate and government (McCarty et.al, 2006). Building further on this study, Garand (2010) looks at data within American states and finds that higher levels of state income inequality produce higher levels of political and partisan polarization among state electorates and U.S. senators (Garand, 2010). Cross-national evidence also points towards these conclusions. In a study on 25 European countries and 251 regions, Winkler (2019) for example provides evidence that local income inequality is associated with an increase in ideological polarization among



individuals (Winkler, 2019). Moreover, Gidron et.al (2018), looking at 20 democratic countries, show that income inequality also intensifies affective polarization (Gidron et.al, 2018).

Due to the prominence of income inequality as an explanatory factor to rising levels of polarization in the literature, it might also be the case that the effect of media fragmentation on the level of mass polarization is dependent on the level of income inequality. There are several reasons why one might expect this to hold true. Firstly, as an indirect or direct result of rising income inequality, media outlets may follow the logic of political parties by trying to attract individuals that diverge from the centre (Duca & Saving, 2016). Secondly, the grievances and perceptions among groups and individuals that they are the “losers” of the economic system might make them more sensitive to the polarizing effects of partisan media. Thirdly, research shows that societies with higher levels of income inequality exhibit less social trust (Barone & Mocetti, 2016) which correlates with less trust in the media (Tsfati & Ariely, 2014). In other words, the effects of media fragmentation might be higher in countries with higher levels of income inequality as more people consume alternative forms of opinionated media. There is however also here little empirical evidence that supports this theory, but it is nonetheless an interesting research inquiry that seeks an answer. Once again, since my data and method allow for a great number of observations with a great deal of variation, this paper will be able to explore such a potential moderating relationship. Thus, I hypothesise that the effect of media fragmentation is larger in countries with higher levels of income inequality.

*Hypothesis 3: The effect of media fragmentation on polarization is larger in countries with higher levels of income inequality.*

### **3.0 Data & method**

#### **3.1 Research design, characteristics of data, & scope**

To test the hypothesis outlined above, I will employ a quantitative research design and apply a panel data analysis covering 71 democratic polities during a time period between 2000 and 2018. Due to the great availability of data for both the dependent and independent variables (see below), this type of statistical method is made possible here. Moreover, since I am interested in the drivers of political polarization it makes sense to see how my explanatory variable affects political polarization over time to see whether the effects are consistent within

different groups and time periods. In contrast to conducting a cross-sectional or time-series study, the panel data analysis (combining both) applied here will be able to detect and measure additional statistical effects, make use of a larger amount of data and variation between time and countries, as well as minimize estimation biases and account for the impact of country-specific attributes.

Regarding the sample of countries included in the analysis, they were first sorted out by a dichotomous democracy measure<sup>1</sup>, only including countries that held a democratic status for the whole time period. The reason for why only democratic countries were included in the sample is first and foremost a theoretical one. Traditionally, studies of mass polarization are mainly concerned with democratic states, involving an electorate and parties who are the primary subjects of the research. This study would like to contribute towards that literature. Furthermore, some democracies were excluded due to their low availability of data on the dependent variable (Iceland, Vanuatu) and some of the control variables (Taiwan, Israel, Malta). Where data for the control variables were missing for only a few years per group, values were imputed by a linear interpolation technique. The logic behind this method of replacing missing values is that when we have data for  $y$  and  $x$ , but we sometimes miss observations on  $y$ , we believe that  $y$  is a function of  $x$  (see Meijering, 2002; Noor et.al, 2015). In cases where the generated interpolated data held impossible values (e.g. negative values on a 1-10 index) in relation to the real values, I recoded them manually against the latest possible data point.<sup>2</sup> The resulting final sample of countries contains democracies all with a set of different characteristics in terms of the level of democratic consolidation, geography, and political culture: 7 countries from Asia, 1 from the Pacific, 4 from the Caribbean, 18 from Western Europe and North America, 8 from Sub-Saharan Africa, 2 from North Africa and the Middle East, 13 from Latin America, and 18 from Eastern Europe and Post-Soviet Union (see Table A1. in Appendix for full list). Due to this heterogeneity in the sample, I will be able to reveal whether effects and

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<sup>1</sup> The dichotomous democracy measure used here comes from the Boix-Miller-Rosato (BMR) Dichotomous Coding of Democracy. The authors define democracy in terms of satisfactory conditions for contestation and participation, where leaders have been chosen through free and fair elections (see Boix et.al, 2018)

<sup>2</sup> Percentage of values interpolated: *GDPpercap(log)* (1%), *Internet* (1%), *Decline* (27%), *Ecoglobal* (1%), *Broadband* (9%), *Top10share* (3.5%), *Top1share* (3.3%), *Unemployment* (1%) (see **Table A.2** in Appendix). A robustness test will be conducted in the analysis where *Decline* is excluded from the model to uncover any estimation biases that might occur as a result of the interpolated data.

patterns are generalizable and not just associated with a set of groups holding similar characteristics.

### 3.2 Measuring mass polarization

The dependent variable is operationalized by using the variable *political polarization (Polarization)* from the latest V-Dem dataset (see Coppedge et.al, 2021). V-Dem is a research project whose comprehensive data collection is made possible by its 3,500 Country Experts and over 100 Country Coordinators (V-Dem.net). The variable originates from the Civic and Academic Space survey designed by V-Dem, which assesses “several issues concerning the space for and state of civil society and academia” (Coppedge et.al, 2021:224). The survey in question has been coded and evaluated by Country Experts who primarily are academics or professionals working in media or public affairs with substantive knowledge of the given country and issue area (Coppedge, et.al, 2022).<sup>3</sup> The variable measures to what extent society is polarized into antagonistic political camps that affect social relationships beyond political discussion: “Societies are highly polarized if supporters of opposing political camps are reluctant to engage in friendly interactions, for example, in family functions, civic associations, their free time activities and workplaces” (Coppedge et.al, 2021:224). The variable is measured on a scale from 0-10<sup>4</sup> and asks: “Is society polarized into antagonistic, political camps?” (Coppedge et.al, 2021:224). The original data covers 179 countries and is ordinal, converted to interval by the measurement model.

To clarify – the type of polarization referred to in this paper does not only focus on the degrees of ideological differences or voting preferences (more commonly referred to as *ideological polarization* which studies of political polarization in political science tend to focus on) – this paper is interested in mass polarization that moreover extends from the political sphere to the societal, i.e., *affective polarization* (Iyengar et.al, 2019; Wilson, et.al, 2020) or *societal polarization* (McCoy et.al, 2018). This type of polarization may produce social conflict and in-

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<sup>3</sup> For more detailed information on the coding process and how V-Dem recruit country experts and deal with issues of bias, diversity, and transparency, see Coppedge et.al (2022)

<sup>4</sup> The variable was originally measured on a scale from -4 to 4 but was recoded to make it more intuitive. The higher the value, the higher the level of polarization.

and out-groups outside the political arena that affects the extent to which people might be willing to interact and cooperate with the other group (McCoy et.al, 2018). For example, studies of affective polarization in the U.S. often examine the degree to which Republicans and Democrats view each other negatively or positively. Thus, in one sense affective polarization is theoretically and empirically distinct from traditional studies on ideological polarization in the U.S which focus on differences in policy positions between supporters of the two parties (Iyengar et.al, 2019). However, as Abramowitz & Webster (2016) argues, one cannot exclude the one from the other in explaining the rising trends in negative partisanship in the U.S as political beliefs and social identities have become increasingly connected over the years (Abramowitz & Webster, 2016). Thus, separating the two is difficult, but one has to be wary of what type of polarization one measures since it might produce different results. Having that said, this paper will seek to explain the variance in the affective dimensions of political polarization, rather than the purely ideological. Thus, the variable used here captures mass polarization well since it focuses on divisions beyond politics and ideology, which means that it taps into affective and societal polarization as well.

It should also be noted that much of the literature so far measures mass polarization differently than this paper does, as they often focus on (extreme) ideological positions - usually using data from the World Value Survey (Gu & Wang, 2021); Comparative Manifesto Project (Melki & Pickering, 2014); or the European Social Survey (Winkler, 2019). However, the advantage of using the polarization measure from V-Dem is that it has better availability of data for more countries and years than the other available measures. It also taps into the affective dimensions of political polarization, which fits the purpose of this study.

### **3.3 Measuring media fragmentation**

The key independent variable, media fragmentation, is operationalized as *online media fractionalization (Mediafrac)* retrieved from the Digital Society Survey, which is included in the v.11.1 V-Dem data set (Coppedge et.al, 2021). The Digital Society Survey, which is designed by the Digital Society Project, “contains questions pertaining to the political environment of the internet and social media” (Coppedge et.al, 2021: 314).” The survey has collected data by using the V-Dem infrastructure - i.e., the surveys have been coded by Country Experts with substantial knowledge on questions about the specific country and issue area. The

variable is measured on a scale from 0 to 10<sup>5</sup> and asks the question: “*Do the major domestic online media outlets give a similar presentation of major (political) news?*” (Coppedge et.al, 2021: 326). A high value on the scale indicates that the major domestic online media outlets give opposing presentations of major political events, a low value indicates that they give a similar presentation of events (Coppedge et.al, 2021). The original variable covers 179 countries and is ordinal, converted to interval by the measurement model.

Online media fractionalization is a good measurement of media fragmentation since it measures to what extent major online media outlets give opposite or similar presentations of major events – which is a good proxy for how fragmented the online media landscape is since it taps into the diversity of media. It is however not a perfect measure of media fragmentation, since it does not tell us the sheer number of actual channels, sources, or platforms, or how many individuals consume it. In theory, one country could have few alternative sources of news and information for example, but which reports very differently on events. Another could have a diverse set of sources but give similar representations. However, based on the theory above, the extent to which the presentation of events are fractionalized would mirror levels of fragmentation well. A highly fractionalized online media environment would moreover reflect a strong presence of partisan media, which as discussed in the previous section is a by-product of media fragmentation and one of the central polarizing media platforms. Note also here that it measures *online* media rather than *traditional* media – which given the prominence of social media and online news today would still reflect the extent to which media, in general, is fragmented. Although as Kubin & Sikorski (2021) rightfully points out, “relevant proportions of media consumers still use classic media outlets like television for news and political information” (Kubin & Sikorski, 2021:194). Thus, another possible limit with my independent variable might be that it fails to capture the effects of traditional media fragmentation in favour of online media.

Moreover, media fragmentation has previously been measured in a variety of ways. Duca & Saving (2017) for example measure the concept as the share of households with cable or pay-tv (Duca & Saving, 2017). While not explicitly measuring media fragmentation, other studies have sought to test the theories of the effect of online and social media *usage* on polarization

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<sup>5</sup> The variable was originally measured on a scale from -4 to 4 but was recoded to make it more intuitive.

(Boxell et.al, 2018; Yang et.al, 2016); access to broadband internet access (Lelkes et.al, 2017); and media penetration measured as the number of televisions per 1000 people (Melki & Pickering, 2014). However, I still hold that my variable *Mediafrac* captures the concept of media fragmentation rather well in comparison to alternative measurements. Especially so given that finding another universal measure of media fragmentation across many countries and years is rather difficult. Thus, while recognising the limits of this variable, it is the best one available given the aim of this study.

### **3.4 Data reliability**

A final note here regards the credibility and reliability of the data sources used for the independent and dependent variables. V-Dem is a world-renowned research institution and “one of the largest-ever social science data collection efforts” (V-dem.net, 2021). The Digital Society Project, which is not perhaps as well-known, uses the V-Dem infrastructure in creating its surveys (Digital Society Project.org, 2021). To be clear, although they use the same infrastructure to collect their data, *Mediafrac* and *Polarization* come from two separate surveys. In other words, it is thus *assumed* not to be any bias in the coding process. While the expert surveys that constitutes the basis of our data are assumed not to involve any bias and has been coded with great consideration, it is not without flaws. It is entirely conditioned on the premise that we trust the experts whose knowledge forms the basis of the data that is used. However, experts are not alleviated from the possibilities of making errors, errors which may ‘bias the results in the statistical analyses’ (Marquardt, 2020). Thus, the V-Dem’s methodology is not perfect, but for the purposes of this study, its data is the best one available.

### **3.5 Additional variables**

Furthermore, I include several control variables that may affect mass polarization and confound with the independent variable. I have here considered several alternative explanations related to economic, institutional, and technological factors. Firstly, on the economic factors, I consider income inequality - measured here by both the top 10% income share (*Top10in*) and the top 1% income share (*Top1in*) – which has been highlighted in the literature as one of the main drivers of polarization. As an indirect or direct result of rising income inequality, media outlets may follow the logic of political parties by trying to attract individuals that diverge from the centre. Secondly, I include the latest available data on logged GDP per capita (*GDPpercap*

(*log*) from the World Bank Group (World Bank, 2020), as economic development may relax political polarization (Grechyna, 2016). How it might confound with X is less clear, however. The case might be that richer countries have better media infrastructure that allows for higher levels of media fragmentation.

Third, I include World Bank data on unemployment (*Unemployment*), measured by % of the total labour force (World Bank, 2020), and another related factor, economic decline (*Decline*), which is one of the main Fragile State Index indicators and measures ‘patterns of progressive economic decline’ (Haken et.al, 2020). In times of high unemployment and economic stagnation and decline, feelings of animosity towards those in charge of the economy might arise which may result in stronger support for extreme political parties (Bértoa & Rama, 2021). It is likely that the media becomes more fragmented in these settings as well. Unemployment and economic decline may further instigate elite polarization in terms of remedies that ought to be taken to improve the situation, which can spread to the masses (Gidron et.al, 2018).

Another economic factor that is frequently highlighted as a reason for the rise in support for extreme parties and mass polarization is related to the globalization backlash narrative. It is argued here that the flow of capital, trade and labour has increased the anti-establishment sentiments and support for extreme parties (especially in Europe and the U.S) by its effects on wages, manufacturing jobs and demographic shifts in terms of immigration (see Swank & Betz, 2003; Haupt, 2010). Therefore, I also control for economic globalization (*Ecoglobal*), an indicator from the KOF Index of Globalization that measures openness to trade, financial flows, and labour (Gygli et al., 2019).

Regarding the technological factors, I here seek to control for factors related to the usage and access to internet services - as the literature suggests that penetration of these services might have a polarizing effect (e.g., Lelkes et.al, 2017). The more widespread access there is to online news consumption and social media networks, the more exposed people ought to become to polarizing content through (pre) selective exposure. Therefore, I control for individuals using the internet (% of the population) (*Internet*) and fixed broadband subscriptions per 100 people (*Broadband*), which originates from the World Bank (World Bank, 2020). These variables are possibly also related to the main independent variable since the internet is one of the contributing factors to the fragmentation of the media landscape. Lastly, I control for the

democratic consolidation of a country and its electoral system. The former is captured by regime durability (*Durable*) - i.e., the number of consecutive years that the democratic regime of a country has been in place – originating from the Polity project (Marshall & Gurr, 2020). Older democracies, where institutions, the idea of the public good, and national identity are stronger, may be less vulnerable to higher levels of polarization (Mancini, 2013). Young democracies have on the other hand more characteristics (weak rule of law, more political violence, and social fragmentation) that make them prone to higher levels of mass polarization (Keefer, 2007). The electoral system (*Electoral System*), coded by Bormann & Golder (2013), is measured as a dummy variable that takes the value 0 for majoritarian electoral systems and 1 for mixed or proportional ones<sup>6</sup> (Bormann & Golder, 2013). This variable will be used as a control variable in the first specification and later as an interaction term (more on this below). Lastly, cultural factors such as ethnic fractionalization and cultural diversity were initially considered to be included but having done some initial tests these were omitted because of collinearity. All additional variables have been retrieved from the Quality of Government standard time-series dataset (jan21) (see Teorell et.al, 2021).

### 3.5 Interaction term

As specified by *H2ab* and *H3*, I will also consider whether the effect of media fragmentation on mass polarization is dependent on the institutional/political and economic context of a country. For the institutional context, I will use the variable *Electoral System*, which is a dummy variable, holding the value 0 for majoritarian electoral systems and 1 for mixed and proportional systems. To test the contingency of economic context, I will use the variable *Top10in* from the World Inequality Database (see Alvaredo et.al, 2020), which measures the ‘pre-tax national income share held by the top 10 percentile group’ (Alvaredo et.al, 2020). The reason for using top 10 share of income as a measurement for inequality is due to its high availability of data, and since it strongly correlates with other broader measures of inequality such as the Gini coefficient (Leigh, 2007).

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<sup>6</sup> Note: the original variable is categorical and takes 3 values (1. Majoritarian; 2. Proportional; 3. Mixed), but I decided here to recode it as a dummy variable as it made theoretical sense to separate majoritarian systems from the rest.

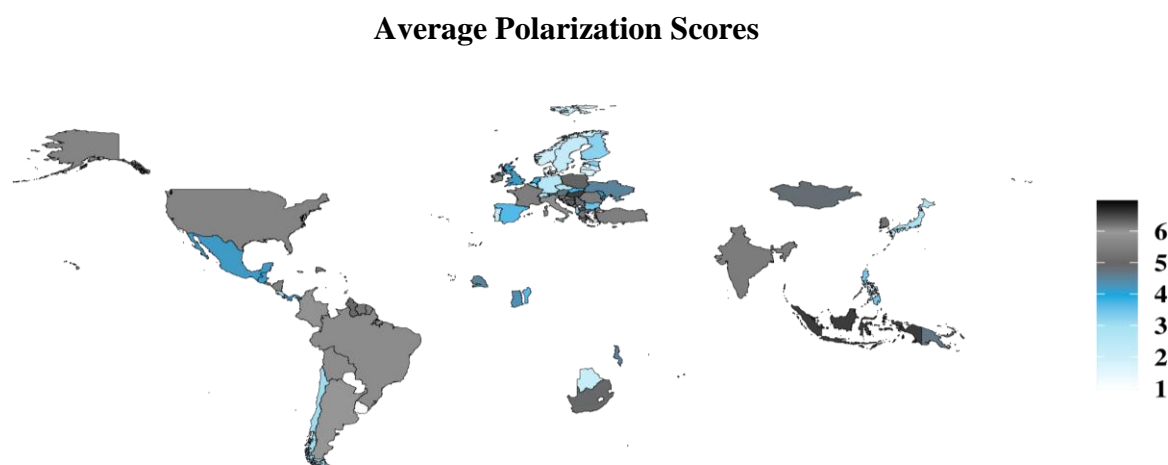


## 4.0 Results & analysis

### 4.1 Estimation strategy

Before I analyse the results of panel data, a couple of notes on the model that will be used here are fitting. First, the type of panel data model that will be specified ahead will be a fixed-effects (FE) model (or within-effects model), instead of a random-effects (RE) model. While the choice between these two models is highly contested in economics and political science (see Bell & Jones, 2014; Clark & Linzer, 2014), I have decided to use the FE model for mainly two reasons. First, we assume here that groups of countries in the panel data systematically differ from each other by unobservable characteristics, and we want to remove these effects to see the net within-unit effect of the independent variable on the dependent variable (Mummolo & Peterson, 2018). Secondly, the Hausman test here favoured the FE model by rejecting the null hypothesis (Hausman, 1978). Moreover, since the error term is assumed not to be independent, and tends to correlate with one another, all models will cluster the standard errors at the country level to control for this. I also include the time-fixed effects for all models to control for trends in the data and autocorrelation that occurs when two observations correlate with each other at various times in the time-series data. Finally, a robustness test will be conducted that excludes the variable *Decline* from the model due to its substantial amount of interpolated data (27%). I will do this to see whether the variable biases the estimations in any significant way.

### 4.2 Descriptive statistics



**Figure 4.** Illustrates the average *Polarization* scores for each of the 71 countries included in the sample. For more information about the countries, and a similar illustration for *Mediafrac*, see Appendix.

First, it would be interesting to see whether my data follow the general trends of increasing mass polarization that the literature suggests. **Figure 5.** illustrates trends in the average polarization over the 19-year period. Much in line with what previous literature has suggested, my data indicates that mass polarization has on average increased during the last two decades. The next question is: to what extent does media fragmentation covary with these trends? Based on **Figure 5.** the answer would at first look be, not much. The mean value for *Mediafrac* varies very little between 2000 and 2018 and does not on average follow the same upward trend as *Polarization* as one would have expected based on the literature. On the other hand, there is a great deal of variation in *Polarization* and *Mediafrac* happening *within* countries as we can draw out by looking at their respective residuals for each year. One can here observe that the standard deviation – i.e., the typical within-country change from year to year - for *Polarization* residuals is 1.67, and 1.21 for *Mediafrac* residuals (see **Table A.3** in Appendix).

In terms of correlation, since both variables are continuous, I will look at Pearson's correlation coefficient, which ranges from -1 to 1 (the closer to 1 or -1 the stronger the relationship). The correlation table highlights a moderately strong positive relationship between the aggregated values for *Polarization* and *Mediafrac* as expected at a correlation coefficient of 0.475 (see Table A.4 in Appendix). For illustrative purposes, one can also observe from the residual scatter plot in **Figure 6.** that there looks to be a linear relationship between the mean residuals of *Polarization* and *Mediafrac*. By looking at the residuals, we remove variation between countries, which leaves us with variation only within countries (which is our main concern here). Thus, descriptive evidence seems to suggest that mass polarization and media fragmentation has a positive relationship with each other.

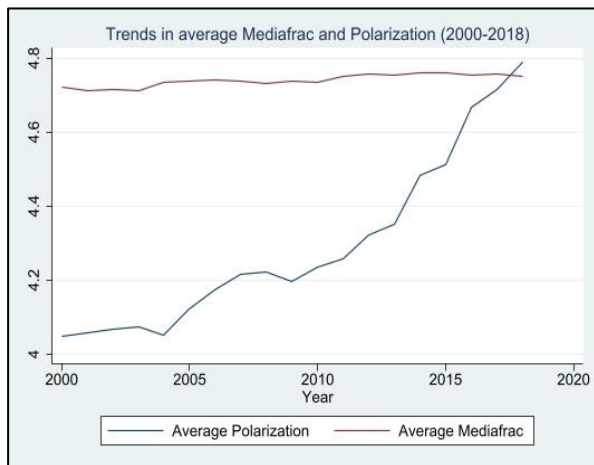


Figure 5. Trends

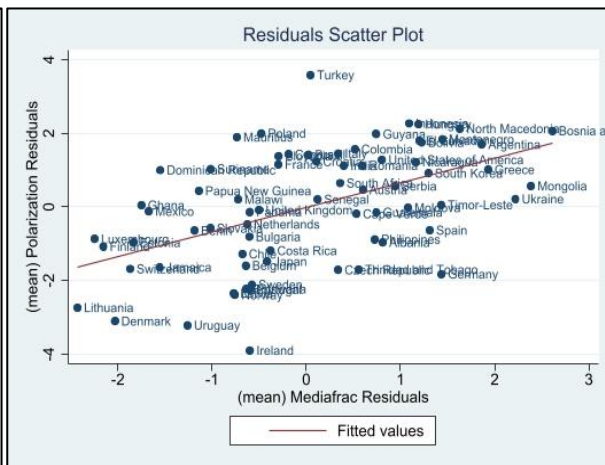


Figure 6. Scatter plot

**Figure 5.** Illustrates trends in the average value for *Polarization* and *Mediafrac* from 2000 to 2018. The blue line highlights that the average level of polarization among the 71 democracies has increased from 4.04 in 2000 to 4.79 in 2018. Average levels of *Mediafrac* have remained rather stable throughout this period, moving from 4.72 in 2000 to 4.75 in 2018. **Figure 6.** Illustrates the mean value of residuals for *Mediafrac* and *Polarization* for each country, highlighting a linear relationship within countries.

### 4.3 Statistical analysis

While there indeed seems to be a linear relationship between the two, I am yet to test whether media fragmentation holds any statistical impact on mass polarization within countries during the time period of interest. As the bivariate FE model with clustered standard errors and time fixed effects in Table 1 shows, although there is a positive coefficient slope as expected, there is no significant relationship between *Mediafrac* and *Polarization*. The relationship moreover remains non-significant across the other models where the economic (Model 2), institutional (Model 3), and technological (Model 4) control variables are included. Only economic decline and regime durability turn out significant in Models 3 & 4, the former having a negative relationship (contrary to what was expected), the latter having a positive relationship (i.e., the more economic decline the more mass polarization). Thus, I fail to reject the null hypothesis of *H1* that there is no relationship between mass polarization and media fragmentation.

**Table 1. DV: Polarization**

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
<i>Mediafrac</i>	0.144 (0.47)	0.128 (0.44)	0.268 (0.33)	0.279 (0.34)
<i>Top10share</i>		1.857 (3.59)	2.283 (3.93)	2.199 (4.00)
<i>Top1share</i>		0.903 (3.29)	1.438 (3.52)	1.700 (3.56)
<i>GDPpercap(log)</i>		0.169 (0.51)	0.301 (0.55)	0.214 (0.60)
<i>Unemployment</i>		0.012 (0.02)	0.015 (0.02)	0.015 (0.02)
<i>Decline</i>		0.086 (0.04)	0.090** (0.04)	0.089** (0.04)
<i>Ecoglobal</i>		-0.009 (0.01)	-0.011 (0.01)	-0.011 (0.01)
<i>Regime Durability</i>			-0.030** (0.01)	-0.031** (0.01)
<i>Electoral system</i>			-0.199 (0.15)	-0.201 (0.16)
<i>Broadband</i>				-0.005 (0.01)
<i>Internet</i>				-0.001 (0.01)
<b>Constant</b>	3.368 (2.19)	1.057 (5.77)	-0.079 (6.06)	0.691 (6.36)
<b>Time effects</b>	Yes	Yes	Yes	Yes
<b>Country effects</b>	Yes	Yes	Yes	Yes
<b>R<sup>2</sup></b>	0.186	0.221	0.245	0.247
<b>Countries</b>	71	71	71	71
<b>N</b>	1349	1349	1349	1349

Note: Standard errors in parentheses \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.10.

Model 2 includes the economic control variables, Model 3 includes the institutional control variables, and Model 4 includes the technological control variables. All models control for time fixed effects and clustered standard errors on the country level.

#### 4.3.1 Interaction effects

#### 4.3.2 Electoral system

However, is this always the case? Are there certain contexts where we could expect otherwise? As my remaining hypotheses state, I am also interested in whether the effect of media fragmentation on polarization is bigger in countries with majoritarian or proportional/mixed electoral systems and high inequality or not. As I have previously been theorising, the case might very well be that the polarizing effect of media fragmentation is dependent on the

economic and institutional context of a country. Firstly, to test **H2ab**, I have specified the interaction effect between *Mediafrac* and *Electoral System* on *Polarization* in **Table 2**. As Model 1 reveals, for countries scoring 0 on the *Electoral System* variable - i.e., having a majoritarian electoral system -, the effect of *Mediafrac* on *Polarization* is *almost* statistically significant at the 5% level (having a p-value of 0.055) with a positive coefficient slope of 2.421 (remembering that the scale of measurement is 0-10). Furthermore, the difference in effect between proportional/mixed (1) and majoritarian (0) is also statistically significant at the 10% level with a coefficient of -2.36 ( $2.42 - 2.36 = 0.06$  - i.e., the effect in proportional/mixed systems is almost equal to zero). Thus, from the outlook of the bivariate model, we can conclude that *Mediafrac* has a bigger effect in majoritarian electoral systems than in proportional/mixed ones (albeit being just above the desired 5% level of significance). In other words, compared to previous results, there is something interesting at play here.

Moving on, when the economic control variables are introduced in Model 2, the effect of *Mediafrac* on *Polarization* in majoritarian electoral systems does turn significant at the 5% level ( $p < 0.05$ ) with a slightly higher positive coefficient slope of 2.562. Moreover, the difference in effect between majoritarian and proportional/mixed systems, as indicated by the interaction term (*Electoral System = 1 # Mediafrac (difference)*), also becomes significant at the 5% level ( $p < 0.05$ ). These effects remain significant in Model 4 when institutional and technological variables are added (although the difference between 0 & 1 increases in significance level from 5% to 10% in Model 3). Moreover, the difference in effect between majoritarian (0) and proportional/mixed (1) systems is significant at the 5% level ( $2.746 - 2.551 = 0.195$ ), and the coefficient slope has gone from 2.421 in Model 1 to 2.746 in Model 4. This suggests that there might be a suppression effect of the control variables, i.e., they ‘increase the predictive validity of our key variables’ rather than reduce it, as mediating or confounding variables tend to do (see MacKinnon et.al, 2000). Another explanation is that more of the variance in the data is explained when we add the control variables, which reduces the standard errors and thus the significance of our relationship. In this case, the p-value for *Mediafrac* drops from 0.055 in the bivariate interaction model to 0.027 when adding all the control variables, while the sign of the coefficient remains positive (see **Table B.1 & B.2** in Appendix). Thus, based on **Table 2.**, there is a significant positive statistical effect of *Mediafrac* on *Polarization*

in majoritarian electoral systems holding all other variables constant, but not in proportional/mixed electoral systems.

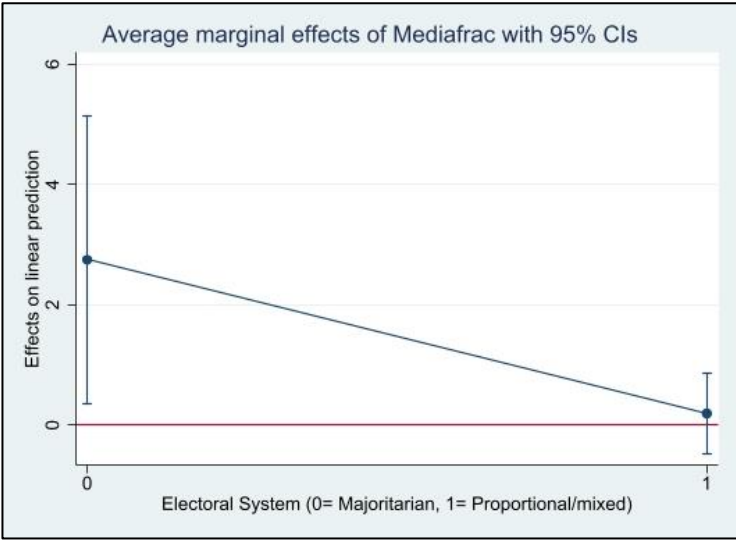
**Table 2. DV: Polarization. Interaction term: Electoral System**

	(1)	(2)	(3)	(4)
<b>VARIABLES</b>	Model 1	Model 2	Model 3	Model 4
<i>Mediafrac (Electoral System =0)</i>	2.421*	2.562**	2.575**	2.746**
	(1.24)	(1.16)	(1.19)	(1.22)
<i>Electoral System =1 (Mediafrac =0)</i>	16.587*	17.666*	16.773*	17.907*
	(9.45)	(8.90)	(8.82)	(9.04)
<i>Electoral System =1 # Mediafrac (difference)</i>	-2.357*	-2.513**	-2.392*	-2.551**
	(1.33)	(1.26)	(1.25)	(1.28)
<i>Top10share</i>		0.040	0.546	0.342
		(2.98)	(3.22)	(3.34)
<i>Top1share</i>		1.880	2.317	2.753
		(2.82)	(3.02)	(3.08)
<i>GDPpercap(log)</i>		0.245	0.349	0.199
		(0.50)	(0.53)	(0.58)
<i>Unemployment</i>		0.011	0.014	0.013
		(0.02)	(0.02)	(0.02)
<i>Decline</i>		0.103**	0.106**	0.106**
		(0.05)	(0.04)	(0.04)
<i>Ecoglobal</i>		-0.010	-0.012	-0.012
		(0.01)	(0.01)	(0.01)
<i>Regime Durability</i>			-0.028**	-0.029**
			(0.01)	(0.01)
<i>Broadband</i>				-0.008
				(0.01)
<i>Internet</i>				-0.000
				(0.01)
<b>Constant</b>	-11.827	-15.266	-15.511	-15.196
	(8.32)	(10.90)	(11.35)	(11.13)
<b>Time effects</b>	Yes	Yes	Yes	Yes
<b>Country effects</b>	Yes	Yes	Yes	Yes
<b>R<sup>2</sup></b>	0.215	0.250	0.271	0.276
<b>Countries</b>	71	71	71	71
<b>N</b>	1349	1349	1349	1349

Note: Standard errors in parentheses \*\*\*p <0.01, \*\*p<0.05, \*p <0.10.

Model 2 includes the economic control variables, Model 3 includes the institutional control variables, and Model 4 includes the technological control variables. All models control for time fixed effects and clustered standard errors on the country level.

Furthermore, based on Model 4 in **Table 2.**, the marginal effect of *Mediafrac* on *Polarization* in majoritarian electoral systems compared to proportional/mixed systems holding all other variables constant is illustrated in **Figure 7.** Here one can observe that the effect of *Mediafrac* on *Polarization* is positive within the 95% confidence interval, while there is a non-significant effect of *Mediafrac* in proportional/mixed systems with a coefficient close to 0 (0.195 to be precise). In other words, for each 10-percentage point increase in *Mediafrac*, *Polarization* increases by 2.74 in majoritarian electoral systems holding all other variables constant. Considering that the scale of measurement for *Polarization* is 0-10, and that its mean value is 4.29, the magnitude of this effect is rather large. In sum, these results are much in line with **H2a** and seem to confirm that the effect of media fragmentation on polarization is stronger and statistically significant in countries with a majoritarian electoral system. I can also reject **H2b** that the effect of *Mediafrac* would be larger in proportional/mixed systems.



**Figure 7. Electoral System margins plot**

**Figure 7.** Illustrates the average marginal effect of *Mediafrac* on *Polarization* in majoritarian electoral systems (0) and proportional/mixed systems (1) holding all other variables constant. It highlights that when *Elesys* is set to 0, the effect of *Mediafrac* on *Polarization* is significant with a coefficient slope of 2.74. Meanwhile, the effect is close to 0 in proportional/mixed electoral systems.

To further test the robustness of the results, I also test to remove the variable *Decline* from the model, which had 27% of its data imputed by a linear interpolation technique (see data section), to see whether the effects are overestimated as a result of this variable. As we can observe from **Table B.3** and **Figure B.1** in the Appendix, the results are substantively similar when excluding

*Decline* from the specification. While being just above the 5% significance level (p-value=0.056), the effect of *Mediafrac* remains large, having a coefficient of 2.43 (see Appendix). The margins plot also looks substantively similar. In other words, the difference when excluding *Decline* from the specification is minimal.

#### 4.3.3 Income inequality

As *H3* states I also expect that the effect of media fragmentation on mass polarization is stronger in countries with higher income inequality. Model 1 in **Table 3.** highlights that when *Top10share* is set to zero (no inequality), there is a significant positive relationship between *Mediafrac* and *Polarization* with a coefficient of 1.589. The effect moreover remains significant when adding all the control variables in Model 4, having a slightly lower coefficient at 1.372. However, since *Top10share* is a continuous variable, this alone does not tell us anything about what levels of inequality increase the effect of *Mediafrac* on *Polarization*. To reiterate *H3*, I am here interested in whether the effect of *Mediafrac* is bigger in countries with high levels of income inequality.

**Figure 7.** shows the average marginal effects of *Mediafrac* on three different levels of *Top10share*: the lowest at .245, the mean at .415, and the highest value at .693. It reveals that *Mediafrac* holds a significant and positive statistical effect on *Polarization* at its lowest value. However, at the mean value of *Top10share*, the effect of *Mediafrac* becomes non-significant, while still having a positive sign. At the highest level, the relationship surprisingly becomes a negative one but is still non-significant. In other words, the effect of *Mediafrac* on *Polarization* is not stronger in countries with higher levels of income inequality. On the contrary, these results seem to indicate that only at low levels of income inequality does *Mediafrac* holds a significant positive effect on *Polarization*.

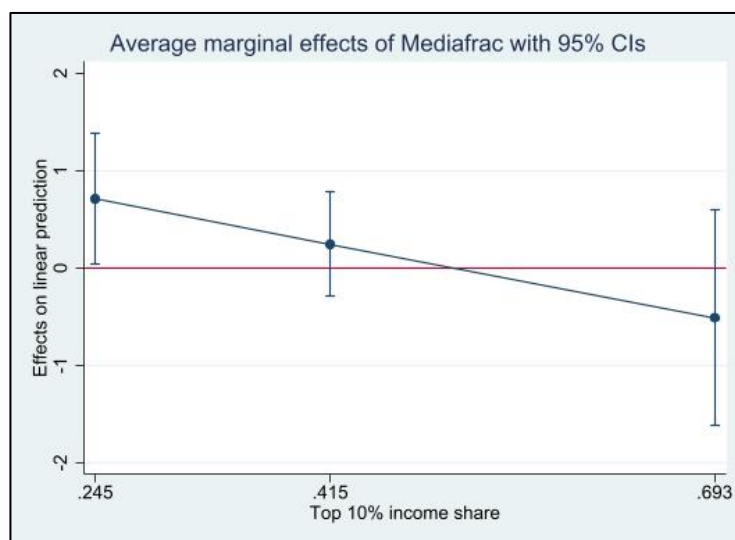


**Table 3. DV: Polarization. Interaction term: Top10share**

	(1)	(2)	(3)	(4)
<b>VARIABLES</b>	Model 1	Model 2	Model 3	Model 4
<i>Mediafrac</i>	1.579** (0.71)	1.516** (0.70)	1.385** (0.64)	1.375** (0.66)
<i>Top10share</i>	18.544** (8.61)	18.894** (8.88)	16.314** (7.50)	15.973** (7.71)
<i>Mediafrac # Top10share</i>	-3.432* (1.88)	-3.323* (1.78)	-2.759* (1.53)	-2.716* (1.58)
<i>Top1share</i>		-1.183 (3.28)	-0.427 (3.31)	-0.160 (3.32)
<i>GDPpercap(log)</i>		0.215 (0.52)	0.310 (0.55)	0.270 (0.60)
<i>Unemployment</i>		0.010 (0.01)	0.013 (0.02)	0.013 (0.02)
<i>Decline</i>		0.080 (0.04)	0.084** (0.04)	0.084** (0.04)
<i>Ecoglobal</i>		-0.008 (0.01)	-0.010 (0.01)	-0.009 (0.01)
<i>Regime Durability</i>			-0.022*** (0.01)	-0.023*** (0.01)
<i>Electoral System</i>			-0.190 (0.15)	-0.202 (0.16)
<i>Broadband</i>				-0.003 (0.01)
<i>Internet</i>				-0.001 (0.01)
<b>Constant</b>	-4.369 (3.34)	-6.220 (6.92)	-5.838 (6.76)	-5.386 (7.39)
<b>Time effects</b>	Yes	Yes	Yes	Yes
<b>Country effects</b>	Yes	Yes	Yes	Yes
<b>R<sup>2</sup></b>	0.232	0.253	0.265	0.267
<b>Countries</b>	71	71	71	71
<b>N</b>	1349	1349	1349	1349

Note: Standard errors in parentheses \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.10.

Model 2 includes the economic control variables, Model 3 includes the institutional control variables, and Model 4 includes the technological control variables. All models control for time fixed effects and clustered standard errors on the country level.



**Figure 8.** *Top10share* margins plot

**Figure 8.** Shows the average marginal effect of Mediafrac on Polarization on three separate levels of income inequality: the lowest value, the mean value, and the highest value. At 0.245, *Mediafrac* holds a significant positive effect on *Polarization*. At the mean value of 0.415, the effect becomes non-significant, but still positive. At the highest value of 0.693, the effect becomes negative while remaining non-significant.

## 5.0 Discussion & conclusion

To conclude, this study has sought to explore the relationship between media fragmentation and mass polarization within 71 democracies over a 19-year period. Media fragmentation has been frequently blamed for the increasing levels of mass polarization in the U.S. during the last decade, and several studies have empirically supported this claim. However, few studies have so far set out to test the generalizability of these studies that have almost exclusively been conducted in the U.S. Thus, two core questions were set out at the beginning of the paper: Is there a positive general relationship between media fragmentation and mass polarization within many countries and time? Or is this relationship contingent on certain institutional and economic contexts? Thus, based on the literature I hypothesised first that higher levels of media fragmentation lead to higher levels of polarization, and then that the effects of media fragmentation are moderated depending on the institutional and economic context of a country. Results from my fixed-effects panel data models provided that, controlling for several other factors relating to the economy, institutions and technology, there is no general relationship between media fragmentation and mass polarization. While there is no general relationship, I

also set out to test whether the effect of media fragmentation is dependent on the electoral system and the level of income inequality of a country. I here found that in accordance with *H2a*, in countries with majoritarian electoral systems (e.g., Botswana, the U.S., France, and India) media fragmentation has a significant positive effect on mass polarization, but not in proportional/mixed systems (*H2b*). As for *H3*, only at low levels of income inequality does media fragmentation have a significant effect on mass polarization, which is contrary to what was initially expected. Although, it should be clarified that by “low levels”, I here refer to the very minimum. As **Figure 8.** highlights above, as we move from the minimum level to the mean, the significant effect diminishes. Thus, one should be careful of drawing any certain conclusions from these results.

My findings confirm what previous literature has suggested about the intensifying effects of majoritarian institutions on mass polarization, but it also sheds new light on the interactive effect that majoritarian electoral systems have on the relationship between media fragmentation and polarization. Since one of the central aims of this paper was to explore the generalizability of individual studies performed in the U.S., one can now conclude that media fragmentation does not lead to more mass polarization in all countries and settings. In other words, it is not possible to generalize previous studies on the relationship between media fragmentation and mass polarization without accounting for the effects of the given electoral system. Instead, as Urman (2020) hinted, a strong case could be made that the polarizing effect of media fragmentation in the U.S. has been enabled by its majoritarian political setting (see Urman, 2020).

This means that previous literature that supports the polarizing media fragmentation narrative *can* be generalizable to other countries to the extent that they share similar political settings. Indeed, as discussed in section 2, elites tend to adopt more divisive outward strategies in majoritarian electoral systems, and media is here the main platform on which elites spread their influence and shape opinion (McCoy & Somer, 2019; Stroud, 2010). It might very well be the case that fractionalized elites are a strong force themselves in driving the media fragmentation to split opinion and instigate polarization to advance their political goals. Moreover, elite polarization and conflict between institutions tend to receive frequent coverage in the traditional and online news media, more so than actual policy matters sometimes. This in turn has been shown to have a top-down effect on mass polarization (see Banda & Cluverius, 2018). This

process does not necessarily have to be confined to countries with majoritarian electoral systems, but due to its two-sided political nature and outward elite strategy, it would seem more plausible here.

The reason why I did not find any effects in proportional/mixed systems, where there were strong theoretical reasons to expect otherwise (see Cox, 1997; Dow, 2001; Hallin & Mancini, 2004), may have been due to how media fragmentation was operationalized, and that party polarization and ideological polarization are different concepts from affective polarization (although they do tend to feed one another, see Abramowitz & Webster, 2016; Iyengar et.al, 2019). Gidron et.al (2018) for example showed that majoritarian electoral systems intensify affective polarization, not party or issue polarization (see Gidron et.al, 2018). Furthermore, even if the media environment would have more external pluralism, as proportional systems were expected to have, *Mediafrac* does not capture the high-choice element of media fragmentation. In theory, there could be little external pluralism, but just a few online media outlets could still report very differently on events. The case of Hungary is a good example of a majoritarian system, with a highly polarized society, where external pluralism in the media is low (Vegetti, 2019). While external pluralism in the media is low, the country still scores high (6.8) on *Mediafrac* (mean). The reasons are probably due to the fact that the government-owned media and (the few) opposition media report very differently on political issues (Vegetti, 2019). I would in this case argue that external pluralism in the media per-se does not polarize consumers. What matters more are the partisan elements that emerge from the process of media fragmentation, and how fractionalized elites use the media as part of their outward strategy to spread their influence. It is in this type of media environment (which is typified by the U.S.), that consumers of media are vulnerable to the polarizing effects of (pre) selective-exposure and echo chambers. Again, in a winner-takes-it-all political context that characterizes majoritarian electoral systems, this is more likely to happen.

However, there is clearly a need for further theoretical investigation into these mechanisms. Future research should continue to examine in what ways and through which type of actors the media polarize the masses in majoritarian systems. This would be helpful to get a deeper theoretical understanding of why the polarizing effect of media fragmentation is bigger in majoritarian electoral systems contra proportional ones. Moreover, it is not entirely clear why countries with low levels of income inequality would be more susceptible to the polarizing

effects of media fragmentation, as the literature suggests that it should be the other way around. This would also be a question open for further investigation in future research.

Furthermore, there are naturally certain limits with this paper which may affect the validity of the results. First, as I discussed in the data section, while having a lot of advantages in terms of data availability and parsimony, my operationalization of media fragmentation is not perfect. It does not explicitly measure some aspects of media fragmentation, and it does not capture the quantity of major online media outlets as would be indicative of a high-choice media environment. Rather, it captures the splintering nature of media fragmentation, the process where media seeks to capture a fragmented audience of different political and cultural values. Thus, I have here argued that in defence of my independent variable, the more differently online media outlets report on political events, the more fragmented the media landscape is. In that sense, *Mediafrac* does capture the concept well. This brings us to another issue, that of reversed causality. The case might very well be that the more polarized a country becomes the more fragmented the media will become as a direct result (see Tucker et.al, 2018). Indeed, the media landscape might merely mirror an already polarized society. On the other hand, if this actually would have been the case, it would have been reflected in the results of this paper.

Secondly, it is not completely clear what type of polarization my dependent variable is measuring in relation to how previous literature has measured and distinguished the concept. This is arguably an issue when it comes to the replicability and comparability of my study. However, due to the aim of this study to test generalizability and provide a nuanced picture of the relationship, I am willing to make the case that the dependent variable used here is adequate. Still, I do encourage future studies to assess and compare different types of polarization measurements to see whether they correlated or bring different results. Media fragmentation might have an effect on affective polarization, but not on ideological polarization for example. Lastly, my results might admittedly be affected by omitted variable bias. It would for example have been beneficial for my paper if a variable measuring immigration was included, as previous literature has highlighted its significance in understanding mass polarization (e.g., McCarty et.al, 2006; Winkler, 2017). While no suitable explicit measure could be identified, I sought to tap into this dimension by including economic globalization, and ethnic fractionalization (which was omitted due to collinearity). Furthermore, one could also expect

social trust and trust in institutions to play an explanatory role. Again, while some measures do exist, their data availability is far too low to be included in this study.

All things considered, despite having certain limitations, I believe that this paper has made important contributions towards the literature on mass polarization and media fragmentation, as well as to the broader field of democracy studies. Indeed, the negative consequences of severe mass polarization for the well-being of democracy are well known, and I have with this study shed more light on how (and importantly *when*) the media contributes towards the polarization of the electorate. While the ever more high-choice online media environment might be difficult to control, governments do have the possibility to reform their electoral systems to alleviate the polarizing effects of media fragmentation. Indeed, as I have shown in this paper, if we want to prevent our democracies from spiralling further into tribalism politics, social conflict, and institutional gridlocks, it does matter what type of electoral system that is in place.

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## A. Appendix

### A.1 Descriptive statistics

**Table A 1: Summary statistics**

<b>COUNT RY CODE</b>	<b>COUNTRY</b>	<b>POLARIZAT ION (MEAN)</b>	<b>MEDIAFR AC (MEAN)</b>	<b>ELECTORAL SYSTEM (0 = MAJORITARIAN, 1 = PROPORTIONAL/MIXED)</b>
ALB	Albania	3.326	5.551	1
ARG	Argentina	5.988	6.603	1
AUT	Austria	4.757	5.341	1
BEL	Belgium	2.700	4.097	1
BEN	Benin	3.647	3.553	1
BOL	Bolivia	6.042	5.964	1
BIH	Bosnia and Herzegovina	6.360	7.351	1
BWA	Botswana	2.060	4.102	0
BRA	Brazil	5.713	4.763	1
BGR	Bulgaria	3.481	4.135	1
CPV	Cape Verde	4.102	5.272	1
CHL	Chile	3.013	4.061	1
COL	Colombia	5.860	5.255	1
CRI	Costa Rica	3.102	4.362	1
HRV	Croatia	5.522	4.848	1
CYP	Cyprus	5.718	4.551	1
CZE	Czech Republic	2.579	5.077	1
DNK	Denmark	1.188	2.707	1
DOM	Dominican Republic	5.293	3.19	1
SLV	El Salvador	6.093	5.940	1

EST	Estonia	3.323	2.903	1
FIN	Finland	3.217	2.585	1
FRA	France	5.449	4.443	0
DEU	Germany	2.465	6.175	1
GHA	Ghana	4.34	2.988	0
GRC	Greece	5.304	6.669	1
GTM	Guatemala	4.144	5.484	1
GUY	Guyana	6.270	5.483	1
HUN	Hungary	6.539	5.933	0
IND	India	5.410	5.139	0
IDN	Indonesia	6.560	5.832	1
IRL	Ireland	.3924	4.142	1
ITA	Italy	5.744	5.080	1
JAM	Jamaica	2.653	3.182	0
JPN	Japan	2.812	4.325	1
LVA	Latvia	1.946	3.972	1
LTU	Lithuania	1.553	2.311	1
LUX	Luxembourg	3.42	2.492	1
MWI	Malawi	4.496	4.016	0
MUS	Mauritius	6.186	4.003	0
MEX	Mexico	4.171	3.068	1
MDA	Moldova	4.270	5.820	1
MNG	Mongolia	4.861	7.125	0
MNE	Montenegro	6.131	6.185	1
NLD	Netherlands	3.822	4.115	1
NIC	Nicaragua	5.511	5.902	1
MKD	North Macedonia	6.418	6.371	1
NOR	Norway	1.901	3.982	1

PAN	Panama	4.157	4.141	1
PNG	Papua New Guinea	4.728	3.598	0
PHL	Philippines	3.412	5.467	1
POL	Poland	6.29	4.264	1
PRT	Portugal	2.048	4.138	1
ROU	Romania	5.418	5.337	1
SEN	Senegal	4.497	4.861	1
SRB	Serbia	4.858	5.681	1
SVK	Slovakia	3.710	3.721	1
SVN	Slovenia	5.674	4.447	1
ZAF	South Africa	4.938	5.098	1
KOR	South Korea	5.207	6.036	1
ESP	Spain	3.658	6.050	1
SUR	Suriname	5.323	3.725	1
SWE	Sweden	2.180	4.163	1
CHE	Switzerland	2.607	2.87	1
TLS	Timor-Leste	4.348	6.172	1
TTO	Trinidad and Tobago	2.592	5.296	0
TUR	Turkey	7.876	4.784	1
UKR	Ukraine	4.507	6.959	1
GBR	United Kingdom	4.207	4.24	0
USA	United States of America	5.572	5.543	0
URY	Uruguay	1.077	3.478	1

**Table A 2: Summary statistics**

<b>Variable</b>	<b>Obs (% imputed data)</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Polarization	1349 (0%)	4.293	1.672	.392	10
Mediafrac	1349 (0%)	4.74	1.214	2.236	7.896
Top10share	1302 (3.5%)	.414	.096	.246	.694
Top1share	1304 (3.3%)	.146	.057	.061	.445
Gdppercap(log)	1335 (1%)	9.745	.941	6.594	11.656
Unemployment	1335 (1%)	8.808	6.08	.69	37.25
Decline	986 (27%)	4.766	1.633	1	9.2
Ecoglobal	1335 (1%)	64.874	14.208	26.578	92.774
Regime Durability	1349 (0%)	35.159	35.466	0	209
Electoral System	1349 (0%)	2.035	.599	1	3
Broadband	1230 (9%)	12.681	12.643	0	46.331
Internet	1335 (1%)	42.505	29.344	0	98.137

**Table A 3: Residuals Summary Statistics**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
Polarization_residuals	1,349	1.99e-08	1.67218	-3.900087	5.864912
Mediafrac_residuals	1,349	6.10e-09	1.213991	-2.503867	3.156133

**Table A 4: Correlation table**

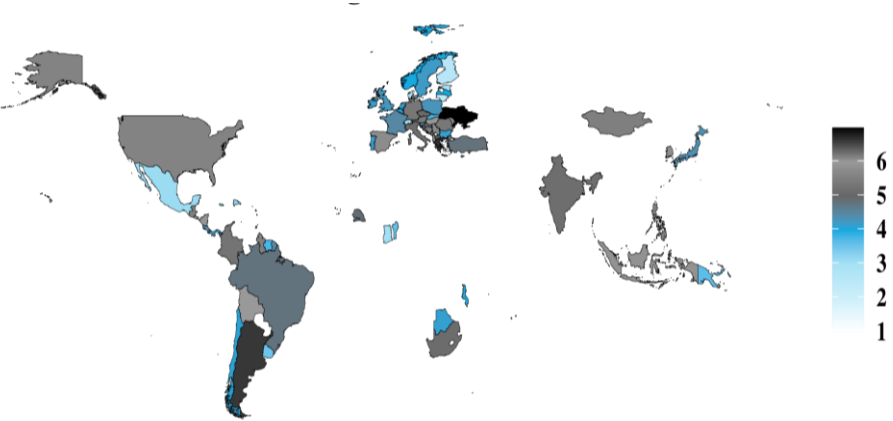
**Pairwise correlations (aggregated values)**

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Variables	(1)	(2)
(1) <i>Polarization</i>	1.000	
(2) <i>Mediafrac</i>	0.475	1.000

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**Figure A 1: Average Mediafrac Scores**



**B. Appendix**

**B.1 Statistical analysis**



**Table B.1: Electoral System Interaction Effect Model 1**

(Std. err. adjusted for 71 clusters in ccode)

polarization2	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
Mediafrac2	2.421047	1.239664	1.95	0.055	-.0513848	4.893479
1.elesys	16.58694	9.452903	1.75	0.084	-2.266282	35.44016
elesys#c.Mediafrac2 1	-2.357384	1.329843	-1.77	0.081	-5.009672	.2949035

**Table B.2: Electoral System Interaction Effect Model 4**

(Std. err. adjusted for 71 clusters in ccode)

polarization2	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
Mediafrac2	2.746348	1.217145	2.26	0.027	.3188285	5.173867
1.elesys	17.90686	9.040926	1.98	0.052	-.124699	35.93842
elesys#c.Mediafrac2 1	-2.551066	1.278481	-2.00	0.050	-5.100915	-.0012162
top10in	.3416324	3.335632	0.10	0.919	-6.311076	6.994341
top1in	2.752976	3.083977	0.89	0.375	-3.397823	8.903775
gdppercap	.1994353	.5763447	0.35	0.730	-.9500479	1.348918
decline	.1062322	.044511	2.39	0.020	.0174579	.1950066
p_durable	-.0290933	.0124589	-2.34	0.022	-.0539418	-.0042449
ecoglobal	-.0116854	.0082744	-1.41	0.162	-.0281882	.0048175
unemployment	.0134727	.01579	0.85	0.396	-.0180195	.0449648
internet	-.0003848	.0050184	-0.08	0.939	-.0103936	.009624
broadband	-.0082132	.0084678	-0.97	0.335	-.0251017	.0086753

**Table B.3: Robustness check (excluding *Decline*)**

polarization2	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
Mediafrac2	2.434623	1.255111	1.94	0.056	-.0686159	4.937862
1.elesys	15.72718	9.313241	1.69	0.096	-2.847498	34.30185
elesys#c.Mediafrac2						
1	-2.229966	1.314858	-1.70	0.094	-4.852368	.3924363
top10in	1.581942	3.12899	0.51	0.615	-4.658633	7.822517
top1in	1.606277	2.923071	0.55	0.584	-4.223603	7.436158
gdppercap	-.0939982	.5298213	-0.18	0.860	-1.150693	.962697
p_durable	-.0283273	.0137052	-2.07	0.042	-.0556614	-.0009931
ecoglobal	-.0121614	.0083446	-1.46	0.149	-.0288041	.0044813
unemployment	.0141671	.0154684	0.92	0.363	-.0166837	.045018
internet	.0000116	.0049692	0.00	0.998	-.0098991	.0099223
broadband	-.0084225	.0079339	-1.06	0.292	-.0242462	.0074013

**Figure B 1: Robust margins plot (excluding *Decline*)**

