Political Behavior under Polarization

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Acknowledgments

The hustle and bustle of a doctoral student's life generally leaves little space to reflect what has actually happened. I often state that the only thing one can really plan is that an arbitrary plan usually does not work as planned. In my opinion, this is especially true for doctoral projects. While I like appropriate planning, I do not regret having engaged into this doctoral project at all. With the journey now coming to an end, I am happy to take some time to express my gratitude to the people that contributed the most. Notably, the acknowledgments are, at least in my opinion, an underrated part of any project, even though there is some serious doubt whether expressing gratitude is even rational.

First of all, I would like thank my supervisor Nils Goldschmidt very deeply. When I started my doctoral studies in Siegen, many fellows asked me why I, mainly a formal theorist, would choose an advisor with a strong focus on qualitative research and on contextual economics. My answer was that I really longed for acquiring new skills rather than deepening something I was already somewhat adequate at. That was a plan that worked very well due to Nils's extensive expertise and great ability to transfer his knowledge and skills to others. I also thank him for the opportunity to improve several other essential skills. His high but fair requirements for any form of text, teaching and task as well as his exceptional networking skills let my personality grow. Finally, Nils always showed honest interest in his students' issues and ensured a pleasant, yet adequately serious, atmosphere. Given the general increase in dissatisfaction with jobs, this is an aspect I would really like to emphasize.

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Doctoral studies influence the candidate's interaction with the social environment as well. I am grateful that I had a lot of people around me who often encouraged me and showed great curiosity when I talked about my projects. While the list of people I would like to thank is too long, I would like to enumerate the most important ones.

At first, I would like to thank my parents, Marliese and Rüdiger May. They have always supported the decisions I made in the course of my entire studies. This provided me with the basic security every student requires to accomplish goals. Whenever there was some trouble, I could rely on them. Additionally, rather than attempting to lower my expectations, they supported all goals I set myself.

My next thank you goes to Annika. She has given me valuable emotional support and has inspired me to discover new paths for almost the entire journey. Our relationship did not survive the dissertation, but I am convinced the dissertation would not have survived without the relationship either.

In my opinion, there are basically two ways of providing support in difficult situations. The first way comprises attempts to normalize the issue in a sense that it is just normal that a lot of things go wrong. The second approach aims to forget what has happened and to get things done by focusing on the own strengths, no matter what the issues are. While I really appreciate all support, I am especially thankful to the good number of friends that headed for the second way. This preference might be rare, but something like "Marius, why does it take so long for someone like you, go for it" helps me more than a statement like "Well Marius, this is just normal".

Last but not least, I am very thankful for the privilege to have grown up and studied during the era of the "Big Three" in men's singles tennis. What I learned from the Big Three and their closest competitors in terms of grit, resilience and the application of the concept of sunk costs was by far more valuable for the progress of this project than any "good comment" or "constructive advise" provided by (pseudo-)experts in submission processes. Given that a lot of this advice was seemingly built on self-interest (which is rational and thus somewhat acceptable for me) and on opinion rather than on facts (which is not acceptable), I got the impression that, as a singles player in tennis, the doctoral candidate is on his own. Once I discovered a quote by the Irish novelist Samuel Beckett as a tattoo on three-time Grand Slam champion Stan Wawrinka's left arm: "Ever tried. Ever failed. No matter. Try again. Fail again. Fail better". To my mind, this describes doctoral studies excellently. I bet that most tennis players would agree that hard work, grit and resilience pay off in the end. At least, I can confirm that wholeheartedly for the case of my dissertation.

Cologne, August 2023

1 Introduction

1.1 An age of polarization?

Polarization is on the rise. In societies across the globe, different segments of society are pitting themselves against each other, finding fault with others who do not share their group characteristics. And the outcome is, as most people with a social media account can attest, a genuine challenge for civil discourse in democratic societies.

In terms of political economy, polarization shapes relations and affects the interactions within the electorate, between political elites as well as between the electorate and political elites in numerous political discourses. While polarization is not a new phenomenon, its prevalence in the West, in particular, has increased in the last decades. In a comprehensive review of the literature dealing with the political economy of populism, Guriev and Papaioannou (2022) identify polarization as both an important accompaniment and a leading result of populism.

Several studies across different countries and time periods provide evidence that major economic and financial crises lead to polarization (e.g. de Bromhead et al., 2013, Funke et al., 2016 and Algan et al., 2017). The Great Recession from 2007 to 2009 and its consequences serve as a prime example of economic instability providing an opening for populism, with several studies tracing how it led to increased polarization in different countries (e.g. Gidron and Mijs, 2019, Gyöngyösi and Verner, 2020, Garro, 2021 and Dehdari, 2022). Moreover, during the last decade, polarization has increased due to a stronger focus on identity politics and the way in which voters conceive of their own identities. According to Mukand and Rodrik (2018), identity politics is defined as an attempt to alter the voters' perceptions regarding the societal groups to which they belong. Several theoretical approaches explain how identity politics causes polarization (Guriev and Papaioannou, 2022). Gennaioli and Tabellini (2019) show that parties may add political cleavages, such as on cultural views, in order to create social identities endogenously, potentially causing a polarized society. Additionally, the (neo-)cleavage theory (e.g. (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) explains how populist parties introduce a new cleavage, i.e., immigration policies, to polarize the electorate. The aim is to maximize votes. Similarly, Karakas and Mitra (2019) show that identities can result in polarized views on immigration policy within the electorate. Yet, contrary to Gennaioli and Tabellini (2019), they model identities as exogenously given. Other work reveals that voters' beliefs may result in polarization as well. While Levy et al. (2022) show that a lack of information on part of voters can lead to extreme policies, Besley and Persson (2019) provide a theoret-

ical explanation to demonstrate that voters' dynamic beliefs can result in polarized parties.

In a further recent and prominent example, polarization prevailed during the COVID-19 pandemic. Polarization influenced citizens' behavior significantly (Guriev and Papaioannou, 2022). Various studies provide evidence that partisanship shaped both the individuals' reactions to the pandemic (e.g. Allcott et al., 2021, Gadarian et al., 2021 and Canes-Wrone et al., 2020) and their willingness to obey measures mandated by the government in the US (e.g. Cornelson and Miloucheva, 2020 and Milosh et al., 2020). Moreover, the evaluation of the government's performance during the pandemic differed depending on the citizens' political affiliations in the US (Druckman et al., 2021). Finally, as several single-country and cross-country studies illustrate, less polarized societies were more successful in carrying out social distancing (e.g. Bartscher et al., 2021, Brodeur et al., 2021, Durante et al., 2021 and Frey et al., 2020).

The increase in polarization is linked to the rise of social media and digital communication. Both turned out to be a catalyst for polarization (Guriev and Papaioannou, 2022). Furthermore, populist politicians, in particular, can employ social media to increase polarization since digital communication is especially successful in fomenting polarization (Guriev and Papaioannou, 2022). There are several reasons why social media are suitable for engendering polarization. Zhuravskaya et al. (2020) elaborate on various key elements in contributing to polarization, such as low-entry barriers, direct and fast communication, algorithms leading to echo-chambers and a lack of a regulatory framing work, especially addressing the spread of fake news. Bakshy et al. (2015) and Halberstam and Knight (2016) identify echo-chambers for the cases of Facebook and of Twitter, respectively. Additionally, Boxell et al. (2017) determine that, ever since the mass diffusion of social media, political polarization has increased among frequent internet users. Allcott et al. (2021) find that deactivating Facebook accounts decreases political polarization of former users. Finally, social media campaigns and spreading fake news significantly affected the 2016 US presidential elections (e.g. Allcott and Gentzkow, 2017, Vosoughi et al., 2018 and Liberini et al., 2020).

Polarization also contributed to significant changes in voter shares and the emergence of various new parties in numerous European national elections during the 2010s. The Euro Crisis not only caused economic instability in several countries of Southern Europe, but it also led to the decline of governing parties and the rise of populist parties at the same time (Bosco and Verney, 2016, Orriols and Cordero, 2016, Tsatsanis and Teperoglou, 2016, Tsirbas, 2016). Similarly, the refugee crisis and the responses by governments polarized the electorate in several countries of Western Europe and

in Italy (Akkerman, 2018, Chiaramonte et al., 2018, de Vries, 2018, Jesse, 2018, Niedermayer, 2018, Di Mauro and Verzichelli, 2019). This led to changes in the political landscape of these countries. Many parliaments in these countries now feature right-wing populist parties. Most of them have turned to constant political forces even long after the refugee crisis ended.

Besides its extensive effects on political competition and voting behavior, polarization entails several disadvantages. Divided are more prone to suffering from social conflicts (Esteban and Ray, 2011, Montalvo and Reynal-Querol, 2012, Abu-Bader and Ianchovichina, 2019). Plenty of examples from the aforementioned contexts document this insight. Polarization between supporters of the Black Lives Matter movement and supporters of the QAnon movement resulted in violent protests in the United States (e.g. Forberg, 2021). Polarized views on immigration policy caused conflicts in various European countries (e.g. Caiani and Graziano, 2022 and Castelli Gattinara and Froio, 2022). Protests also characterized the split between supporters and opponents of measures to combat the COVID-19 pandemic (e.g. Charron et al., 2022 and Hunger et al., 2023). In addition, polarization undermines social cohesion and trust within societies. These are two ingredients for a well-functioning Social Market Economy (e.g. Goldschmidt and Wohlgemuth, 2004 and Goldschmidt, 2014). Moreover, empirical studies provide evidence that countries with a more pronounced social cohesion achieve higher levels of economic growth (e.g. Ager and Brückner, 2013, Aisen and Veiga, 2013 and Pervaiz and Chaudhary, 2015).

There is abundant evidence of both the increase in political polarization during the last decades and of the negative effects polarization entails. Yet, the aim of this dissertation is neither to show that polarization exists nor to explain its consequences for societal life or economic performance, but rather to investigate how political actors, i.e., politicians and voters, behave under polarization. More precisely, in what follows I examine three different aspects of political behavior. First, I consider the effects of polarized electorates on election results. Second, I investigate politicians' behavior towards polarized voters during election campaigns. Third, I explore the politicization of immigration by different parties in parliaments. There are several other facets of political behavior, e.g. explaining voter turnout under polarization (e.g. Lachat, 2008, Steiner and Martin, 2012, Moral, 2017, Wilford, 2017) or issue selection in campaigns to elicit or deal with polarization (e.g. Aragonès et al., 2015, Dragu and Fan, 2016). I believe, however, that the three topics enumerated above contribute to a better understanding of how voters and politicians behave and interact with each other under polarization. In the following subsection, I elaborate on the different methods used to conduct each of the three parts. Then, I summarize each paper and present novel contributions concerning the approaches and results. Finally,

I identify several key take-aways from the analyses. Importantly, all these main findings stem from more than one of the outlined parts.

1.2 Methods

As outlined above, both political behavior under polarization and polarization in general are multifarious issues. This dissertation deals with different facets of political interaction and employs different methods to approach each individual topic. In the following, I will discuss each method used.

The first two articles analyze the effects of a polarized electorate on electoral results. Rather than showing how the electorate is polarized by, e.g., politicians, polarization is assumed to be exogenous. Notably, these papers analyze the effects on electoral results if polarization prevails, and do not discover situations in which polarizing the electorate can be advantageous for an arbitrary party. The articles thus yield hypotheses that can be tested empirically on the analysis of elections under polarization. This question can be addressed best using formal theory. Contrary to most work focusing on competition incorporating polarization instead of exogenous effects (e.g. Aragonès et al., 2015, Esponda and Pouzo, 2017, Esponda and Pouzo, 2019 and Buisseret and van Weelden, 2020), the articles do not include strategic moves. Consequently, there are no equilibria in which e.g. parties employ a certain policy-agenda to maximize votes given an electorate with specific preferences. The moving parameters ensure that a wide range of different settings can be analyzed empirically using the results of the papers. Instead of explaining certain phenomena or specific results of political competition under polarization, the models as defined provide a much wider scope in which they can be applied.

The third and fourth articles deal with political elites' behavior towards polarized voters during the election campaigns. These studies attempt to shed light on the prevalence of different types of discrimination against voters with certain characteristics. Such research questions are often addressed with field experiments. A large body of literature makes use of field experiments to unveil the effect of a certain individual's characteristic, e.g. gender (e.g. Booth and Leigh, 2010 and Mishel, 2016) or race (e.g. Gaddis, 2015 and Kang et al., 2016) on a specific outcome variable. Specifically, randomized controlled trials (RCT) have been conducted frequently to study whether politicians discriminate against voters with different traits (Costa, 2017). Ever since a seminal paper by Butler and Broockman (2011), a rapidly increasing body of literature has employed RCTs in which emails were sent to officials to examine racial biases (e.g. Distelhorst and Hou, 2014, White et al., 2015, McClendon, 2016 and Einstein and Glick, 2017). The two abovementioned studies in this dissertation follow the same design

and thus contribute to this body of work. Varying a fictious inquirer's ethnic background and the stance on a polarizing issue, these articles are designed to detect different types of motives driving the politicians' behavior towards voters in polarized settings. The results from the experiment are then analyzed employing statistical and econometric methods, a standard procedure for studies of this kind.

The fifth and last article examines the politicization of immigration in parliaments, with evidence stemming from three German state parliaments during the refugee crisis in 2015 and 2016. The politicization of immigration has been examined by a rapidly growing strand of literature (e.g. van der Brug et al., 2015, Grande et al., 2019, Green-Pedersen and Otjes, 2019 Lauwers et al., 2021 and Gessler and Hunger, 2022). Contrary to most of this work, the article included in this dissertation employs qualitative instead of quantitative criteria to measure politicization. Accordingly, the methods used in my study also differ from the majority of work dealing with the politicization of immigration. The article in this dissertation employs qualitative text analysis to approach the underlying issue. More precisely, natural language processing (NLP) methods are applied to speeches delivered by state legislators during parliamentary sessions to detect the politicization of immigration in legislative processes with evidence from German state parliaments. The use of NLP methods has increased fast across several scientific (sub-)disciplines, such as marketing (e.g. Liu et al., 2021 and Zhang and Huang, 2022), healthcare (e.g. Topaz et al., 2020 and Carriere et al., 2021) and political science (e.g. Chatsiou and Mikhaylov, 2020 and Terechshenko et al., 2020). As its wide application suggests, NLP serves as an excellent tool to examine the politicization of immigration with qualitative measures, i.e., based on the language used by state legislators during speeches.

The previous paragraphs demonstrate that this dissertation does not only cover three different topics related to political behavior under polarization, but also that each topic employs a different method. Voting behavior under polarization is examined utilizing methods from formal economic theory. Field experiments and quantitative methods are employed to study political elites' behavior facing polarized voters. Finally, qualitative methods serve to research how politicians politicize a specific issue in the legislative process. This choice is based on the adequacy each approach has for each research question to maximize the validity of the respective results. Consequently, this dissertation can also be considered a reconciliation of different methods within economics. It applies the strengths of each method to the question the method is suited for. Notably, each of these questions is part of a bigger issue. In this manner, the approach adopted here reveals how the acceptance of different methods in economics can proceed in a fruitful way.

1.3 Summary of the different papers

In the following, all five papers included in the dissertation are summarized. The articles are clustered by the topic they can be assigned to.

1.3.1 Retrospective voting behavior under polarization

The first paper develops and analyzes a behavioral public choice model which comprises two elections and three blocs of parties. The blocs include the government, the parliamentary opposition and the extra-parliamentary opposition. Voter types are assigned to the respective choice in the first election. In line with empirical studies (e.g. Plescia and Kritzinger, 2017, Plescia, 2017, Stiers, 2018, Stiers and Dassonneville, 2020), voters evaluate the performance of the government and the parliamentary opposition retrospectively before the second election. The performances can each be perceived as either satisfying or dissatisfying. The probability of being satisfied with the performance of each bloc is voter type specific. Between the first election and the second election, a polarizing event takes place. As suggested by literature on retrospective voting (e.g. Achen and Bartels, 2004 and Achen and Bartels, 2016), this event may be fully, partially or entirely not under the control of the government. Voters of each type may be polarized in different directions. Negatively polarized voters feature a lower probability of being satisfied by the government, whereas positively polarized voters have a higher probability of being content with the government compared to non-polarized voters. Moreover, voters are subject to the negativity bias. This implicates that voters are more focused on the negative than the positive. Thus, the change in probabilities of being satisfied with the government is more pronounced for negatively polarized voters compared to positively polarized voters. Voters employ satisficing to decide what party bloc to vote for in the second election. For this purpose, satisficing is extended to a decision rule that can capture more than one evaluation. Voters stay with the bloc from the first election if this bloc satisfies and shift to another bloc otherwise. In an extension, non-voting is introduced. Voters can abstain from voting if they are dissatisfied with both the government and the parliamentary opposition. The extended satisficing rule allows for this kind of decision-making without further assumptions.

The analysis is based on the comparison between the expected voter shares from the second election and a presumed second election without polarization, i.e., if the polarizing event would not have taken place.

The basic model including three party blocs shows that the government can only profit from polarization in expectation if the ratio of positively and negatively polarized voters exceeds the negativity bias. Since the negativ-

ity bias is larger than one, the government requires unambiguously more positively than negatively polarized voters to enjoy expected gains under polarization. In contrast to that, the parliamentary opposition and the extra-parliamentary opposition benefit from polarization if and only if the ratio of positively and negatively polarized voters is lower than the negativity bias. Furthermore, these two blocs are unequivocally better off with a higher negativity bias. If these two blocs profit from polarization the probability that the parliamentary opposition satisfies voters will determine what bloc obtains larger gains in expectation. In case the parliamentary opposition satisfies voters with a high probability, it is able to entice a lot of dissatisfied voters due to polarization. If the parliamentary opposition is per se not an attractive option, depicted by a low probability of satisfying, voters are more likely to be dissatisfied with both the government and the parliamentary opposition. This leads to more pronounced increases for the extra-parliamentary opposition. A strong parliamentary opposition will also ensure less pronounced losses for the government if polarization favors the opposition blocs. The government's chance to satisfy voters is also relevant for the expected effects of polarization. On the one hand, a weak government is less harmed by too many negatively polarized voters. On the other hand, if the ratio of positively and negatively polarized voters exceeds the negativity bias, a convincing government is able to capitalize even more on polarization.

If non-voting is included, the effects on the "non-voting bloc", which is, intuitively, complementing the voter turnout, are the same as for the extra-parliamentary opposition. Consequently, voter turnout drops whenever the ratio of positively and negatively polarized voters is lower than the negativity bias. If this condition is met, more voters are discontent with the parliamentary blocs in expectation. This mechanism decreases voter turnout. Similarly to the basic model, the strength of the parliamentary opposition determines the magnitudes of voter shifts, also for non-voters. Convincing parliamentary opposition entices a larger share of voters dissatisfied with the government and thus diminishes the negative effects on voter turnout. Additionally, negative effects on voter turnout are pronounced for a per se strong government. Intuitively, a weak government would not be attractive for voters even without polarization and thus entails more dissatisfied voters who abstain as a result.

The insights from this paper provide testable hypotheses on how polarizing events affect election results. A natural choice to test the results are elections in light of the refugee crisis in Western Europe or elections in the aftermath of the Euro Crisis in Southern Europe. It is worth noticing that many parameters are not fixed, e.g. the numbers of differently polarized voters, the chances of satisfying voters and the negativity bias. Therefore,

the model is suitable to explain different patterns within the prementioned elections. One example is the degree to which the parliamentary opposition gained compared to the extra-parliamentary opposition. While the parliamentary opposition achieved far fewer gains than the extra-parliamentary opposition in the national election in Germany in 2017, the absolute gains of these two blocs were almost equal in the Greek national elections in 2015. Moreover, differences in losses of shares for the government can be explained in several ways. First, the ratios of positively and negatively polarized voters can differ. Second, the chances to satisfy voters can vary across elections. Third, electorates in different countries feature varying magnitudes of the negativity bias. Notice that the negativity bias is a characteristic not stemming from politics, underscoring that factors from other areas influence political behavior. This insight corroborates contextual approaches to study voting behavior, especially under polarization.

The second paper builds on very similar assumptions as the first paper. The key difference is that the three-party setting does not comprise an extra-parliamentary opposition, but so-called "profiteers". This bloc contains opposition parties, independent of parliamentary status, that cannot be worse off due to polarization in favor of or against the government. Contrary to the extra-parliamentary opposition in the first study, profiteers can also satisfy and dissatisfy voters. Using e.g. special campaigns addressing the polarizing event, profiteers feature a higher chance to satisfy voters who are polarized against the government. As in the first paper, the extension introduces non-voters and abstention.

The analysis of this setting provides several additional insights. The government has to offset not only the deteriorating effect of the negativity bias but also a strengthened profiteer bloc in light of polarization. While the opposition's chances of satisfying voters are neither affected by polarization in this study, its potential to capitalize on voters discontent with the government is hampered by increased competition from strengthened profiteers. Profiteers are more likely to profit from polarization if their chances of satisfying voters are low without polarization. The analysis of the introduction of non-voting yields significantly different results to the first study. In the first study, the competitiveness of the parliamentary opposition determines the sizes of voter shifts significantly. In the second study including a profiteer bloc, the chances of satisfying voters of the parliamentary opposition do not influence whether a specific bloc profits from polarization or not. This result stems from the fact that polarization does not affect the competitiveness of the parliamentary opposition. Consequently, its role is less important in the second article than in the first article. Finally, polarization enables the profiteer bloc to convince more discontent voters. This induces less pronounced expected decreases in voter turnout if many voters

are polarized against the government. Intuitively, there is a larger number of voters that are discontent with all parties in case the share of voters polarized against the government is very high. This mechanism is counteracted to some extent by the mobilization of strengthened profiteers in the presence of polarization. This effect prevails especially for per se weak profiteers.

Assuming a profiteer bloc instead of an extra-parliamentary opposition that cannot satisfy voters by definition thus yields different results. In addition, it opens up other areas of application. The modified model in the second paper provides several approaches to explain voter shifts in election results in light of polarization. This especially applies to settings where a certain party attempted to entice voters polarized against the government. In these settings, the competitiveness of the government and of the profiteers plays a far more important role than the strength of the parliamentary opposition. Empirical studies based on this article may show that especially strong governments and poor profiteers lead to pronounced effects as predicted. Examining the profiteers' role can also be interesting from another point of view. They unambiguously profit from more voters polarized against the government. In practice, profiteers may achieve this with polarizing campaigns. While such polarization is generally considered detrimental, there is at least an effect from increased mobilization that diminishes potential decreases in voter turnout. Backing up this hypothesis with empirical evidence is another subject for future work.

1.3.2 Politicians' behavior facing requests by polarized voters

The third paper of the dissertation is on a field experiment Ekkehard A. Köhler and I conducted. Ekkehard Köhler contributed 30 % to the article and I contributed 70 % to it. The RCT is registered at the American Economic Association[1] and is IRB approved[2]. In this study, we examine whether racial discrimination or vote maximizing behavior explains variances in legislators' responsiveness if they face a racially charged question in a polarized setting. Therefore, we contacted 4094 state legislators whose seats were up for election prior to the US 2020 elections via email with fake Gmail accounts and names. The study comprises two treatments which both consist of two dimensions. The first treatment varies the inquirer's race. While the name Matthew Mueller suggests that the inquirer is white, the name DeShawn Jackson implies that the sender is black. The second treatment is the inquirer's stance on Black Lives Matter (BLM). The email contains a clear indication of whether the inquirer supports or opposes BLM. All emails request data on police violence fatalities in the legislator's district.

[1] AEA RCT Reg. Nr: AEARCTR-0006599. Registration Date: October 16, 2020 11:23 AM

[2] IRB approval ER_26/2020 University of Siegen

Most related studies examining racial discrimination by political elites find a racial bias against black inquirers (e.g. Butler and Broockman, 2011 and Butler et al., 2012). A meta-study conducted by Costa (2017) shows that across these studies, there is a robust racial bias against blacks. Thus, we expect racial discrimination to prevail in our study as well. This implies a significantly lower response rate for the black inquirer.

In addition, we expect that several effects hinting at vote maximizing behavior by incumbents explain variances in responsiveness. According to several studies, BLM and police violence are a polarized issue with different stances represented by Democrats and Republicans (Tesler, 2016, Drakulich et al., 2020, Updegrove et al., 2020 and Reny and Newman, 2021). In line with this literature, we expect that the Democrats' response rate is significantly higher towards inquirers supporting BLM compared to inquirers opposing BLM. Analogously, we expect that the Republicans' response rate is significantly higher towards BLM supporters compared to BLM opponents. Additionally, strategic information transmission suggests that legislators have an incentive to send the requested information on police violence if it matches the stance of their party (see, e.g., Crawford and Sobel, 1982). Therefore, we expect a higher response rate by Democrats in districts in which Blacks are disproportionately killed and by Republicans where Blacks are not disproportionately killed. Legislators in districts without any black or white fatalities serve as the baseline in both cases. Finally, we suggest that the salience of the issue police violence and BLM can explain variances in responsiveness. Salience is measured by Google Trends data. The topic "Blacks" provided by Google Trends comprises both the terms "BLM" and "police violence". Several theoretical studies on electoral competition assume that different issues feature different levels of importance within an election (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). Following this assumption, legislators have a higher incentive to answer requests on police violence if the topic "Blacks" is more salient. Thus, we expect that the response rate of incumbents of both parties increases in the salience of the topic "Blacks". The focus on strategic information transmission and on salience are new contributions to the literature.

We achieved a response rate of 31.4 %. Compared to similar field experiments, this response rate is relatively low (Costa, 2017). This is a striking finding because the issue of the inquiry featured in the experiment, police violence and BLM, was very salient prior to the US elections in 2020. The polarization within this issue may serve as an explanation. There is evidence that political elites are less responsive facing requests that contain questions about policies compared to service questions, especially if they disagree with the inquirer (Butler et al., 2012). Yet, addressing voters' thoughts, opinions

and questions is a fundamental task for representatives. The evidence from this experiment hints at an insufficient effort by incumbents in this regard.

Our results do not yield evidence to conclude the existence of a racial bias against Blacks in the context of the experiment. The response rates by legislators of both parties were only slightly higher towards the white inquirer compared to the black inquirer. We neither find that Blacks receive a higher response rate compared to Whites, which is highlighted by some literature (e.g. Einstein and Glick, 2017). Consequently, our results suggest that there is no racial bias in any direction in our experiment. While racial biases cannot explain variances in responsiveness in our setting, aspects hinting at vote maximizing behavior by incumbents yield several insights.

We find that Democrats answer significantly more often to BLM supporters compared to BLM opponents. Furthermore, the Republicans' response rate is higher towards BLM opponents compared to BLM supporters, yet not significantly higher. Thus, we cannot reject the hypothesis that there are partisanship effects in the context of police violence and BLM, especially for Democrats. These results suggest that this issue was polarized in the preface of the US elections in 2020 as outlined by the literature (Tesler, 2016, Drakulich et al., 2020, Updegrove et al., 2020 and Reny and Newman, 2021). Moreover, we provide evidence confirming the hypothesis that a polarized electorate can lead to a polarized political landscape, as Jones et al. (2022) suggest. This hypothesis from theoretical political economy builds on double-peaked voter preferences and is an alternative approach to the standard Downsian framework.

Additionally, we find evidence to conclude that incumbents employ strategic information transmission. In case the statistic on police violence fatalities supports the legislator's bipartisan stance on BLM, we observe a significantly higher response rate compared to legislators from districts with no white or black fatalities. This is evidence to conclude that incumbents utilize requests to maximize votes by providing information that enhances the chances of being elected. Contrary to partisanship effects, this aspect of vote maximizing behavior does not depend on the inquirer's ideology, but on the characteristics of the voting district. This analysis thus suggests that strategic information transmission should always be considered disentangling partisanship effects and racial discrimination.

Finally, we find that response rates by incumbents of both parties increase in the salience of the topic "Blacks". The effect is more pronounced for Democrats. This is evidence to conclude that political elites monitor what issues are trending in their electorate. Based on this information, incumbents adopt their response behavior and tend to reply more frequently if the

issue of the inquiry is important. This aspect also implies vote maximizing behavior by legislators. The result has two other implications. First, it reinforces the assumption of an increasing number of theoretical studies on elections that the salience of an issue determines the candidates' behavior (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). Second, the study provides evidence from a field experiment supporting the insight that the electorate creates salience, which changes the communication by political elites (Helbling and Tresch, 2011, Wagner and Meyer, 2014, Klüver and Sagarzazu, 2016, Stier et al., 2018 and Dennison and Geddes, 2019). Older literature suggests that political elites define the most important issues themselves (Petrocik, 1996 and Petrocik et al., 2003). We also find that legislators are more likely to employ strategic information transmission as defined above if the topic "Blacks" is more salient.

The article provides several insights from a field experiment conducted before the US elections in 2020 on legislators' behavior confronted with a polarized issue. While we do not find any evidence of a racial bias against Blacks in the context of our study, several results suggest vote maximizing behavior by incumbents. This implies that statistical discrimination instead of taste-based discrimination explains differences in responsiveness. Consequently, not the inquirer's socio-demographic traits, but both the inquirer's and the incumbent's stance on a polarized issue shape the incumbent's response behavior. Overall, the evidence of vote maximizing behavior suggests that such incentives should always be considered examining the communication between voters and candidates in a polarized setting. Furthermore, the findings support theoretical predictions that bimodal preferences within the electorate lead to polarized candidates in a two-party setting. Jones et al. (2022) show that strategically minded candidates in a two-party competition do not converge to the median voter preference in case voter preferences are not single-peaked but bimodal. Thus, in the age of polarization, the median voter theorem by Downs (1957) has to be revisited with more scrutiny. The results from our experiment do not provide evidence against this theoretical hypothesis.

The fourth paper of the dissertation also comprises a field experiment executed by Ekkehard A. Köhler and me. Ekkehard Köhler contributed 30 % to the article and I contributed 70 % to it. As the field experiment ahead of the US elections in 2020, this RCT is registered at the American Economic Association[3] and is IRB approved[4]. We fielded this experiment in the forefront of the German national elections in 2021. We contacted 1554 candidates from the six parties represented at that time in the German

[3]AEA RCT Reg. Nr: AEARCTR-0008024 July 31 2021
[4]IRB approval ER 30/2021 July 27 2021 University of Siegen

Bundestag and of the party "Freie Wähler" from Bavaria. The latter party is part of the governing coalition in Bavaria. Again, we used fake Gmail accounts and names. Contrary to the other experiment, we conveyed that we were high school students and first-time voters in the email. First-time voters constitute an important group for political elites as these can evolve into long-term supporters. Moreover, we conducted two campaigns. In the first campaign, we employed three treatments with each two dimensions. The first treatment varied the inquirer's migration background in a binary manner. The second treatment varied the inquirer's binary gender. The third and last treatment varied the inquirer's bipartisan stance on dual citizenship, which could be either in favor or against it. Accordingly, the email asks for the candidate's stance on dual citizenship. In the second campaign, we included only two treatments with each two dimensions. Again, the first treatment distinguishes between an inquirer with migration background and an inquirer without migration background. The second treatment varied the inquirer's stance on compulsory vaccination against COVID-19 for teachers, signaling a preference in favor or against compulsory vaccination. Similarly to the first campaign, the inquirer requests the candidate's opinion on compulsory vaccination for teachers. Compulsory vaccination for teachers was a controversial issue ahead of the elections and plays an important role for high school students.

Similarly to the previous study, this article investigates whether racial biases or vote maximizing behavior explain differences in the candidates' responsiveness. An advantage of the approach entailing two campaigns with different issues in the inquiry is that it allows to check for effects that stem from the context of the inquiry. While the issue of the first inquiry, dual citizenship, is related directly to migration, the issue of the second inquiry, compulsory vaccination, has at most little to do with migration. Since this study is a short paper, we constrained ourselves to two hypotheses. The first hypothesis is that inquirers with migration background receive a significantly lower response rate by candidates of the right-wing AfD compared to inquirers without migration background in both campaigns. This hypothesis corresponds to the first hypothesis from the third paper on the field experiment ahead of the US 2020 elections. Related studies show that right-wing politicians feature a stronger inter-ethnic bias. Importantly, we expect the bias to prevail in both a migration-related and a non-migration-related context. The second hypothesis suggests that inquirers receive significantly longer answers if the candidate disagrees with the inquirer on the underlying issue compared to candidates who agree with the inquirer. This hypothesis supposes vote maximizing behavior by candidates and can be justified in two ways. First, rational choice suggests that a vote-maximizing candidates are incentivized to elaborate more on an issue to convince the inquirer of their point of view. Second, information economics suggests that a candidate will

obfuscate information for a receiver strategically in case the information is unfavorable for the receiver (e.g. Hao et al., 2001, Dewan and Myatt, 2008 and de Clippel and Rozen, 2020).

We find that inquirers with migration background receive a significantly lower response rate by AfD candidates only in the first campaign. Inquiries deal with dual citizenship in this campaign, which is a migration-related issue. In the second campaign, inquirers with migration background receive a higher response rate by AfD candidates. However, the difference is not significant. This campaign features requests on the candidate's stance on compulsory vaccination. This issue is considered non-migration-related. Thus, hypothesis one can only be confirmed for a migration-related context.[5]

Concerning hypothesis two, we find that in the first campaign, candidates favoring dual citizenship spend significantly more words replying to inquirers against dual citizenship compared to inquirers favoring dual citizenship. Candidates opposing dual citizenship feature longer answers to inquirers supporting dual citizenship compared to inquirers opposing dual citizenship, yet the difference is not significant. In the second campaign, candidates opposing compulsory vaccination for teachers spend significantly more words facing a supporter of compulsory vaccination compared to opponents of compulsory vaccination. Candidates in favor of compulsory vaccination spend more words answering requests by opponents of compulsory vaccination compared to supporters of compulsory vaccination, but the difference is not significant. Therefore, we can confirm hypothesis two partially for each campaign and do not find evidence against vote maximizing behavior by candidates. We find significant differences in the average length of responses if the candidate favors the more popular opinion on the underlying issue. Popularity is measured by the share of candidates supporting a specific stance on an issue in this context.

The article finds several new insights on candidates' behavior being confronted with polarized first-time voters with different migration backgrounds. The evidence from the experiment ahead of the German national elections in 2021 suggests that right-wing candidates only discriminate against voters with migration background if the issue of the inquiry deals with migration. This result is insightful because politicians should serve citizens, irrespective of the issue of conversation and socio-demographic traits. The analysis provides evidence that, at least for right-wing candidates and voters with migration background, this does not always apply. Moreover, this finding

[5]We also conducted an analysis on the prevalence of racial discrimination by the candidates of other parties. Across all other parties, there is no significant difference in response rates towards inquirers with migration background and inquirers without migration background. This applies to both campaigns.

implies that discrimination against voters with migration background is a contextual phenomenon. As a result, the analysis indicates that the context of the communication between polarized voters and political elites has to be considered in the design phase of the experiment. The candidates' behavior may change according to the nature of the issue. In addition, examining the length of answers provides evidence of vote maximizing behavior. Candidates who disagree with the inquirer spend more words than candidates who agree with the inquirer as expected. Contrary to the hypotheses on strategic information transmission and salience from the third paper, this kind of vote maximizing behavior is not a certain characteristic of the candidate's district. In the case of this study, vote maximizing behavior is solely based on endogenous factors, i.e., both the inquirer's and the candidate's stance on the underlying issue. Another difference is that this study focuses on the average length of replies and not on the observation whether a reply was given or not. Consequently, this article also has a broader implication on how vote maximization should be considered in field experiments like the experiment presented in this paper. It is not only worthwhile to analyze whether a politician answers, but also how the politician answers in the examination of vote maximizing behavior.

1.3.3 Politicians' behavior in parliaments

The fifth and last paper of the dissertation deals with the question of how legislators communicate the issue immigration in parliaments. The evidence stems from Green and AfD legislators in the state parliaments of Saxony, Thuringia and Brandenburg from parliamentary sessions between August 10, 2015 and March 31, 2016. A rapidly increasing strand of literature examines how political elites politicize immigration (e.g. Hutter and Grande, 2014, Meyer and Rosenberger, 2015, Grande et al., 2019, Mendelsohn et al., 2021 and Gessler and Hunger, 2022). According to van der Brug et al. (2015), an arbitrary issue is politicized if it is (i) salient and (ii) polarized in terms of conflicting opinions between parties. Contrary to other literature on how immigration is politicized, most recent studies (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022) find that radical-right or right-populist parties politicize immigration. The study included in the dissertation contributes to the literature on the politicization of immigration in two ways: First, it examines whether legislators also politicize immigration in parliaments. While most related work employs manifestos or news as a data basis (e.g. Hutter and Grande, 2014, Meyer and Rosenberger, 2015, Grande et al., 2019, Mendelsohn et al., 2021 and Gessler and Hunger, 2022), this study covers speeches from parliamentary sessions. Second, both dimensions of politicization, i.e. salience and polarization, are measured qualitatively using NLP. This is different from related work that uses quantitative criteria to measure both salience and

polarization (e.g. Hutter and Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022).

The selection of the parliaments comes from the parliamentary status both the right-wing AfD and the Greens had in the considered time span. The AfD did not enjoy parliamentary status in the German Bundestag at that time. In addition, the period from August 10, 2015 to March 31, 2016 accounts for a very charged time during the refugee crisis. While there is, to the best of my knowledge, no absolute definition for the peak of the crisis in Germany, this period contains important events within the crisis (see, e.g., Franzmann, 2019). August 10, 2015 marks an important date in the early stages of the crisis as a huge wave of refugees arrived in the time following that day. Moreover, on March 18, 2016, the European Union and Turkey signed the meaningful EU-Turkey readmission agreement, mitigating larger migration into Europe from that point on (Haller, 2017).

In line with recent studies on the politicization of immigration (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022), I assume that AfD legislators politicized immigration in the considered parliaments and time span. Following the definition of politicization by van der Brug et al. (2015), I establish the following two hypotheses: The first hypothesis is that AfD legislators' speeches in all states comprising the issue immigration also deal with issues not directly related to immigration. Furthermore, Green legislators' respective speeches in all states only deal with immigration-related issues. This hypothesis suggests that AfD legislators increase the salience of the issue immigration by linking it to other issues during speeches. Due to these connections, the importance of immigration is emphasized. The second hypothesis suggests that AfD legislators' sentences dealing with immigration reveal a frame of threats in all states and that the respective sentences by Green legislators show frames of victims and heroes in all states. The different frames of immigration stated in the second hypothesis stem from a definition by Benson (2013). This definition is also used in other related literature (e.g. Hovden and Mjelde, 2019 and Mendelsohn et al., 2021). Both hypotheses are tested using the NLP method LSI models. A fast growing body of literature employs NLP to, e.g., examine political communication (e.g. Takikawa and Nagayoshi, 2017 and Cabot et al., 2020).

Analyzing the speeches in which AfD legislators talk about immigration shows that these incorporate several other issues in these speeches, e.g. state politics, international relations and democracy. This especially pertains for the state legislative sessions in Thuringia and Brandenburg. On the contrary, speeches held by the Greens do not deal with other issues than immigration apart from an issue related to administration in Thuringia.

This is evidence that AfD politicians attempted to increase the salience of immigration in parliaments during the time span in concern putting immigration into context to other issues in their speeches. This does not apply to the Greens. Therefore, the first hypothesis is confirmed. If salience was measured quantitatively by, e.g., comparing the share of speeches dealing with immigration, there would be very small differences in the attempt to increase salience of immigration between the two parties because the shares do not differ much.

I find that in sentences containing the issue immigration, AfD legislators frame immigration as a fiscal threat or as a threat to public order. The LSI models do not reveal other frames from the definition by Benson (2013). The frames prevail most in Saxony. This is evidence of a negative frame for immigration. On the contrary, the sentences in which Green legislators address immigration reveal that these frame immigrants as victims of discrimination across all states and as heroes in a sense that integration works well in Brandenburg. Consequently, if frames comprised by the definition of Benson (2013) are applicable, these are positive frames. Combining the results, the second hypothesis can be confirmed. AfD legislators use negative frames, whereas Greens employ positive frames talking about immigration. This is evidence of polarization between the two parties in scope.

The examination of the two hypotheses implies that the AfD raised the salience of the issue immigration in state legislative sessions in Saxony, Thuringia and Brandenburg. Furthermore, there was polarization between the right-wing AfD and the Greens regarding immigration. As a result, the study yields evidence that the AfD increased the politicization of immigration in state parliaments during peak times of the refugee crisis in Germany. These results are in line with literature claiming that immigration is politicized by right-wing parties (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022). The study corroborates this strand of literature with two new contributions. First, data from parliaments, a source scarcely used, constitutes the data set. Second, politicization is measured qualitatively using NLP methods. Interestingly, if quantitative measures were applied (as, e.g., Hutter and Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022), both parties would spend equal efforts to increase the salience of the issue immigration. This would not confirm hypothesis one and lead to the conclusion that both parties politicized immigration equally. Therefore, the study shows that qualitative measures for politicization can show different results, at least in this context. To sum up, the results indicate that both the new source of data as well as the qualitative measures for politicization are valuable approaches for similar research questions.

The findings in the study are also in line with theoretical approaches on how specific parties deal with certain issues to maximize votes. Literature on the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) and on the issue entrepreneurship theory (e.g. Hobolt and de Vries, 2015 and Buisseret and van Weelden, 2020) suggests that the AfD, a relatively new party at that time, had an interest in increasing the salience of the issue immigration to gain support within the electorate. Given the important role salience plays in the analysis, theoretical work on electoral competition that includes salience is supported (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). Finally, the different frames used by legislators of different parties can also be interpreted as a reaction to the critical role immigration played in the electorate at that time. Thus, the results also contribute to the body of literature claiming that an increase in the salience of an issue within the electorate induces changes in politicians' communication (Helbling and Tresch, 2011, Wagner and Meyer, 2014, Klüver and Sagarzazu, 2016, Stier et al., 2018 and Dennison and Geddes, 2019).

1.4 Major take-aways from the dissertation

In this subsection, I elaborate on various overarching results that stem from different papers included in the dissertation. Moreover, further questions based on these results are raised.

1.4.1 Polarization matters

The finding that polarization matters may not be surprising at all, given the abundant literature on the effects polarization has on numerous aspects of political agents and interaction. This dissertation extends the field of effects and substantiates important strands of studies. As derived in the first two papers, the more polarizing an event is, the more pronounced are the effects. Notably, the number of voters polarized in favor or against the government determines whether polarization is beneficial in expectation for parties or not. This outcome reinforces the role of polarization as a tool for parties to maximize votes. A government that suffers from polarization in expectation is incentivized to increase the cohesion in the electorate. This aspect supports work that focuses on the design and implementation of cohesion programs. Given the prevalence of polarization across countries, such programs might be implemented on higher levels, e.g. the European Union (e.g. Dörr et al., 2019). If polarization is profitable for the opposition in expectation, there will be strong incentives to increase the degree of polarization to make voters even less likely to be satisfied with the government. Another strategy can be to address certain voters that may be prone to be polarized in a specific direction. This points at the essential role of politi-

cians' communication towards voters and how politicians frame issues (e.g. Porto, 2007, Slothuus and de Vreese, 2010, Hullman and Diakopoulos, 2011, Elias et al., 2015, Vliegenhart et al., 2016). The results also underscore the role of spreading fake news and fact-checking, which can be employed to elicit or to combat polarization, respectively (e.g. Riedel et al., 2017, Tucker et al., 2018, Zhang and Ghorbani, 2020 and Wintersieck, 2017, Hameleers and Meer, 2020, respectively). In a broader sense, the influence of fake news on political competition suggests that this area requires a proper regulatory framework. This research subject is examined in contemporary literature (e.g. Schnellenbach, 2018 and Hartley and Vu, 2020).

The third and fourth papers of this dissertation contain field experiments in which polarized voters contact political elites to gather information or opinions on controversial issues. The feature that voters are polarized depict polarized preferences within the electorate, as assumed by, e.g. Jones et al. (2022). As outlined above, Jones et al. (2022) predict that given these preferences, two strategically-minded candidates also take polarized positions. This is an important contrast to the assumption of single-peaked voter preferences, as suggested by Downs (1957) and subsequent work. Single-peaked preferences induce candidates to converge to the median voter preference in two-party-competition. The results from both the third and the fourth papers suggest that polarization within the electorate affects the response behavior by political elites. The evidence from the experiment prior to the US 2020 elections does not contradict the theoretical prediction by Jones et al. (2022). First, legislators will tend to respond more frequently if the inquirer agrees with them on the issue BLM. Second, the response rate is significantly higher if the local statistic on police violence fatalities is in accordance with the legislator's bipartisan stance on BLM. Moreover, the results from the experiment ahead of the German national election in 2021 suggest that the inquirer's stance on a polarizing issue affects the length of replies.

This evidence shows that polarization within the electorate affects political elites' interaction with voters and implies that the effects of the politicians' reactions have to be examined. The results from the third paper suggest that legislators, confronted with polarized voters, may strengthen the voters' polarization with their response behavior. The role both the voter's stance and the statistic on police violence fatalities play indicate that voters are more likely to receive an answer which is in line with their own stance. Thus, the field experiment raises the question how polarized candidates affect polarization within the electorate. This is an alternative approach to the work by Jones et al. (2022) who examine how a polarized electorate influences polarization between two competing candidates. Put differently, not only the effect of polarized voters on candidates should be considered, but also

subsequent effects. Additionally, field experiments featuring polarized voters can also include non-polarized voters who do not express any opinion on a polarized issue. Comparing the response behavior to polarized voters to the response behavior towards non-polarized voters yields even more precise insights about the effect of polarized voters on political elites.

Finally, polarization can also play a significant role in political debates in parliaments. As shown in the fifth paper of the dissertation, there was clear polarization between Green legislators and AfD legislators regarding the issue immigration in parliamentary sessions during the refugee crisis in Germany. The framework by van der Brug et al. (2015) suggests that political polarization is one aspect of politicization. In this sense, the study provides evidence that AfD legislators elicited polarization strategically to politicize immigration and consequently to gain support within the electorate. The (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) suggests this behavior. Thus, vote maximizing motives should always be considered in the context of polarization.

1.4.2 Different voters, different results

This dissertation provides elaborate evidence that voters' characteristics should always be considered when examining political interactions under polarization. Concerning the first two papers of the dissertation, this insight prevails due to several aspects. Different directions of polarization are key to analyze the effects of polarization on election results. More importantly, the negativity bias both determines whether polarization is advantageous for parties or not and affects the magnitude of voter shifts in expectation. Therefore, electorates more focused on the negative lead to more pronounced effects of polarization on election results. This finding is intriguing because of two reasons. First, the negativity bias is a psychological characteristic and as such not directly related to voting behavior, as, e.g., preferences. Voters thus react differently to polarizing events on an individual level due to their psychological traits. Second, this implies that, even though the numbers of voters polarized and the degree of polarization might be similar comparing two elections under polarization, differences in the negativity bias can lead to fundamentally different results. These differences are caused by the voters' characteristics and not by political interaction. In a broader context, this result implies that politicians should aim to increase the electorate's resilience if they want to mitigate the effects of a polarizing event. Intuitively, resilient voters are less prone to the negativity bias and are thus less affected by polarization against the government. This leads to lower effects on election results.

As outlined in the previous subsection, voters with different characteristics cause differences in politicians' response behavior. Many studies comprising experiments (e.g. Butler and Broockman, 2011, Butler et al., 2012, McClendon, 2016 and Einstein and Glick, 2017) focused on effects of voters' socio-demographic traits, mainly race. This dissertation also provides evidence of the effects of voters with polarized stances on controversial issues. The results from the field experiments show mixed evidence of the prevalence of racial discrimination against voters. Thus, the prevalence of discrimination due to socio-demographic characteristics is limited within these articles. The voter's ideology plays a much more important role explaining the response behavior by candidates in these studies instead. This provides evidence that ideology should always be considered in such field experiments. This is especially true if the experiments feature polarized issues and if there is room for politicians to follow vote maximizing incentives as in the experiments in this dissertation.

Additionally, the analyses from the experiment ahead of the US 2020 elections show that the salience of the issue covered by the inquiries drives the legislators' responsiveness. This suggests that it is key to observe what issues are trending in the electorate when the political interaction between politicians and voters is examined. Salience is measured by Google Trends Data in the experiment and thus provides insights on how important an issue is relative to other issues or how present an issue is across different electorates. Therefore, this measure of salience reveals what voters consider essential and not what political elites try to push in public debates. As outlined above, the study consequently implies that voters create salience and that politicians react in line with the importance of issues within the electorate. This supports several studies on the role of salience in the interaction of politicians and voters (e.g. Hagemann et al., 2017, Barberá et al., 2019 and Hobolt and Wratil, 2020). Moreover, the results provide evidence that politicians monitor the salience of issues within the electorate. Thus, if politicians' behavior in electoral competition is examined, the electorate should also be considered as it affects politicians' behavior significantly by focusing on different issues.

Not only how important voters consider the issue in scope affects political elites' behavior, but also their preferences on this issue. The experiment before the US 2020 elections features voters with polarized preferences on the issue BLM and police violence. This assumption is not in line with single-peaked voter preferences. These preferences are the core of the framework by Downs (1957), of the median-voter theorem and of numerous studies building on the framework by Downs (1957). Jones et al. (2022) predict that candidates do not converge to the median voter preference facing polarized

voter preferences. The evidence from the experiment does not contradict this theoretical hypothesis. This suggests that the prevalence of polarization between candidates may also be attributed to polarization within the electorate. Therefore, an in-depth analysis of political polarization should always consider the voters' preferences. In a broader context, it is interesting to examine who is polarized first, either voters or politicians, even if the answer is that this question is a chicken-and-egg problem.

1.4.3 Rational choice is not dead

The first two papers of this dissertation build on behavioral public choice models with many insights from behavioral economics to explain voting behavior. This strand of literature aims at explaining various phenomena in political economy and grows rapidly, as summarized in a survey by Schnellenbach and Schubert (2015). This literature provides different explanations for these phenomena compared to standard rational choice work and challenges the results provided by rational choice theory. Thus, the results from the first two studies of the dissertation offer hypotheses how polarization within the electorate affects election results from a behavioral public choice perspective. Notably, the papers remain silent on how parties or candidates interact with voting behavior as assumed in these studies. Given the evidence from the other three studies in the dissertation, it may be fruitful to consider political elites as vote maximizing and therefore rational players as outlined by rational choice theory.

Both the third and fourth paper of this dissertation establish hypotheses on political elites' response behavior to voters with different characteristics. However, the different hypotheses within each paper hint at different directions. In line with the majority of field experiments which explore racial discrimination in the interaction of political elites with voters (e.g. Butler and Broockman, 2011 and Butler et al., 2012) and a meta-study by Costa (2017), we assume that politicians discriminate against minority voters. This hypothesis is in line with taste-based discrimination (e.g. Guryan and Charles, 2013 and Bertrand and Duflo, 2017) and, revealing the prevalence of a bias that is not related to vote maximization, not in line with rational choice theory.[6] All other hypotheses rely on the theory of statistical discrimination (e.g. Becker, 1957). Partisanship effects, strategic information transmis-

[6]The reasoning that lower responsiveness towards minority voters is evidence of a racial bias and thus for racial discrimination is not undisputed. One might also argue the observation that cosmopolitan politicians answer more often to minority voters compared to conservative or right-wing voters is evidence of vote maximization. This argument implies that minority voters are more likely to vote for cosmopolitans. Intuitively, politicians serve their supporters as they do if they answer more often to voters with similar stances on issues. Moreover, as discussed by e.g. Arrow (1998), a clear distinction between taste-based and statistical discrimination cannot always be made in practice.

sion and accounting for salience are facets of vote maximizing behavior and therefore in support of rational choice.

The experiment ahead of the US 2020 elections yields that neither Democrats nor Republicans have a racial bias against black inquirers. This finding implies the absence of taste-based discrimination, which has been found in the meta study by Costa (2017). Notably, this insight is limited to a racial bias against Blacks in the context of the experiment. On the contrary, there is abundant evidence of legislators who attempt to maximize votes in different ways within the experiment.

As mentioned in the summary of the third paper, we find partisanship effects in our experiment. These are as expected due to literature examining the Democrats' and Republicans' stances on BLM (Tesler, 2016, Drakulich et al., 2020, Updegrove et al., 2020 and Reny and Newman, 2021). This facet of vote maximizing behavior has been studied extensively in various contexts (e.g. Bartels, 1998, Huddy et al., 2015 and Caughey et al., 2017). While this facet only focuses on preferences on certain issues, the analyses on strategic information transmission and salience both offer insights on so far uncovered facets in experiments. Hereby, the experiment shifts over aspects apart from ideology into focus. Strategic information transmission builds not only on the legislator's stance on BLM, but also on the local statistic on police violence victims. Thus, a legislator may have an incentive to maximize votes based first on the issue of the inquiry and second on the characteristics of the voting district. Furthermore, the salience of the issue police violence and BLM depends on neither voters' nor politicians' ideological preferences, but is a characteristic of the electorate in the respective district. Consequently, the experiment suggests that vote maximization is not only a matter of minimizing the distance between the voters' and the candidates' ideological stance as standard theoretical work on electoral competition may suggest, also for simplicity. Theory from information economics can make substantial contributions to examine the communication between political elites and voters on specific information, such as the statistic on police violence in the experiment, more closely. The salience of issues is increasingly important in theoretical work in political economy (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). In addition, empirical studies may also examine whether election campaigns depict the salience of specific issues as precisely as the response behavior in our study does.

The experiment prior to the German national election in 2021 provides mixed evidence of a racial bias and thus of taste-based discrimination in this context. The hypothesis on differences in the average length of replies depending on whether the inquirer and the candidate agree on the underlying issue hints at another facet of vote maximizing behavior. This analysis

does not focus on whether a candidate answers a request or not, but how the candidate answers to requests. Contrary to the third paper, we did not include an analysis of partisanship effects due to a different focus. We did not check for the response rates depending on whether the inquirer agrees with the stance of the candidate's party in the article.[7] The results imply that candidates also adopt the way they communicate depending on their own and the voter's stance to maximize votes. Consequently, vote maximization is not only a question of what to do, but also how to do it. Given this evidence, the experiment reinforces both experiments considering the quality of answers (e.g. Grohs et al., 2015 and Adman and Jansson, 2017) and literature exploring politicians' communication towards voters. Similar to partisanship effects, the hypothesis on differences in the average length of replies is based on both the voter's and the candidate's stance on the underlying issue. Yet, there is a key difference: Partisanship effects suggest that aligned voters receive more replies, whereas aligned voters receive on average less words. Thus, aligned voters might be served better by political elites by getting a response with a higher probability. Yet, they are served worse than unaligned voters because the responses they receive are shorter.

Finally, the fifth paper of the dissertation provides evidence in support of the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) and the issue entrepreneurship theory (e.g. Hobolt and de Vries, 2015 and Buisseret and van Weelden, 2020). AfD legislators attempt to politicize immigration in parliamentary sessions to both polarize the electorate in a new dimension and to establish the issue in the political agenda. Both theories supported by the study imply vote maximizing behavior. As this evidence comes from parliamentary sessions which were not during campaigning phases, the article suggests that vote maximization is not only met prior to elections.

1.4.4 The context is defining

The results of all papers included in the dissertation as well as the first two major take-aways and also partially the third major take-away all suggest another important insight of the dissertation: The context should never be disregarded researching political behavior under polarization. Thus, the dis-

[7] An analysis of partisanship effects would be possible in the field experiment within the German national elections only for the campaign covering dual citizenship. Only in this case, some parties feature polarized stances on the issue. While the Left Party, the Greens and the Social Democrats support dual citizenship, the AfD opposes it. There is no evidence of partisanship effects for candidates of the Left Party (Response rates are 74,04 % for supporters of dual citizenship and 77,24 % for opponents, respectively). Yet, there is evidence of partisanship effects for Green candidates (83,33 % and 62,81 %), Social Democrats (78,79 % and 61,48 %) and for AfD candidates (41,67 % and 61,32 %). These three effects are each significant at the 99 percent level.

sertation advocates contextual approaches to study phenomena in political economy in general (see, e.g., Goldschmidt et al., 2016).

The first two papers examine under which circumstances polarization is in expectation profitable for different blocs of parties. The analysis shows that polarization can be beneficial for the government if a sufficiently high number of voters is polarized in favor of it to outweigh the effect of the negativity bias. While polarization is often considered a phenomenon emerging with or due to the rise of non-government populists (see, e.g., Guriev and Papaioannou, 2022), the theoretical models on retrospective voting under polarization show that governments may also have an incentive to increase polarization. The prevalence of this incentive depends on the context as outlined above. A recent example of polarization that benefited the government is the beginning of the COVID-19 pandemic. Several government parties, e.g. the Christian Democrats in Germany, gained a lot of support, although the electorate was polarized during this period.

The first two studies also show the importance of the negativity bias for election results on a theoretical basis. This bias increases the chances of being dissatisfied with government due to polarization, and therefore affects voter shifts. Furthermore, it determines whether polarization is advantageous for an arbitrary bloc of parties. Although there is empirical evidence demonstrating the importance of the negativity bias for voting behavior (e.g. Burden and Wichowsky, 2014 and Hansen et al., 2015), theoretical literature on elections rarely covers it. The first two papers yet show that this feature should not be neglected examining voting behavior and elections. Additionally, the negativity bias differs across countries and thus leads to different effects of polarization. Without the negativity bias, a key part of the context to analyze the effects of polarization across countries might be missed. In addition to that, as stated above, the negativity bias is a psychological phenomenon and not related to preferences on policies or issues. In this sense, voting behavior is not only determined by rational utility maximization but also by psychological phenomena which also vary across countries. The studies therefore both hint at empirical investigations on how the negativity bias influences election results and implies that other aspects from, e.g., bounded rationality can affect voting behavior.

The field experiments on politicians' response behavior towards polarized voters featured in the third and fourth paper provide another example of the importance of the context in which research is conducted. As outlined above, both the majority of field experiments in the US (e.g. Butler and Broockman, 2011 and Butler et al., 2012) and a meta study summarizing these field experiments by Costa (2017) find that political elites in the US have a racial bias against Blacks. Our experiment ahead of the US 2020 elections does

not yield evidence of a racial bias against inquirers of any race.[8] Thus, even though there is substantial evidence of a racial bias against Blacks in the US (see Costa, 2017), the bias cannot be detected at least in some contexts. One explanation why we do not find a racial bias in our experiment is that it deals with an issue mostly related to African Americans (Haney-López, 2014 and Stephens-Dougan, 2020). This may incentivize legislators to treat inquirers of different races equally. Even if this explanation is not correct, there are two results from this observation. First, general claims such as that political elites in the US have a racial bias against Blacks should always be taken with a grain of salt and considered carefully depending on the context. Second, contextual factors, such as the issue of the inquiry in the experiment and geographical or cultural aspects should be considered carefully designing experiments and elaborating on the generality of findings.

The importance of the second insight is demonstrated by the findings on racial discrimination against minority voters by AfD candidates in the fourth paper. In this study, the bias against minority voters is only prevalent if the inquiry deals with an issue related to immigration. In the second campaign featuring an issue without connection to immigration, the analysis does not yield a racial bias against minority voters. Instead, the AfD candidates' response rate for voters with migration background is slightly higher compared to voters without migration background. This finding is evidence against the explanation that issues related to people with migration background in inquiries diminish a racial bias. In fact, the results from this article suggest the opposite. There are various differences from the contexts in which the two experiments were conducted, though. These may be the reasons why the abovementioned explanation is valid for the US experiment but not for the German experiment. First, the experiments have been conducted in different countries and partially with different political actors. In the German experiment, all politicians were candidates, which does not apply to the US experiment. Second, the experiments deal with different minorities. The US experiment deals with Blacks, whereas the German experiment covers voters of Turkish descent. Third, the experiments feature both issues related to migration, but the salience of these issues differs to some extent. Police violence and BLM was a highly charged issue ahead of the US 2020 elections. The salience of dual citizenship was comparatively low prior to the German national elections in 2021. All these aspects may cause the discrepancy in the prevalence of racial discrimination depending on an issue related to migration. In addition, they suggest, as outlined above, that the context has to be taken into account when evaluating the generality of results.

[8] Some studies, such as Einstein and Glick (2017) find that Blacks receive a significantly higher response rate than Whites, suggesting a bias in favor of Blacks.

Both experiments show that vote maximizing behavior is highly relevant. Yet, the prevalence of this behavior is not equal across different groups in the analyses. In the experiment prior to the US 2020 elections, we find a significant partisanship effect only for Democrats. For Republicans the effect is existent, but not significant. In the experiment ahead of the German national elections in 2021, the average length of a reply to a voter with a different stance on the given issue is only significantly longer if the candidate favors the popular opinion on the issue. As stated above, popularity is measured by the share of candidates in support of a given opinion here. In case the candidate does not support the more popular one, the average length to an inquirer the candidate disagrees with is longer, but not significantly longer, compared to an inquirer the candidate agrees with. This is evidence that the prevalence of vote maximizing behavior is, at least partially, limited to specific situations in the field experiments. Finally, the experiment ahead of the US 2020 elections finds that salience is another aspect of the context that affects the legislators' responsiveness significantly. Contrary to numerous other aspects, salience is already an increasingly important research subject. The findings from the third paper support these strands of literature.

The fifth paper on the politicization of immigration in German state parliaments reveals another result that underscores the essential role of the context. As outlined above, a large body of literature focuses on quantitative criteria to examine the politicization of immigration (e.g. Hutter and Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022). If the analysis of the study in this dissertation also built on a quantitative criterion to measure salience, the result would be that Green and AfD legislators politicized immigration equally within the scope of the study. This result would be against the strand of literature showing that right-wing parties politicize immigration (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022). The application of the newly introduced qualitative criterion for salience yields that AfD legislators attempted to increase the salience of immigration more intensively than their Green counterparts instead. Again, this result may be attributed to different contexts between the article in the dissertation and related work. Most studies on politicization of immigration do not only employ quantitative measures, but also utilize manifestos, social media data or press releases (e.g. Hutter and Grande, 2014, Meyer and Rosenberger, 2015, Grande et al., 2019, Mendelsohn et al., 2021 and Gessler and Hunger, 2022). The data source in the study in the dissertation, speeches in state legislative sessions, is different. Consequently, this analysis implies that the use of the same method across different data types might lead to different results. Thus, it is crucial to carefully consider the choice of methods and data.

1.4.5 The advantages of using different methods

The articles constituting this dissertation use different methods. As discussed in the respective subsection, the methods are chosen based on their suitability to address the different research questions examined in the papers. Without this encompassing approach, it would not have been feasible to establish new theoretical hypotheses on election results under polarization, to test the prevalence of biases and new hypotheses on politicians' response behavior to polarized voters and to employ qualitative criteria to measure politicization of immigration. As specific the research questions in each paper are, as specific are the methods. Yet, all results from the paper help to understand different facets of political behavior under polarization better and thus make valuable contributions to this research area. Consequently, the sum of the contributions each individual paper makes would be much lower if, e.g., only formal theory or quantitative methods were employed. Thus, the dissertation demonstrates that using different methods can deliver richer sets of results than a focus on a single method.

Even more importantly, the overarching take-aways so far elaborated on stem from at least two clusters of papers from the dissertation. Consequently, the different methods address not only specific research questions in the respective papers, but also yield different results that account for major findings. The way the different papers contribute to these findings varies. The first two papers provide theoretical hypotheses on, e.g., why voters with different characteristics induce different expected election results under polarization. These hypotheses have to be tested and substantiated in order to evaluate their merit for both the specific research questions in the papers, but also for the overarching take-aways. The two experiments presented in the third and fourth papers provide results from the campaigning phases of two elections. These results are empirical evidence that contribute to the major take-aways. Despite the importance of the results, there is the caveat that the results do not apply in general and are only valid in the specific contexts. The previous subsection demonstrates many cases in which the context limits the generality of results. Finally, the fifth paper contributes to the major findings with empirical evidence. It confirms many insights from related studies employing quantitative methods and thus backs up these with another method.

Finally, this dissertation shows that employing different methods also opens up a richer set of fields for subsequent research. The articles building on behavioral public choice theory offer an extensive array of results that can be the basis of empirical tests with so far scarcely considered parameters. Moreover, they emphasize the role of behavioral economics in voting behavior and thus suggest that other aspects, such as bounded rationality,

should be included more frequently. The field experiments show that the prevalence of racial biases on the side of political elites has to be put under closer scrutiny. Especially its interaction with both prevalence of polarization within the electorate and vote maximizing behavior by incumbents has to be examined more elaborately and in different contexts. The theoretical analysis on the effects if both the electorate and candidates are polarized is another avenue for research, especially implied by the experiment ahead of the US 2020 elections. Finally, the introduction of qualitative criteria to measure the politicization of immigration featured in the fifth paper shows that NLP is a valuable method to address research questions related to politicians' communication and placing specific issues. Examining the effects of specific events on each of the two prementioned issues is just one of many aspects NLP can be applied to.

To sum up, this dissertation does not only yield numerous insights on political behavior under polarization, but also shows that many methods can be employed effectively to address this field - as long as one accounts for the context carefully and knows the limits of both the approaches and the results.

2 Where have all my voters gone? When polarization meets retrospective voting

Abstract

This paper develops a behavioral public choice model with three blocs of parties and two periods. It provides a theoretical explanation on how polarizing events affect voting behavior and electoral results, e.g. in Europe during the last decade. Several well-established assumptions, such as retrospective voting, are modified in line with recent empirical literature. Retrospective voters receive payoffs by both the government and the parliamentary opposition and are subject to the negativity bias. An exogenous polarizing event affects the government's chance to satisfy voters. Satisficing is extended to a decision rule comprising two payoffs. Most results are robust to the introduction of non-voting. The government only profits from polarization if sufficient voters are polarized in favor of the government. A higher negativity bias harms the government and favors the remaining parties. The parliamentary opposition's chance to satisfy voters determines the magnitudes of voter shifts. A strong parliamentary opposition protects the government from larger losses, diminishes the gains of the extra-parliamentary opposition and lowers decreases in voter turnout.

JEL: C65, D72, D83, D91

Keywords: Voting behavior, elections, polarization, retrospective voting, negativity bias, decision-making

2.1 Introduction

During the last decade, many elections in European countries brought results entailing significant losses for the incumbents. On the one hand, in Southern Europe, the Euro Crisis and the political responses to it started to polarize the population and led to significant changes in electoral outcomes (Bosco and Verney, 2016, Orriols and Cordero, 2016, Tsatsanis and Teperoglou, 2016, Tsirbas, 2016). The previously single ruling party of Spain, the PP, lost almost 16 % of voter shares in 2015.[1] In Greece, a left-right coalition constituted by SYRIZA and ANEL replaced the prior government formed by the conservative party ND, the social democrat party PASOK and the leftoriented party DIMAR in the same year.[2] On the other hand, migration and related policies by the government led to polarization in Western European countries. This caused losses for the incumbents and the rise of right-populist parties (Akkerman, 2018, de Vries, 2018, Halikiopoulou, 2018, Jesse, 2018, Niedermayer, 2018). In the Dutch federal elections in 2017, the coalition between the VVD and PvdA achieved in total 24.4 % of voter shares less than in 2012. The results were a loss of majority and an incumbent coalition consisting of four parties.[3] In Germany, the governmental parties CDU, CSU and SPD suffered a loss of in total 13.7 % in voter shares, accounting for the largest decrease of incumbent parties in the history of the German Bundestag.[4] Even though the settings of the elections in Southern Europe differ from those in Western Europe, the patterns of changes are strikingly similar. Major societal and economic developments led to polarization and increasing dissatisfaction within the electorate. Thus, many voters opted for other parties.

This paper provides an theoretical explanation on how polarizing events affect voting behavior and electoral results. At this, I build on and extend well-established assumptions from behavioral public choice theory, such as retrospective voting. The modifications are in line with recent empirical literature on voting behavior and electoral results (e. g. de Vries and Giger, 2014, Plescia and Kritzinger, 2017, Plescia, 2017, Stiers, 2018, Stiers and Dassonneville, 2020). I introduce a parliamentary opposition that is, like the government, able to satisfy voters. A polarizing event, acting as a shock, changes the chances of the government to satisfy voters exogenously. Voters are subject to the negativity bias, so that negative changes in the chance to be satisfied by the government are strengthened. I extend satisficing to

[1] PP: "Partido Popular"

[2] ND: "Nea Dimokratia", PASOK: "Panellinio Sosialistiko Kinima", DIMAR: "Dimokratiki Aristera", SYRIZA: "Synaspismos Rizospastikis Aristeras", ANEL: "Anexartiti Ellines"

[3] VVD: "Volkspartij voor Vrijheid en Democratie", PvdA: "Partij van de Arbeid"

[4] CDU: "Christlich Demokratische Union Deutschlands", CSU: "Christlich Soziale Union Deutschlands", SPD: Sozialdemokratische Partei Deutschlands"

a decision rule capable to contain two payoffs. Analyzing this framework, I derive conditions under which specific parties profit from polarization. The numbers of voters polarized in favor or against the government as well as the negativity bias determine what parties gain and lose retrospective voters' support under polarization. The results also suggest that the strength of the parliamentary opposition is key to explain voter shifts. Thus, the model delivers testable hypotheses to explain the prementioned voter shifts in Europe and a modified model of retrospective voting behavior. In the following, I elaborate on the modifications required to make retrospective voting capable of covering the effects of polarizing events as outlined above.

Under the basic idea of retrospective voting by Key (1966), Kramer (1971) and Nordhaus (1975), voters compare the economic performance of the government to a subjective standard of performance. If and only if the government meets an arbitrary voter's standard, the latter votes for the government. This theory is supported by empirical literature on American (e.g. Lewis-Beck and Stegmaier, 2000, Nadeau and Lewis-Beck, 2001, Duch and Stevenson, 2008, Campbell et al., 2010), European (e.g. Debus et al., 2014, Plescia and Kritzinger, 2017, Plescia, 2017) and Asian elections (e.g. Shin, 2018). There are two issues applying it to the prementioned patterns in recent European elections, though. First, the performance measure is solely based on the economic performance. This fits the findings for Southern Europe to some extent, yet the discontent within electorates in Western Europe stems to large extent from the refugee crisis (e.g. Akkerman, 2018, de Vries, 2018, Jesse, 2018, Niedermayer, 2018). Thus, rethinking the nature of performance measures is necessary. Second, polarization played a strong role in the aforementioned elections. As outlined above, the refugee crisis led to significant changes in voters' satisfaction across different groups of voters in Western Europe. The same pattern applies to the Euro Crisis in Southern Europe. Such polarizing events are excluded by the theory of Nordhaus and Kramer.

Some more recent literature about retrospective voting, such as Achen and Bartels (2004), shows that even events and developments beyond the control of the government can act as performance measures. This definition encompasses both the Euro Crisis and the refugee crisis which are at least partially in the control of the respective incumbents. Their insight also influences the way payoffs, that can embody satisfaction, are modeled in theoretical work on retrospective voting. Bendor et al. (2010) specify payoffs voters receive by the government as a mix of policies and events, including those that are out of the control of the government. Other literature focusses on payoffs resulting from policies (e.g. Malhotra and Margalit, 2014, Ashworth and De Mesquita, 2014, Esponda and Pouzo, 2017, Esponda and Pouzo, 2019). The second point, polarization, is regarded less frequently. Esponda and

Pouzo (2019) show how policies can lead to a polarized electorate. In the patterns mentioned above, a certain crisis and the reaction by the government to it rather polarized voters than the entire policy-mix. The model by Bendor et al. (2011) allows for shocks in voting behavior in a sense that the probability to obtain a high payoff by the government is variable over time. While they do not focus on period-specific shocks, their framework can serve as a starting point for an explanation of the aforementioned observations.

Accounting for the required modifications on modeling retrospective voting, I establish a model that comprises polarizing events as a shock on voting behavior. This framework does not only yield testable approaches to explain how the governmental losses of voter shares within the elections from above evolved, but also provides a more precise picture of voting behavior and voter shifts under polarization in general. The rest of this paper is organized as follows: In Section 2, I set up the model and its underlying assumptions. Section 3 comprises the results of the analysis of the model. Section 4 contains the introduction of the opportunity to abstain from voting and non-voters and an analysis of this extended model. In section 5, I discuss the results from sections 3 and 4. Moreover, I outline further approaches of research subsequent to this work. Proofs may be found in the appendix.

2.2 The model

In the following, I outline the basic two-period and three-party-bloc model with retrospective voters. Moreover, I define key terms and discuss the underlying assumptions.

Assumption 1 (Parties) *There are two blocs of parties $B \in \{G, O, E\}$, with G being the government, O the parliamentary opposition and E the extra-parliamentary opposition.*

Assumption 2 (Voter types) *Voter types $T^i, i \in \{G, O, E\}$ are assigned according to the choice in the first period. Voters of the government are denoted by T^G, voters of the parliamentary opposition by T^O and voters of the extra-parliamentary opposition by T^E. The respective shares are denoted by φ^G, φ^O and φ^E. Moreover $\varphi^G + \varphi^O + \varphi^E = 1$, $\frac{1}{2}(1-\varphi^E) < \varphi^G < (1-\varphi^E)$ and $0 < \varphi^O < \frac{1}{2}(1-\varphi^E)$.*

Assumption 3 (Polarizing event) *Between period 1 and period 2, a polarizing event occurs. Voters of each type T^i may be positively, negatively or not polarized by the event. Within an arbitrary voter type T^i, voters may be polarized in different directions. The shares of non-polarized voters, voters polarized in favor of the government (henceforth "positively polarized") and voters polarized against the government (henceforth "negatively polarized")*

are denoted by φ_N^i, φ_+^i and, φ_-^i, respectively. $\theta_{\varphi^i} = \frac{\varphi_+^i}{\varphi_-^i}$ is the ratio of positively and negatively polarized voters of an arbitrary voter type T^i. The shares of polarized voters are exogenous.

Assumption 4 (Payoffs) *All voters receive a payoff $R \in \{L, H\}$ with $L < 0$ and $H > 0$ by blocs G and O, but not by E, before the election in period 2. Voters within an arbitrary voter type may receive different payoffs.*

Assumption 5 (Probabilities for payoffs) *Regardless of the direction of polarization, the probability to obtain a high payoff by the opposition is $0 \leq h_O^i \leq 1$. The probability to receive a high payoff by the government is $h_G^i + \Delta h$ for positively polarized voters, h_G^i for non-polarized voters and $h_G^i - \lambda\Delta h$ for negatively polarized voters, with $\lambda > 1$. Parameters h_G^i, Δh and λ are such that $h_G^i - \lambda\Delta h \geq 0$ and $h_G^i + \Delta h \leq 1$. Each probability to receive a low payoff is the complementary probability to the respective probability to gain a high payoff. All prementioned parameters are exogenous.*

Assumption 6 (Decision rule) *In period 2, voters employ satisficing with two payoffs to decide what party to vote for. This is defined as follows:*
Criterion 1: An arbitrary voter reelects the party bloc the voter has chosen in period 1 if and only if the voter receives a high payoff by this bloc. Obtaining a low payoff the voter shifts to another bloc with the following order:
Criterion 2: The voter shifts to a bloc yielding a high payoff. If there are two blocs fulfilling this criterion, there are equal probabilities to choose each bloc.
Criterion 3: If no bloc meets criterion 2, the voter votes for the extra-parliamentary, which does not generate a payoff.

Definition 1 (Core voters and swing voters) *An arbitrary voter is called a core voter if the voter votes for the same party bloc in period 2 as the voter did in period 1. If the voter votes for a different bloc in period 2, the voter is called a swing voter.*

Definition 2 (Expected voter shares) *The expected voter share under polarization in period 2 is denoted by P_B^P for an arbitrary bloc B, the expected voter share without polarization by P_B^{WOP}.*

Definition 3 (Order of steps) *The order of steps is as follows:*

1. *Voters are assigned to the voter types after the election in period 1 as described in Assumption 2.*

2. *As stated in Assumption 3, a polarizing event occurs between period 1 and period 2.*

3. *Payoffs of both blocs realize just before election in period* 2 *with probabilities as in Assumption* 5.

4. *In period* 2*, the next election takes place and voters elect following Assumption* 6.

Assumption 1 defines the political landscape of the basic model, featuring three party blocs. Several studies have shown that the rise of extra-parliamentary parties can be a result of dissatisfaction with the government (Best, 2013, Bailey, 2014, Franzmann, 2019). In order to examine the effect of polarization on the shares of the extra-parliamentary parties, these are added as an additional bloc in the model.

The condition $\varphi^G + \varphi^O + \varphi^E = 1$ from Assumption 2 implies that all voters have participated in the election in period 1. Consequently, there are two ways of interpretation. Firstly, the voter turnout in period 1 was in fact 100 %, so the share of non-voters is 0 %. Secondly, the neglection of non-voters allows to focus on voting decisions between different parties or blocs and on both the shares and behavior of swing voters. While the first interpretation is unrealistic, the second interpretation coincides with the motivation to explain voting behavior between parties. In fact, voter turnout is often disregarded (e.g. Malhotra and Margalit, 2014, Esponda and Pouzo, 2017, Esponda and Pouzo, 2019) or set to 100 % (e.g. Bischoff and Siemers, 2013) in theoretical work as the investigation of the voters' decision process is the key research subject. The aim of this paper is not only to describe voting behavior of single voters, but also to employ retrospective voting under polarization as an explanation for entire voter shifts. In the extensions, I allow for non-voters.

Assumption 2 indicates some homogeneity within voter types, which is established for simplicity. The realization of payoffs and the directions of polarization from Assumptions 3 and 4 allow for variety within voter types. Although the probabilities are identical within the same voter type, the final realization of the payoff can differ between arbitrary members of the same type. The same mechanism is valid for the direction of polarization. These assumptions take into account that people perceive and evaluate actions differently even though their ideological interests might be similar, which is referred to as heterogenous mental models (Johnson-Laird, 1983, Denzau and North, 1994).

Another significant new element to retrospective voting models is the polarizing event outlined in Assumption 3. Importantly, this event may be within or not within control of the government and not even related to strategic political action. Thus, not only broader topics such as migration or economic crises, but also shark attacks and droughts (see Achen and Bartels,

2004 and Achen and Bartels, 2016) as well as scandalous behavior by the incumbent are considered. This definition therefore accounts for both literature identifying that a lot of different events can affect retrospective voting behavior (e.g. Achen and Bartels, 2004 and Achen and Bartels, 2016) and the broad definition of payoffs defined in Assumption 4.

I consider the binary payoff described in Assumption 4 as the voter's subjective evaluation of the respective party's performance. Contrary to economic voting (e.g. Fiorina, 1981, Lewis-Beck, 1988, Lewis-Beck and Stegmaier, 2000, Duch and Stevenson, 2008, Dassonneville and Lewis-Beck, 2014), the factors taken into account in this evaluation are unspecified in this model. According to recent empiric studies, voters generally integrate more topics in the evaluation on the performance of parties (e.g. Fisher and Hobolt, 2010, Singer, 2011, de Vries and Giger, 2014, Plescia, 2017). Reny et al. (2019) find that attitudes towards immigration shaped voters' perceptions of the Democrats and Republicans during the US elections in 2016. Liberini et al. (2017) deliver evidence that the general well-being of individuals is a key element for retrospective voting. Thus, I interpret the term payoff in a broader sense as the general satisfaction with the respective bloc. This interpretation is similar to the definition employed by Bendor et al. (2010) and wider than definitions based on the individual monetary income (e.g. Bischoff and Siemers, 2013) or on the ideological distance of implemented policies (e.g. Esponda and Pouzo, 2019). Another difference to other theoretical work on retrospective voting is that not only the government, but also the parliamentary opposition yields a payoff. A large body of theoretical literature suggests that only the incumbent or the current government creates payoffs (e.g. Bendor et al., 2010, Bendor et al., 2011, Ashworth and De Mesquita, 2014, Esponda and Pouzo, 2017). Recent empirical studies on retrospective voting (e.g. Plescia and Kritzinger, 2017, Plescia, 2017, Stiers, 2018, Stiers and Dassonneville, 2020) imply that voters also evaluate the performance of the parliamentary opposition and that these perceptions influence their voting behavior. Importantly, this work does not provide evidence on the evaluation of the work by extra-parliamentary opposition. As such parties are not represented in the parliament, giving them few potential to satisfy voters, I assume that voters do not gain a payoff by the extra-parliamentary opposition.

The probability to obtain a high payoff by blocs G and O, outlined in Assumption 5, can be considered a measure of the alignment between the voter types' interests with the interests of each bloc (see also Bendor et al., 2010

and Bendor et al., 2011).[5] Yet, the probability does not need to depend solely on the voter's ideological preferences. This is in line with the definition of payoffs in Assumption 4. The probabilities can be considered as the chances of blocs to satisfy voters and therefore as their convincing power and competitiveness. While both blocs generate payoffs to all voters by Assumption 4, the polarizing event from Assumption 3 may only affect the chances of the government to convince voters, as stated in Assumption 5. This assumption is based on findings of existing literature, indicating that voters hold the government responsible for such events (e.g. Lewis-Beck and Stegmaier, 2000, Campbell et al., 2010, Stanig, 2013, Passarelli and Tuorto, 2014, Achen and Bartels, 2016). The term $\lambda > 1$ depicts the negativity bias and leads to a per se stronger effect of polarization for negatively polarized voters. This bias implies that individuals value negative outcomes stronger than positive outcomes of the same amount (Rozin and Royzman, 2001). Incorporating this feature is another key distinction to other theoretical work on retrospective voting. Despite the empirical evidence of its influence, the negative bias has been considered rarely in theoretical models on retrospective voting so far.[6] Employing a long-term study in the US, Burden and Wichowsky (2014) find that strong increases in the unemployment rate can be a reason to vote for a different party. Using data of the Danish national elections in 2011, Hansen et al. (2015) show that the negativity bias prevails in comparisons of international macroeconomic factors. Following Assumption 5, λ strengthens the effect of the degree of polarization Δh and consequently leads to a lower probability of being satisfied with bloc G. In line with the theory stated by Rozin and Royzman, this bias does not affect the probability for positively polarized voters.

Assumption 6 accounts for another indispensable aspect of voting models, the decision rule. The voting behavior in the model is based on satisficing. Satisficing voters, as described by Kramer (1971), Nordhaus (1975) and Fair (1978), elect the government if and only if economic measures meet their subjective aspiration levels. I modify this standard decision rule in Assumption 6 in two ways to render it compatible with Assumption 4. Firstly, a voter's decision is based on the payoff a bloc yields. This implies that not only economic factors matter because I define a payoff as the general satisfaction with the respective party bloc. Secondly, as Assumption 4 allows

[5] Importantly, as I focus on voting behavior and shocks instead of the parties' strategies, parties do not implement policy systems to achieve advantages over others (contrary to, e.g., Bendor et al., 2010 and Bendor et al., 2011).

[6] Few theoretical literature on retrospective voting considering the negativity bias and loss-aversion exists. Kappe (2013) examines how the negativity bias affects the quality and reelection chances of the government. In addition, Lockwood and Rockey (2020) provide evidence on how loss-aversion influences electoral competition and especially on the behavior of parties.

for payoffs generated by two blocs, the rule has to be extended so that more than one payoff can be taken into account. Furthermore, letting high payoffs satisfy and low payoffs dissatisfy is a simpler modification of the approach employed by Bendor et al. (2011).[7]

The assumptions on payoffs and satisficing with two payoffs yield an efficient framework to assess the effect of polarizing events on voting behavior and voter shifts in a three-bloc setting, also accounting for findings in recent empirical literature on retrospective voting. The following insights follow directly from Assumption 6:

Corollary 1 *Neither the government nor the parliamentary opposition can entice voters from each other away if the prior choice yields a high payoff for these voters.*

Corollary 2 *The extra-parliamentary opposition can only gain shares from voters that are disappointed by both bloc G and O.*

With this framework, it is possible to obtain which combination of payoffs are required for each voter type to vote for each bloc. These are depicted in Table 1:

Voter type / Party bloc voted for	T^G	T^O	T^E
Government bloc G	$H, *$	H, L	H, L and $\frac{1}{2}(H, H)$
Opposition bloc O	L, H	$*, H$	L, H and $\frac{1}{2}(H, H)$
Extra-parliamentary bloc E	L, L	L, L	L, L

Table 1: Voter decision table for basic three-bloc setting

The first payoff corresponds to the payoff generated by the government and the second payoff to the opposition. Note that by Assumption 4, bloc E does not yield a payoff. A $*$ indicates that the payoff can be either low or high. The two $*$ are a direct result from Corollary 1. Corollary 2, which is the insight that bloc E only gains from voters earning a low payoff by both other blocs, is covered by the entries consisting of L's in the last line.

Table 1 enables to calculate the expected voter share for each party bloc under polarization. For the case of polarization, there are three different

[7] One might suggest that the voters' decision-making rule is more complex, e.g. considering a history of payoffs or a stochastic process (as e.g. Bendor et al., 2011 and Kappe, 2013 employ). Yet, the availability heuristic (Kahneman and Tversky, 1973) and representative heuristic (Kahneman and Tversky, 1972) imply a simpler rule based on the latest experiences. Both heuristics essentially affect voting behavior (e.g. Huber et al., 2012, Healy and Malhotra, 2013, Healy and Lenz, 2014).

probabilities for every cell in which the payoff of the government is not embodied by a $*$. This is due to Assumption 5, indicating that differently polarized voters are assigned to individual probabilities for a high payoff by the government. This causes different probabilities of the combination in the respective cell for each voter subtype. Using the linearity of probabilities, the expected voter share under polarization can be calculated adding up all probabilities the combination in each cell of the respective line yields. The expected voter share without polarization can be derived analogously. In this case, a distinction between voter subtypes is not possible. Therefore, only one instead of three values for each cell of the government line has to be considered. All expected voter shares under polarization, P_B^P, and without polarization, P_B^{WOP} are included in the appendix.

2.3 Results

In the following section, I will analyze the effects of polarization and the negativity bias on retrospective voting behavior within the case of three blocs. At this, I check for the marginal effects of the polarization parameter Δh, of the negativity bias parameter λ and for the difference between the expected shares with and without polarization for each bloc. This enables to gain insights about effects on the share of core voters and swing voters for each bloc. Consequently, the analysis draws a precise picture of voting behavior within the framework. Proofs can be found in the appendix.

I start with the examination of the marginal effect of polarization, denoted by Δh, on the expected voter share with polarization, denoted by P_B^P for an arbitrary party bloc B. This effect is equivalent to the partial derivative $\frac{\delta P_B^P}{\delta \Delta h}$ for each bloc B. The ratios of positively and negatively polarized voters of each type, which are outlined in Assumption 3, play an essential role for this analysis. The results are as follows:

Proposition 1 (Marginal effects of polarization) *For the basic case involving three blocs, the direction of the marginal effect of polarization depends on ratio θ_{φ^G} for each bloc:*

1. *There is an effect on P_G^P resulting from each voter type T^G, T^O and T^E. Each of these is positive if and only if $\theta_{\varphi^G} > \lambda$. The magnitude of the effects resulting from T^O and T^E decreases in h_O^O and h_O^E, respectively.*

2. *There is an effect from voter types T^G and T^E on P_O^P. It is positive iff $\theta_{\varphi^G} < \lambda$. The magnitude of the effect of each type T^i increases in h_O^i.*

3. *There is an effect on P_E^P resulting from all voter types. These are positive iff $\theta_{\varphi^G} < \lambda$. The magnitude of the effect from type T^i decreases in h_O^i.*

Additionally, the effects increase in λ for negatively polarized voters of T^G.

Proposition 1 shows the importance of the shares of positively and negatively polarized voters. In fact, polarization might be beneficial for the government, even though the decrease in the probability to achieve a high payoff exceeds the respective increase due to the negativity bias. Intuitively, if a polarizing event affects sufficiently more voters' opinion about the performance of the government in a positive way than vice versa, the effect of the negativity bias is outweighed. The opposite argument accounts for the sign of the effect of polarization on the expected voter share of both opposition blocs. These blocs profit from an increase in Δh in case the per se negative effect of polarization on the probability of a high payoff by the government on voter type T^G is not outweighed by a relatively high ratio θ_{φ^G}. Intuitively, if the negativity bias outweighs the ratio of positively and negatively polarized voters, bloc G binds less core voters due to deteriorated competitive power and thus leaves more potential for blocs O and E to gain swing voters from previous government supporters.

The magnitude of core and swing voter channels stemming from type T^G is independent of the general competitive power h^i_G of bloc G. This implies that the expected effect of polarization on staying and shifting prior government supporters neither diminishes nor increases with a stronger government. The opposite is true for the strength of the parliamentary opposition concerning its influence on swing voters of type T^G. Criteria 2 and 3 from Assumption 6 explain the role of bloc O's convincing power. Whenever voters receive a low payoff by their prior choice, they shift to another bloc, which matches swing voters of type T^G. Then, following Criterion 2, the parliamentary opposition gains this share yielding a high payoff. Dissatisfying these voters leads to a shift to the extra-parliamentary opposition by Criterion 3, which does not create payoffs by Assumption 4. Consequently, the more attractive bloc O is for T^G, the more it profits from the additional potential of these swing voters elicited by polarization. A weak bloc O leads to more voters of type T^G who are discontent with all parliamentary blocs and thus search for a neutral alternative, which they find in the extra-parliamentary opposition.

The essential role of the parliamentary opposition's competitiveness is underlined by its key influence on the behavior of voters of type T^E. Notably, there is no chance for bloc E to convince core voters with good work, which stresses its dependence on the other blocs. Contrary to G and O, E does not enjoy binding or convincing mechanisms as defined in Assumption 6. In that sense, core voters of type T^E rather behave like swing voters of other types, voting again for bloc E only driven by discontent with the parliamentary blocs G and O. If the negativity bias exceeds the ratio of positively and negatively polarized voters of type T^E, more of these voters are discontent with the government. Then, the same mechanism as for swing voters of type T^G kicks in. The higher O's chances to satisfy voters of type T^E, the higher

is O's share of the respective channel evoked by polarization and vice versa for bloc E. In contrast to the channel of voters T^G, the opposition's strength influences also the channel of swing voters of type T^E shifting to the government. This stems from Criterion 2 of satisficing under two payoffs. Both bloc G and O require a high payoff to attract voters of type T^E. Therefore, changes in G's competitiveness due to polarization affect G's ability to convince core voters. For the case that G is worse off due to polarization, the negative effect is mitigated by a strong O. In this case, G had fewer chances to gain swing voters from type T^E even without polarization due to high competition. Thus, a strong parliamentary opposition protects the government from even higher losses if it is likely to attract swing voters T^E. The opposite pertains if G enjoys positive effects from polarization due to a relatively high number of positively polarized voters. Then, the gain in competitiveness is to some extent offset by a strong competition which is also attractive for swing voters T^E.

The same intuition explains the finding that the swing voter channel from type T^O for the government decreases in bloc O's chances to satisfy its prior voters. A change in G's competitiveness due to polarization has a lower impact for a bloc O which yields a high payoff to its prior voters with a high probability and therefore diminishes this swing voter channel due to its own strength. Similarly, bloc E can profit less from altered competition from bloc G due to polarization if the swing voter channel from type T^O is per se low. Importantly, changes in the degree of polarization do not alter the amount of core voters the parliamentary opposition binds. This follows directly from Criterion 1 of Assumption 6, stating that a bloc yielding a payoff keeps all voters that gain a high payoff by this bloc. As O's chances to satisfy its prior voters are not affected by polarization by Assumption 3, there is no marginal effect of polarization on this channel.

Finally, all effects related to channels from prior government supporters, T^G, increase in the negativity bias. This result comes from the fact that this bias scales the negative impact of polarization for negatively polarized voters. The higher the bias, the less likely is G to bind these voters. Thus, the channel elicited by polarization increases in the negativity bias.

I now analyze the marginal effect of the negativity bias on expected voter shares. Analogously to the previous effects, I calculate $\frac{\delta P_B^P}{\delta \lambda}$ for each bloc B. This analysis yields the following:

Proposition 2 (Marginal effects of the negativity bias) *For the three-bloc setting, the marginal effect of the negativity bias is strictly negative for the government and strictly positive for both the parliamentary and extra-parliamentary opposition. The effects are each a sum of minor effects*

caused by all voter types. The magnitudes of the effects are increasing in Δh*. Decreases and increases in* h_O^i *are the same as in Proposition 1.*

The intuition behind the directions of the effects due to an increasing negativity bias becomes clear considering the influence of the bias on competitiveness. As the probability to obtain a high payoff by bloc G is subject to the negativity bias only for negatively polarized voters, there is no opportunity that a high number of positively polarized voters can turn the sign of the effect around. Therefore, the more an electorate is focused on the negative, the more voter share loses the government in expectation. Blocs O and E always gain from a decrease in this probability and thus from the negativity bias because this deteriorates G's convincing power for negatively polarized voters of all types T^i. With a higher negativity bias, G is both less likely to bind core voters T^G and a worse competitor for swing voters of types T^O and T^E. Yet, the approach blocs O and E profit from a weaker G are different. On the one hand, the parliamentary opposition gains from weaker competition by the government in a sense that there is more potential to convince itself with a high payoff. On the other hand, the extra-parliamentary opposition receives higher voter shares because there are in expectation more voters dissatisfied with both parliamentary blocs. The different interpretation of the ways O and E profit from a higher negativity bias highlight why O's strength determines how high the effects from each channel are. Similarly to the previous analysis, a stronger parliamentary opposition capitalizes more on the additional potential of voter channels evoked by a higher negativity bias. In turn, the extra-parliamentary opposition gains less due to its missing ability to yield payoffs and the direct consequence that only voters discontent with both G and O vote for it.

There is another similarity to the analysis of marginal effects of polarization regarding the role of O's competitiveness. As in Proposition 1, a convincing parliamentary opposition protects the government from higher losses due to an electorate more focused on the negative. The intuition is again that, independent of its own strength, G has worse chances to attract swing voters even without polarization and the negativity bias facing a convincing opposition. Thus, a decrease in its own competitiveness is less harmful. The assumption that the negativity bias does not alter O's chances to bind its prior supporters with a high payoff again serves as the reason why the expected amount of core voters O keeps does not change with a change in the negativity bias.

Furthermore, decreases in the probability to receive a high payoff by bloc G due to the negativity bias are always linked to the degree of polarization Δh. Therefore, a higher Δh leads to a higher magnitude of the effects. This is the counterpart for the argument that a higher λ leads to a higher

marginal effect of polarization for negatively polarized voters of type T^G from Proposition 1. Technically, the characteristic that marginal effects of λ and Δh increase in each other is the result of those two parameters being a product deducted from h_G^i. It also indicates that if $\theta_{\varphi^G} < \lambda$, the government loses more voter shares and both opposition blocs gain more voter shares in expectation if both λ and Δh increase.

Finally, I investigate how expected voter shares in period 2 differ between an election with and without polarization. Therefore, I calculate $\Delta P_B = P_B^P - P_B^{WOP}$ for each party bloc B. The results can be summarized as follows:

Proposition 3 (Differences in expected voter shares) *In the three-bloc model, the differences in expected voter shares with and without polarization depend for each bloc on θ_{φ^G}. All channels causing differences in expected voter shares with and without polarization are equal to the respective marginal effect of polarization in Proposition 1 multiplied by Δh. Channels thus increase in Δh. Additionally, the differences with respect to negatively polarized voters of type T^G increase in λ.*

The voter shifts due to polarization can be derived directly from the marginal effects of polarization. The marginal effects of polarization multiplied by Δh equal its corresponding channel of voters. There is both an intuitive and theoretical argument behind this finding. Intuitively, polarization is the only difference in the construction of expected voter shares considered, so these channels have to be relatable to respective marginal effects of polarization.[8] Formally, checking for marginal effects of polarization on the difference between expected voter shares with and without polarization, $\frac{\Delta P_B}{\delta \Delta h}$, the linearity of differentiation yields the following: $\frac{\Delta P_B}{\delta \Delta h} = \frac{\delta P_B^P - P_B^{WOP}}{\delta \Delta h} = \frac{\delta P_B^P}{\delta \Delta h} - \frac{\delta P_B^{WOP}}{\delta \Delta h} = \frac{\delta P_B^P}{\delta \Delta h} - 0 = \frac{\delta P_B^P}{\delta \Delta h}$, which is exactly the marginal effect of polarization on the expected voter share with polarization.[9] Furthermore, this relation yields, together with the insight that the expected voter shares under polarization depend linearly on Δh: $\frac{\delta P_B^P}{\delta \Delta h} * \Delta h = \Delta P_B$.

With the relation of marginal effects of polarization and voter shifts in mind, it is also possible to transfer the intuition behind each channel from Proposition 1 to the respective channel in Proposition 3. The government can only profit from polarization if and only if the number of positively polarized voters outweighs the disadvantageous effect of polarization itself, meaning

[8] The negativity bias is modeled within polarization. Thus, it can only influence findings if and only if polarization is present. This does not apply to the opposite direction. Consequently, the negativity bias itself does not result in any differences.

[9] $\frac{\delta P_B^{WOP}}{\delta \Delta h} = 0$, since P_B^{WOP} is the expected voter share of bloc B in period 2 without polarization.

that it keeps more of its core voters and attracts more swing voters. For the parliamentary opposition and extra-parliamentary opposition, the reverse argument applies. Both O and E entice more voters away from the government if there are sufficiently many negatively polarized voters of type T^G. Additionally, since a decrease in G's competitiveness and O's constant competitiveness result in more voters discontent with both G and O, bloc E also gains higher swing voters from type T^O and keeps more swing voters in expectation. As in Proposition 1 and 2, effects on O's core voter channel do not exist since the probability to achieve a high payoff by bloc O is not affected by polarization. All effects increase in Δh. Intuitively, a higher degree of polarization leads to more voters whose perceptions are affected in expectation, which results in higher effects.

The following insights can be drawn from the analyses.

Corollary 3 *In case the share of positively and negatively polarized voters of any type T^i are the same, i. e. $\theta_{\varphi^G} = 1$, the government loses voter shares facing polarization, while both the parliamentary opposition and extra-parliamentary opposition gain shares in expectation from each type.*

Corollary 4 *The competitiveness of the parliamentary opposition diminishes the effects of both polarization and the negativity bias on expected voter shares except for its own core voters.*

2.4 Extension: Non-voters

In the previous setting, I excluded non-voters and the opportunity to abstain from voting in general, meaning that voter turnout is 100 %. This frequently made assumption (e.g. Bischoff and Siemers, 2013) allows for the exact investigation of voter shifts between parties and of the decision process. However, voter turnout has been tending to decrease for decades in Western democracies (Delwit, 2013, Blais and Rubenson, 2013, Hooghe and Kern, 2017), which highlights the relevance of this topic. Moreover, the link between party polarization and voter turnout has already been addressed (e.g. Lachat, 2008, Steiner and Martin, 2012, Moral, 2017, Wilford, 2017). Investigating the effects of voter polarization on voter turnout is therefore also a worthwhile avenue for theoretical research. To account for non-voting, I now allow for a fourth voter type, which comprises all voters who did not vote in period 1 and is denoted by T^{NV}. Its respective share is φ^{NV}. Voters of this type, like all other voters, obtain a payoff by blocs G and O. Assumption 2 has to be adapted, because non-voters are per se not part of the parliament. In order to ensure the majority of the government, $\varphi^G > \frac{1}{2}(1-\varphi^{NV}-\varphi^E)$ as bloc E is also non-parliamentary. Similarly, $0 < \varphi^O < \frac{1}{2}(1-\varphi^{NV}-\varphi^E)$, respectively, to ensure that the opposition

does not have the majority. Non-voters' probability to obtain a high payoff is denoted, analogously to other voter types, by h_B^{NV}. Non-voting itself does not create a payoff, as the "non-voting bloc" is not an electable party. Satisficing under two payoffs, as defined in Assumption 6, does not indicate how voters decide between two options that do generate payoffs. At this, Criterion 3 is modified in a sense that voters vote for bloc E or abstain with equal probability for simplicity. From these assumptions on non-voting, two observations follow directly:

Corollary 5 *Voters may only abstain from voting iff the government and opposition yield low payoffs.*

Corollary 6 *Employing Assumption 6, the extra-parliamentary opposition and abstention from voting are the only options for an arbitrary voter of any type iff the voter is dissatisfied with both the government and the opposition.*

Corollary 5 is a direct result of the assumption that non-voting does not generate a payoff. It indicates that non-voting is the result of a single reason: Voters who are discontented with the parliamentary blocs opt for a neutral alternative such as non-voting. In this sense, choosing a neutral option is better than a dissatisfying option. Other channels apart from discontent for abstaining from election do not exist in the model. Although there is empirical evidence of additional causes for non-voting, such as political ignorance, indifference, selective awareness and conditional inactivity (Ragsdale and Rusk, 1993), there are two reasons why the model by its nature draws a realistic picture why voters abstain. Firstly, there is a huge body of empirical literature on non-voting and voter turnout implying that discontent with political parties accounts for a large share of non-voters (e. g. Pammett and LeDuc, 2003, Hooghe et al., 2011, Kemmers, 2017, Rich and Treece, 2018). Secondly, except for indifference, the remaining causes for non-voting are excluded by assumption.[10] Therefore, the model is neither imprecise nor specified incorrectly, but to some extent limited as not all aforementioned reasons are covered. Within scope, the model comprises the main reason for non-voting, dissatisfaction, adequately and precisely.

As voters of type T^E, non-voters cannot be incentivized to abstain from voting again by a high payoff. The relation between the voting behavior of types T^E and T^{NV} can be summarized as follows:

Corollary 7 *The voting behavior of non-voters and of voters who elected the extra-parliamentary opposition in period* 1 *is identical. Both vote for the government and the parliamentary opposition with equal probability if these*

[10] It is possible to include indifference, meaning that an arbitrary voter receives a high payoff by both G and O, assuming that the voter abstains with some probability bigger than 0 in this case.

blocs yield a high payoff. If only one of the latter generates a high payoff, these types elect the respective bloc. Being discontented with G and O due to low payoffs, these types abstain or vote for E with equal probability.

Using all assumptions and Corollaries 5 to 7, the decision table for a three-party setting and including non-voters is as follows:

Voter type / Decision for	T^G	T^O	T^E	T^{NV}
Government bloc G	$H, *$	H, L	H, L and $\frac{1}{2}(H, H)$	H, L and $\frac{1}{2}(H, H)$
Opposition bloc O	L, H	$*, H$	L, H and $\frac{1}{2}(H, H)$	L, H and $\frac{1}{2}(H, H)$
Extra-parliamentary bloc E	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$
Abstention from voting	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$	$\frac{1}{2}(L, L)$

Table 2: Voter decision table non-voters

The identical entries for blocs E and NV highlight their equal roles in the voters' decision-making process, as outlined in Corollary 6. Furthermore, this also applies to the respective entries and decision-making of voter types T^E and T^{NV} described in Corollary 7. On the basis of Table 2, it is possible to calculate the expected voter shares with and without polarization. These are included in the appendix.

As for the basic cases, I analyze marginal effects of polarization, marginal effects of the negativity bias and differences in expected voter shares with and without polarization. At this, the insights from Corollaries 5 and 7 play an important role.

Proposition 4 (Marginal effects of polarization) *The marginal effects of polarization for the government and opposition from Proposition 1 carry over to this case. There is an additional effect from T^{NV}, which is identical to the effect of voters of type T^E. The effects for the extra-parliamentary opposition and non-voters are equal, with the effects being half of the corresponding effects for bloc E from Proposition 1 and the effect from type T^{NV} being equal to the effect from type T^E.*

Proposition 4 indicates that introducing non-voting does not alter the results from the three-bloc case without non-voters much. Corollary 6 implies that the results for the blocs E and NV are the same. This also explains that these effects are exactly half of the corresponding respect from the three-bloc case. Without the opportunity to abstain from voting, the extra-parliamentary

opposition achieves all voter shares that are disappointed by both the government and opposition. Consequently, there is a positive marginal effect of polarization not only for bloc E, but also on the number of non-voters, whenever the ratio of positively and negatively polarized voters of an arbitrary type does not exceed the parameter of the negativity bias. For blocs G and O, most insights from Proposition 1 carry over to the setting featuring non-voters. The only differences are that there are additional voter channels from prior non-voters, identical to those from the extra-parliamentary opposition and that swing voter channels to bloc E are split between bloc E and non-voters here. The mechanism to bind core voters and to attract swing voters do not change introducing non-voting as an option not yielding payoffs. Thus, only the direction to which voters discontent with G and O shift differs, but not the amount of these voters. Put differently, the opportunity to abstain does not affect polarization and consequently neither the effects of polarization on the competitiveness of G and O. This aspect also provides intuition why effects neither differ for bloc E, except for those by construction due to the existence of non-voting per se. As in the basic case, bloc E requires both G and O to dissatisfy both voters to be elected by Criterion 3 from Assumption 6. Because the opportunity not to vote does not change the convincing power of both parliamentary blocs, there is no potential to gain or lose more voters in expectation due to polarization. As voting for E, abstention from voting requires negative payoffs by G and O. Thus, as expected from Corollary 6, the effects for bloc E and the number of non-voters are the same.

The effects from all voter types that abstain from voting decrease in the probability to receive a high payoff by the opposition. Consequently, marginal effects of polarization on the expected voter share of non-voters, analogous to shares for swing voter channels of bloc G and all channels for bloc E, are lower for a parliamentary opposition that likely delivers well-perceived work. Therefore, stronger polarization is also less significant for voter turnout in case of a strong opposition. This stems from Assumption 6, indicating both that bloc E and non-voting are only considered if blocs G and O discontent voters in Criterion 3 and that a high payoff always yields the opportunity to attract swing voters in Criterion 2.

As in prior the section, I now turn my focus on marginal effects of the negativity bias.

Proposition 5 (Marginal effects of the negativity bias) *For the setting with non-voters the marginal effects of the negativity bias for the government and opposition from Proposition 3 carry over to this case. There is an additional effect from T^{NV}, which is identical to the effect of voters of type T^{E}. The effects for the extra-parliamentary opposition and non-voters*

are equal, with the effects being half of the corresponding effects for bloc E from Proposition 2 and the effect from type T^{NV} being equal to the effect from type T^E.

The relation of Propositions 1 and 2 which links the analyses of marginal effects of polarization between excluding and including non-voting holds exactly for marginal effects of the negativity bias as well. This also implies that an increase in λ, hinting at an electorate that is more focused on the negative, leads to a higher share of non-voters from all voter types and thus at a decline in voter turnout. This effect is lower for a convincing parliamentary opposition. Intuitively, a strong O can, due to a high probability to satisfy voters, decrease the negative effect on voter turnout which results from lower satisfaction with the government.

Lastly, the analysis of differences in expected voter shares follows. The relation from the basic case, $\frac{\delta P_B^P}{\delta \Delta h} * \Delta h = \Delta P_B$, also applies here.

Proposition 6 (Differences in expected voter shares) *The differences in expected voter shares for the government and parliamentary opposition from Proposition 3 carry over to this case. There is an additional channel from T^{NV}, which is identical to the channel of voters of type T^E. The differences for the extra-parliamentary opposition and non-voters are equal, with both channels being half of the corresponding channels for bloc E from Proposition 3.*

The relation between marginal effects of polarization and differences in expected voter shares from the basic setting also pertains to a setting featuring non-voters. Each voter channel from Proposition 6 can be matched with a marginal effect of polarization from Proposition 4. Thus, all voter channels are larger if there is stronger polarization caused by an event, technically depicted by an increase in Δh. As a consequence, if the government gains convincing power from polarization, it is able to mobilize more prior non-voters in a more polarized setting. Contrarily, if bloc G is harmed by polarization, the share of non-voters increases in the degree of polarization. The negative dependence of the magnitude of effects for the non-voting share on the chance that the parliamentary opposition satisfies is also applicable. As a result, well-performing parliamentary opposition parties lower the decreasing effects of polarization on voter turnout, given that there are sufficiently negatively polarized voters ensuring a positive sign for the share of non-voters. Finally, both Corollaries 3 and 4 hold in this case.

2.5 Discussion

Retrospective voting matters when voters decide what party to support. While this is nothing new, this paper incorporates several new aspects, such

as an exogenous polarizing event and the negativity bias to examine the effects of polarization within election periods. Moreover, I extend satisficing to a decision rule for two payoffs. This enables both to consider two blocs that yield payoffs and to comprise the opportunity to abstain from election as a neutral option endogenously. The rule could also be extended to a rule accounting for multiple payoffs. With these features, the model also sheds light on voting behavior and shifts in general. Thus, it is a supplementary approach to theoretical models of retrospective voting focusing on party affiliation over time (e.g. Bendor et al., 2011) or policy-setting (e.g. Bischoff and Siemers, 2013, Esponda and Pouzo, 2017).

The analysis of the basic framework yields a broad set of results. These include that the government always loses expected core voter shares with an increase in the negativity bias, whereas both opposition blocs gain from an electorate more focused on the negative. The magnitude of the effect caused by the negativity bias increases in the degree of polarization. Likewise, there is also a positive effect of the negativity bias on the magnitudes of marginal effects of polarization. Whether a bloc enjoys a positive or suffers a negative effect can be elicited checking for the ratio of positively and negatively polarized of prior voters of the government. The sign-changing thresholds for marginal effects of polarization is equal to the parameter of the negativity bias. This leads to the following mechanism: The higher the negativity bias is in an electorate, the more positively polarized voters are required for the government to gain under polarization and vice versa. Or, in other words, the more a society is focused on the negative, the more likely the government suffers from a polarizing event. This also applies to differences in expected voter shares between an election without and an election with a polarizing event, because marginal effects of polarization and differences in expected voter shares are related linearly. Consequently, more polarizing effects have a higher impact on election results. These findings are particularly interesting since by definition, polarizing events may be beyond the control of the government. In fact, the negativity bias and polarization can deteriorate the chances of the government to stay in the office even though it might not be responsible for the polarizing event.

The extra-parliamentary opposition is an eligible option for voters who are disappointed by both government and parliamentary opposition. This is ensured by the definition of satisficing under two payoffs. It provides a testable hypothesis why voters shift from a parliamentary party or bloc to the extra-parliamentary opposition. Even though the ideology of a bloc might suit an arbitrary voter well, depicted by a high chance to be satisfied with, this voter will not for this bloc being discontent with the performance in the prior period. Contrarily to the extra-parliamentary opposition, the parliamentary opposition has to convince both core and swing voters with well-perceived

work. To vote for this bloc, it does not suffice to be disappointed by the government. This may be the reason why the parliamentary opposition does not gain a large share of voters disappointed with the government. The more convincing power the parliamentary opposition has, the more it can profit from dissatisfaction with the government caused by polarization. Despite their different patterns to gain voter shares, the parliamentary opposition and the extra-parliamentary feature the same condition to profit form polarization and are both unambiguously better off with a higher negativity bias. These characterizations of the two opposition blocs are important for the analysis of election results. In case both the parliamentary and the extra-parliamentary opposition gain shares, these gains are of different natures. On the one hand, the parliamentary opposition attracts more voters dissatisfied with the government with well-perceived work. On the other hand, the extra-parliamentary opposition capitalizes on the increased probability that voters are discontent with both parliamentary blocs.

Further, the strength of the parliamentary opposition determines the magnitudes of voter shares switching due to polarization between blocs. As analyzed in section 3, this result enables the parliamentary opposition to protect the government from higher losses in case it suffers from the polarizing event. Moreover, bloc O profits more from a weakened government and lowers the potential for the extra-parliamentary opposition to gain. This comes at some surprise because polarization and the negativity bias only affect the strength of the government. Intuitively, the analysis depicts that for a given effect on the competitiveness of the government, the convincing power of the parliamentary opposition implicates how much the government is affected by this effect and what opposition bloc is subject to the stronger consequences.

The role of the parliamentary opposition's competitiveness is not only interesting from a theoretical point of view but also a key takeaway to analyze election results. Results revealing, in relative terms, a strongly losing government, an extra-parliamentary opposition with large gains and only slightly increased shares for the parliamentary opposition hints at a weak parliamentary opposition and vice versa. Therefore, the model delivers evidence that considering the strength of the parliamentary opposition is vital understanding voter shifts and election results correctly. The magnitude of gross effects is yet given by the degree of polarization, the negativity bias and the ratios of polarized voters.

The mechanisms found in the three-bloc setting are robust to the introduction of non-voting. Marginal effects of polarization and of the negativity bias as well as expected voter shares are the same for the extra-parliamentary opposition and non-voters. The latter implies that a strong opposition can,

in case the ratio of positively and negatively polarized voters of each type undercuts the parameter of the negativity bias, counteract to some extent the decreasing effects of polarization on voter turnout.

As the extra-parliamentary opposition and non-voting fulfill the same role in the decision process, their voter share is equal in the analysis. Election results show that shares voting for extra-parliamentary opposition and abstaining from voting are not equal. In fact, the share of non-voters is generally by far larger. In order to align the model to this finding, the probability to abstain should be set to a fraction higher than $\frac{1}{2}$. With the insight that these blocs share the same voter channels without further competition, it is also possible to determine this fraction from election results.

The election results from Western and Southern Europe mentioned in the introduction are characterized by significant losses for the government. According to the model, these losses can be attributed to a polarizing event which caused an increase in dissatisfaction with the government. The formal condition for this direction of shifts given by the analysis is that the share of positively and negatively polarized voters is not larger than the negativity bias. This also implicates that both the parliamentary and extra-parliamentary opposition gain compared to an election without polarization. Both implications can be found in the aforementioned elections. At this, the different gains of the opposition blocs in different countries are a fruitful avenue for detailed examination. In 2017, the parliamentary opposition in Germany only gained in total 1.1 %, while the extra-parliamentary opposition gained in total 12.5 %. For the Greek elections in January 2015, the gains for the parliamentary were in total 8.9 % and 11.2 % for the extra-parliamentary opposition. Such differences across states may be explained by differences in the strength of the parliamentary opposition in each country. The prediction from the model that voter turnout decreases is not met for these elections. One possible explanation may be that satisficing with two payoffs does not contain effects which raise voter turnout, such as expressive voting. These effects can outweigh the deteriorating effect of negative polarization on voter turnout due to dissatisfaction.

To analyze or forecast election results in line with the model, it is essential to consider that the size of shifts is characterized by the degree of polarization, the negativity bias and the strength of each parliamentary bloc. In order to analyze not only the sign but also the magnitude of shifts, these parameters are vital. I outline approaches to find these parameters in the following.

For the negativity bias, it is natural to refer to the parameter of loss aversion. There is a large body of empirical literature that seeks to explore this parameter (e.g. Kahneman and Tversky, 1991, Abdellaoui et al., 2007,

Abdellaoui et al., 2008, Bacova et al., 2013, Karle et al., 2015). While the contexts of research cover a vast number of fields, including money (e.g. Kahneman and Tversky, 1991, Abdellaoui et al., 2008, Wang et al., 2017), health (Bleichrodt et al., 2001), consumer behavior (Karle et al. 2015) and renewable energy (Bartczak et al., 2017), political issues are not part of this research area. Nonetheless, this large pool of estimations most probably yields an appropriate value for the negativity bias, because the range of means of the parameter for loss aversion is, across topics, sufficiently narrow between 2.0 and 2.7. For its application, it is also crucial to mind cross-national differences in the parameter, which are highlighted by Wang et al. (2017). Moreover, the degree of polarization and the probability to receive a high payoff by each parliamentary bloc are required. While the latter can be estimated using long-term data depicting the satisfaction of voters with each party, the estimation of the first can be based on checking for positive changes in satisfaction due to the polarizing event.[11]

If the prementioned parameters are available, the model provides a wide array of results to analyze any election featuring a polarizing event, including national elections in Southern and Western Europe in 2015 to 2017 subsequent to the Euro Crisis and migration crisis. Empirical research on retrospective voting using these elections can be conducted in a new direction based on the parameters of the model. Particularly, examining state elections can be worthwhile for two reasons. Firstly, state parties held responsible for polarizing events on a countrywide level are another hint that dissatisfaction due to polarizing events can be associated with groups not in control of the event. Secondly, such findings reinforce literature showing that politics on federal level can influence election results on lower levels (e.g. Arceneaux, 2006, Völkl, 2007, Rodden and Wibbels, 2011, Rogers, 2016, Debus, 2017).

Besides its results and explanatory power, the model also has implications for electoral competition and party behavior. Importantly, this implicates that the number of polarized voters and the degree of polarization can be influenced endogenously by parties, which was not assumed to ensure a simple analysis of effects for fixed degrees of polarization and polarized voters. Depending on how many voters are polarized in what direction, political parties and blocs can abuse polarization to maximize their voter shares. If there are relatively many negatively polarized voters, the parliamentary opposition may try to increase polarization by, e.g., stressing the polarizing topic or event, especially if this bloc is per se likely to satisfy voters. Con-

[11] Focusing on negative changes in satisfaction would also incorporate the negativity bias, according to the framework. Thus, using data about positive changes is more appropriate to check for the degree of polarization. Yet, knowing this parameter, checking for negative changes can then yield information about the parameter of the negativity bias.

trarily, facing rather non-convincing parliamentary opposition, the extra-parliamentary opposition profits most from this strategy. In case the ratio of positively and negatively polarized voters exceeds the parameter of the negativity bias voters, the government takes advantage from higher polarization, in particular competing with a weak parliamentary opposition. This case might not be probable as the negativity bias is usually bigger than 1. Yet, the increase in voters' support for the government in several European countries at the beginning of the Covid-19 pandemic may serve as an adequate example for this scenario. Another strategic instrument implied by the model is influencing the number of polarized voters. Voters can be polarized by campaigns focusing on certain elements of the polarizing event which guide them in a specific direction (e.g. Iyengar et al., 2012, De Nooy and Kleinnijenhuis, 2013, Jacobson, 2016, Grover et al., 2019). The way information is presented and how voters perceive information is also essential, especially given heterogenous mental models. Thus, not only what aspects are conveyed matters, but also, and maybe even more importantly, how these aspects are conveyed. Consequently, the model highlights the role of framing in electoral competition (e.g. Porto, 2007, Slothuus and de Vreese, 2010, Hullman and Diakopoulos, 2011, Elias et al., 2015, Vliegenhart et al., 2016).

Even though polarization can be beneficial for certain parties and blocs, these advantages may also entail heavy drawbacks in a broader sense. Whenever both parliamentary and extra-parliamentary opposition profit from polarization due to sufficiently many negatively polarized voters, voter turnout decreases. While this can be considered just a sign for bad-performing parties, lower voter turnouts are generally regarded undesirable and detrimental for democracies (Franklin, 2004, Hill, 2006, Lutz and Marsh, 2007, Hansford and Gomez, 2010, Green and Gerber, 2019). Therefore, the model adds another aspect to the large body of literature stressing various undesirable effects of polarization, e.g. impaired social cohesion that hampers economic growth (e.g. Goldschmidt and Wohlgemuth, 2004, Ager and Brückner, 2013, Aisen and Veiga, 2013, Goldschmidt, 2014, Pervaiz and Chaudhary, 2015).

Although the model yields many insights on voting behavior under polarization as well as on possible consequences, there are still open questions in this concern. Analysis about elections after period 2 is not conducted. To fill this gap, additional assumptions about the polarizing event are required. More specifically, a path indicating how many polarized voters of both directions are still polarized at which election is needed. A strictly monotonically decreasing sequence is sensible to describe this path, e.g. $\varphi^i_{-_T} = \frac{\varphi^i_{-_{T-1}}}{2}, T \geq 3$. With the number of polarized voters converging to 0, expected voter shares under polarization should converge to expected voter shares without polar-

ization. As these calculations are complex, I suggest simulations rather than algebraic solutions to approach this extension. In addition, splitting blocs to party level can be an insightful extension, especially for the government. Empirical literature (e.g. Plescia and Kritzinger, 2017, Stiers, 2018) shows that retrospective voting affects the largest member of a coalition the most. This feature can be included employing a government on party level with party-specific degrees of polarization and voter types, with the first increasing in the latter. Changes in expected voter shares should then increase in the share of voter types. Again, simulations might be the best approach to address this extension. These approaches are left for future research.

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Appendix

Expected voter shares without and with polarization

In the following, the expected voter shares without and with polarization are noted. These can be calculated adding all decision paths leading to a specific bloc and employing the linearity of probabilities.

Section 2.3: Basic case with three blocs

$$P_G^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)h_G^G + (\varphi_N^O + \varphi_+^O + \varphi_-^O)(1 - h_O^O)$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)(h_G^E(1 - h_O^E) + \tfrac{1}{2}h_G^E h_O^E)$$

$$P_G^P = \varphi_N^G h_G^G + \varphi_+^G(h_G^G + \Delta h) + \varphi_-^G(h_G^G - \lambda\Delta h)$$

$$+\varphi_N^O h_G^O(1 - h_O^O) + \varphi_+^O(h_G^O + \Delta h)(1 - h_O^O) + \varphi_-^O(h_G^O - \lambda\Delta h)(1 - h_O^O)$$

$$+\varphi_N^E(h_G^E(1 - h_O^E) + \tfrac{1}{2}h_G^E h_O^E) + \varphi_+^E((h_G^E + \Delta h)(1 - h_O^E) + \tfrac{1}{2}(h_G^E + \Delta h)h_O^E)$$

$$+\varphi_-^E((h_G^E - \lambda\Delta h)(1 - h_O^E) + \tfrac{1}{2}(h_G^E - \lambda\Delta h)h_O^E)$$

$$P_O^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)(1 - h_G^G)h_O^G + (\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)((1 - h_G^E)h_O^E + \tfrac{1}{2}h_G^E h_O^E)$$

$$P_O^P = \varphi_N^G(1 - h_G^G)h_O^G + \varphi_+^G(1 - h_G^G - \Delta h)h_O^G + \varphi_-^G(1 - h_G^G + \lambda\Delta h)h_O^G$$

$$+ (\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+ \varphi_N^E((1 - h_G^E)h_O^E + \tfrac{1}{2}h_G^E h_O^E) + \varphi_+^E((1 - h_G^E - \Delta h)h_O^E + \tfrac{1}{2}(h_G^E + \Delta h)h_O^E)$$

$$+ \varphi_-^E((1 - h_G^E - \lambda\Delta h)h_O^E + \tfrac{1}{2}(h_G^E + \lambda\Delta h)h_O^E)$$

$$P_E^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)(1 - h_G^G)(1 - h_O^G) + (\varphi_N^O + \varphi_+^O + \varphi_-^O)(1 - h_G^O)(1 - h_O^O)$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)(1 - h_G^E)(1 - h_O^E)$$

$$P_E^P = \varphi_N^G(1 - h_G^G)(1 - h_O^G) + \varphi_+^G(1 - h_G^G - \Delta h)(1 - h_O^G)$$

$$+ \varphi_-^G(1 - h_G^G + \lambda\Delta h)(1 - h_O^G)$$

$$+ \varphi_N^O(1 - h_G^O)(1 - h_O^O) + \varphi_+^O(1 - h_G^O - \Delta h)(1 - h_O^O)$$

$$+ \varphi_-^O(1 - h_G^O + \lambda\Delta h)(1 - h_O^O)$$

$$+ \varphi_N^E(1-h_G^E)(1-h_O^E) + \varphi_+^E(1-h_G^E-\Delta h)(1-h_O^E)$$

$$+ \varphi_-^O(1-h_G^E+\lambda\Delta h)(1-h_O^E)$$

Section 2.4: Extension with non-voters

$$P_G^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)h_G^G + (\varphi_N^O + \varphi_+^O + \varphi_-^O)(1-h_O^O)$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)(h_G^E(1-h_O^E) + \tfrac{1}{2}h_G^E h_O^E)$$

$$+ (\varphi_N^{NV} + \varphi_+^{NV} + \varphi_-^{NV})(h_G^{NV}(1-h_O^{NV}) + \tfrac{1}{2}h_G^{NV}h_O^{NV})$$

$$P_G^P = \varphi_N^G h_G^G + \varphi_+^G(h_G^G+\Delta h) + \varphi_-^G(h_G^G-\lambda\Delta h)$$

$$+\varphi_N^O h_G^O(1-h_O^O) + \varphi_+^O(h_G^O+\Delta h)(1-h_O^O) + \varphi_-^O(h_G^O-\lambda\Delta h)(1-h_O^O)$$

$$+\varphi_N^E(h_G^E(1-h_O^E) + \tfrac{1}{2}h_G^E h_O^E) + \varphi_+^E((h_G^E+\Delta h)(1-h_O^E) + \tfrac{1}{2}(h_G^E+\Delta h)h_O^E)$$

$$+\varphi_-^E((h_G^E-\lambda\Delta h)(1-h_O^E) + \tfrac{1}{2}(h_G^E-\lambda\Delta h)h_O^E)$$

$$+\varphi_N^{NV}(h_G^{NV}(1-h_O^{NV}) + \tfrac{1}{2}h_G^{NV}h_O^{NV})$$

$$+ \varphi_+^{NV}((h_G^{NV}+\Delta h)(1-h_O^{NV}) + \tfrac{1}{2}(h_G^{NV}+\Delta h)h_O^{NV})$$

$$+\varphi_-^{NV}((h_G^{NV}-\lambda\Delta h)(1-h_O^{NV}) + \tfrac{1}{2}(h_G^{NV}-\lambda\Delta h)h_O^{NV})$$

$$P_O^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)(1-h_G^G)h_O^G + (\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)((1-h_G^E)h_O^E + \tfrac{1}{2}h_G^E h_O^E)$$

$$+ (\varphi_N^{NV} + \varphi_+^{NV} + \varphi_-^{NV})((1-h_G^{NV})h_O^{NV} + \tfrac{1}{2}h_G^{NV}h_O^{NV})$$

$$P_O^P = \varphi_N^G(1-h_G^G)h_O^G + \varphi_+^G(1-h_G^G-\Delta h)h_O^G + \varphi_-^G(1-h_G^G+\lambda\Delta h)h_O^G$$

$$+ (\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+ \varphi_N^E((1-h_G^E)h_O^E + \tfrac{1}{2}h_G^E h_O^E) + \varphi_+^E((1-h_G^E-\Delta h)h_O^E + \tfrac{1}{2}(h_G^E+\Delta h)h_O^E)$$

$$+ \varphi_-^E((1-h_G^E-\lambda\Delta h)h_O^E + \tfrac{1}{2}(h_G^E+\lambda\Delta h)h_O^E)$$

$$+ \varphi_N^{NV}((1-h_G^{NV})h_O^{NV} + \tfrac{1}{2}h_G^{NV}h_O^{NV})$$

$$+ \varphi_+^{NV}((1-h_G^{NV}-\Delta h)h_O^{NV} + \tfrac{1}{2}(h_G^{NV}+\Delta h)h_O^{NV})$$

$$+ \varphi_{-}^{NV}((1 - h_G^{NV} - \lambda\Delta h)h_O^{NV} + \tfrac{1}{2}(h_G^{NV} + \lambda\Delta h)h_O^{NV})$$

$$P_E^{WOP} = P_{NV}^{WOP} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)\tfrac{1}{2}(1 - h_G^G)(1 - h_O^G)$$

$$+ (\varphi_N^O + \varphi_+^O + \varphi_-^O)\tfrac{1}{2}(1 - h_G^O)(1 - h_O^O)$$

$$+ (\varphi_N^E + \varphi_+^E + \varphi_-^E)\tfrac{1}{2}(1 - h_G^E)(1 - h_O^E)$$

$$+ (\varphi_N^{NV} + \varphi_+^{NV} + \varphi_-^{NV})\tfrac{1}{2}(1 - h_G^{NV})(1 - h_O^{NV})$$

$$P_E^P = P_{NV}^P = \varphi_N^G \tfrac{1}{2}(1 - h_G^G)(1 - h_O^G) + \varphi_+^G \tfrac{1}{2}(1 - h_G^G - \Delta h)(1 - h_O^G)$$

$$+ \varphi_-^G \tfrac{1}{2}(1 - h_G^G + \lambda\Delta h)(1 - h_O^G)$$

$$+ \varphi_N^O \tfrac{1}{2}(1 - h_G^O)(1 - h_O^O) + \varphi_+^O \tfrac{1}{2}(1 - h_G^O - \Delta h)(1 - h_O^O)$$

$$+ \varphi_-^O \tfrac{1}{2}(1 - h_G^O + \lambda\Delta h)(1 - h_O^O)$$

$$+ \varphi_N^E \tfrac{1}{2}(1 - h_G^E)(1 - h_O^E) + \varphi_+^E \tfrac{1}{2}(1 - h_G^E - \Delta h)(1 - h_O^E)$$

$$+ \varphi_-^E \tfrac{1}{2}(1 - h_G^E + \lambda\Delta h)(1 - h_O^E)$$

$$+ \varphi_N^{NV} \tfrac{1}{2}(1 - h_G^{NV})(1 - h_O^{NV}) + \varphi_+^{NV} \tfrac{1}{2}(1 - h_G^{NV} - \Delta h)(1 - h_O^{NV})$$

$$+ \varphi_-^{NV} \tfrac{1}{2}(1 - h_G^{NV} + \lambda\Delta h)(1 - h_O^{NV})$$

Marginal effects of polarization

This subsection covers the calculation of the effects of marginal effects of polarization for the basic case and the extension featuring non-voters.

Proposition 1: Marginal effects of polarization for the basic case with three blocs

$\frac{\delta P_G^P}{\delta\Delta h} = \varphi_+^G - \lambda\varphi_-^G + (1 - h_O^O)(\varphi_+^O - \lambda\varphi_-^O) + (1 - \frac{1}{2}h_O^E)(\varphi_+^E - \lambda\varphi_-^E)$

Separating voter types leads to thresholds $\hat{\theta}_{\varphi^G}^G = \lambda$, $\hat{\theta}_{\varphi^O}^G = \lambda$ and $\hat{\theta}_{\varphi^E}^G = \lambda$.

$\frac{\delta P_O^P}{\delta\Delta h} = h_O^G(\lambda\varphi_-^G - \varphi_+^G) + \frac{1}{2}h_O^E(\lambda\varphi_-^E - \varphi_+^E)$

Separating voter types leads to thresholds $\hat{\theta}_{\varphi^G}^O = \lambda$ and $\hat{\theta}_{\varphi^E}^O = \lambda$.

$\frac{\delta P_E^P}{\delta\Delta h} = (1 - h_O^G)(\lambda\varphi_-^G - \varphi_+^G) + (1 - h_O^O)(\lambda\varphi_-^O - \varphi_+^O) + (1 - h_O^E)(\lambda\varphi_-^E - \varphi_+^E)$

Separating voter types leads to thresholds $\hat{\theta}^E_{\varphi^G} = \lambda$, $\hat{\theta}^E_{\varphi^O} = \lambda$ and $\hat{\theta}^E_{\varphi^E} = \lambda$.

Proposition 4: Marginal effects of polarization for the extension with non-voters

$\frac{\delta P^P_G}{\delta \Delta h} = \varphi^G_+ - \lambda\varphi^G_- + (1 - h^O_O)(\varphi^O_+ - \lambda\varphi^O_-)$

$+ (1 - \frac{1}{2}h^E_O)(\varphi^E_+ - \lambda\varphi^E_-) + (1 - \frac{1}{2}h^{NV}_O)(\varphi^{NV}_+ - \lambda\varphi^{NV}_-)$

Separating voter types leads to thresholds $\hat{\theta}^G_{\varphi^G} = \lambda$, $\hat{\theta}^G_{\varphi^O} = \lambda$, $\hat{\theta}^G_{\varphi^E} = \lambda$ and $\hat{\theta}^G_{\varphi^{NV}} = \lambda$.

$\hat{\theta}^G_{\varphi^G} = \lambda$, $\hat{\theta}^G_{\varphi^O} = \lambda$ and $\hat{\theta}^G_{\varphi^E} = \lambda$.

$\frac{\delta P^P_O}{\delta \Delta h} = h^G_O(\lambda\varphi^G_- - \varphi^G_+) + \frac{1}{2}h^E_O(\lambda\varphi^E_- - \varphi^E_+) + \frac{1}{2}h^{NV}_O(\lambda\varphi^{NV}_- - \varphi^{NV}_+)$

Separating voter types leads to thresholds $\hat{\theta}^O_{\varphi^G} = \lambda$, $\hat{\theta}^O_{\varphi^E} = \lambda$ and $\hat{\theta}^O_{\varphi^{NV}} = \lambda$

$\frac{\delta P^P_E}{\delta \Delta h} = \frac{\delta P^P_{NV}}{\delta \Delta h} = \frac{1}{2}((1 - h^G_O)(\lambda\varphi^G_- - \varphi^G_+) + (1 - h^O_O)(\lambda\varphi^O_- - \varphi^O_+)$

$+ (1 - h^E_O)(\lambda\varphi^E_- - \varphi^E_+) + (1 - h^{NV}_O)(\lambda\varphi^{NV}_- - \varphi^{NV}_+))$

Separating voter types leads to thresholds $\hat{\theta}^E_{\varphi^G} = \hat{\theta}^{NV}_{\varphi^G} = \lambda$, $\hat{\theta}^E_{\varphi^O} = \hat{\theta}^{NV}_{\varphi^O} = \lambda$, $\hat{\theta}^E_{\varphi^E} = \hat{\theta}^{NV}_{\varphi^E} = \lambda$ and $\hat{\theta}^E_{\varphi^{NV}} = \hat{\theta}^{NV}_{\varphi^{NV}} = \lambda$.

Marginal effects of the negativity bias

This subsection covers the calculation of the effects of marginal effects of the negativity bias for the basic case and the extension featuring non-voters.

Proposition 2: Marginal effects of the negativity bias for the basic case with three blocs

$\frac{\delta P^P_G}{\delta \lambda} = -\Delta h(\varphi^G_- + \varphi^O_-(1 - h^O_O) + \varphi^E_-(1 - \frac{1}{2}h^E_O)) < 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$\frac{\delta P^P_O}{\delta \lambda} = \Delta h(\varphi^G_- h^G_O + \varphi^E_- \frac{1}{2}h^E_O) > 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$\frac{\delta P^P_E}{\delta \lambda} = \Delta h(\varphi^G_-(1 - h^G_O) + \varphi^O_-(1 - h^O_O) + \varphi^E_-(1 - h^E_O)) > 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

Proposition 5: Marginal effects of the negativity bias for the extension with non-voters

$\frac{\delta P_G^P}{\delta \lambda} = -\Delta h(\varphi_-^G + \varphi_-^O(1-h_O^O) + \varphi_-^E(1-\frac{1}{2}h_O^E) + \varphi_-^{NV}(1-\frac{1}{2}h_O^{NV})) < 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$\frac{\delta P_O^P}{\delta \lambda} = \Delta h(\varphi_-^G h_O^G + \varphi_-^E \frac{1}{2}h_O^E) + \varphi_-^{NV}\frac{1}{2}h_O^{NV}) > 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$\frac{\delta P_E^P}{\delta \lambda} = \frac{\delta P_{NV}^P}{\delta \lambda} = \frac{1}{2}\Delta h(\varphi_-^G(1-h_O^G)+\varphi_-^O(1-h_O^O)+\varphi_-^E(1-h_O^E)+\varphi_-^{NV}(1-h_O^{NV})) > 0$, as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

Differences in expected voter shares

This subsection covers the calculation of the differences in expected voter shares between an election with polarization and an election without polarization for the basic case and the extension featuring non-voters.

Proposition 3: Differences in expected voter shares for the basic case with three blocs

$\Delta P_G = P_G^P - P_G^{WOP}$

$= \Delta h(\varphi_+^G - \lambda\varphi_-^G + (1-h_O^O)(\varphi_+^O - \lambda\varphi_-^O) + (1-\frac{1}{2}h_O^E)(\varphi_+^E - \lambda\varphi_-^E))$

Separating voter types leads to thresholds $\hat{\theta}_{\varphi^G}^G = \lambda$, $\hat{\theta}_{\varphi^O}^G = \lambda$ and $\hat{\theta}_{\varphi^E}^G = \lambda$.

$\Delta P_O = P_O^P - P_O^{WOP} = \Delta h(h_O^G(\lambda\varphi_-^G - \varphi_+^G) + \frac{1}{2}h_O^E(\lambda\varphi_-^E - \varphi_+^E))$

Separating voter types leads to thresholds $\hat{\theta}_{\varphi^G}^O = \lambda$ and $\hat{\theta}_{\varphi^E}^O = \lambda$.

$\Delta P_E = P_E^P - P_E^{WOP}$

$= \Delta h((1-h_O^G)(\lambda\varphi_-^G - \varphi_+^G) + (1-h_O^O)(\lambda\varphi_-^O - \varphi_+^O) + (1-h_O^E)(\lambda\varphi_-^E - \varphi_+^E))$

Separating voter types leads to thresholds $\hat{\theta}_{\varphi^G}^E = \lambda$, $\hat{\theta}_{\varphi^O}^E = \lambda$ and $\hat{\theta}_{\varphi^E}^E = \lambda$.

Proposition 6: Differences in expected voter shares for the extension with non-voters

$\Delta P_G = P_G^P - P_G^{WOP}$

$= \Delta h(\varphi_+^G - \lambda\varphi_-^G + (1-h_O^O)(\varphi_+^O - \lambda\varphi_-^O)$

$+ (1 - \frac{1}{2}h_O^E)(\varphi_+^E - \lambda\varphi_-^E) + (1 - \frac{1}{2}h_O^{NV})(\varphi_+^{NV} - \lambda\varphi_-^{NV}))$

Separating voter types leads to thresholds $\hat{\theta}^G_{\varphi^G} = \lambda$, $\hat{\theta}^G_{\varphi^O} = \lambda$, $\hat{\theta}^G_{\varphi^E} = \lambda$ and $\hat{\theta}^G_{\varphi^{NV}} = \lambda$.

$\Delta P_O = P_O^P - P_O^{WOP}$

$= \Delta h(h_O^G(\lambda\varphi_-^G - \varphi_+^G) + \frac{1}{2}h_O^E(\lambda\varphi_-^E - \varphi_+^E) + \frac{1}{2}h_O^{NV}(\lambda\varphi_-^{NV} - \varphi_+^{NV}))$

Separating voter types leads to thresholds $\hat{\theta}^O_{\varphi^G} = \lambda$, $\hat{\theta}^O_{\varphi^E} = \lambda$ and $\hat{\theta}^O_{\varphi^{NV}} = \lambda$

$\Delta P_E = P_E^P - P_E^{WOP} = \Delta P_{NV} = P_{NV}^P - P_{NV}^{WOP}$

$= \frac{1}{2}\Delta h((1 - h_O^G)(\lambda\varphi_-^G - \varphi_+^G) + (1 - h_O^O)(\lambda\varphi_-^O - \varphi_+^O)$

$+ (1 - h_O^E)(\lambda\varphi_-^E - \varphi_+^E) + (1 - h_O^{NV})(\lambda\varphi_-^{NV} - \varphi_+^{NV}))$

Separating voter types leads to thresholds $\hat{\theta}^E_{\varphi^G} = \hat{\theta}^{NV}_{\varphi^G} = \lambda$, $\hat{\theta}^E_{\varphi^O} = \hat{\theta}^{NV}_{\varphi^O} = \lambda$, $\hat{\theta}^E_{\varphi^E} = \hat{\theta}^{NV}_{\varphi^E} = \lambda$ and $\hat{\theta}^E_{\varphi^{NV}} = \hat{\theta}^{NV}_{\varphi^{NV}} = \lambda$.

3 Electing in the dark? Voting behavior in light of polarization

Abstract

This paper develops a behavioral public choice model. It provides testable hypothesis to explain voter shifts in European national elections in the last decade. The model comprises three blocs of parties, the government, the opposition and so-called "profiteers". Retrospective voters evaluate the performance of each bloc. Furthermore, it introduces an exogenous polarizing event that can affect the government's and the profiteers' chance to satisfy voters. Moreover, voters are subject to the negativity bias, which means that negative changes in probabilities to satisfy are stronger than positive changes. This framework yields various results on voting behavior under polarization. Most are robust to the introduction of non-voting. The government only profits from polarization iff sufficiently many positively voters are polarized in their favor to outweigh both the negativity bias and the increased competitiveness by profiteers due to polarization. Profiteers, strengthened by polarization, harm the opposition and increase voter turnout. Additionally, a higher negativity bias impairs the government, decreases voter turnout and benefits the opposition and profiteers.

JEL: C65, D72, D83, D91

Keywords: Voting behavior, elections, retrospective voting, polarization, negativity bias, decision-making

3.1 Introduction

National elections in European countries in the previous decade were characterized by substantial shifts of voter shares. In many Southern and Western European countries, the government lost large numbers of voters. At the same time, certain parties, especially from the populist right-wing, such as the AfD in Germany, the FPÖ in Austria and the Lega in Italy, gained a lot of electoral support. Contrarily, various opposition parties in these countries could not profit from the losses the respective government incurred. Besides the similar patterns in the development of electoral support for specific parties, there is another characteristic which these national elections have in common. All elections took place in light of a polarizing event. Elections in Western Europe and Italy took place in course of the refugee crises, which led to major discrepancies between voters' satisfaction with the government (Akkerman, 2018, Chiaramonte et al., 2018 de Vries, 2018, Halikiopoulou, 2018, Jesse, 2018, Niedermayer, 2018, Di Mauro and Verzichelli, 2019). Further, in Spain and Greece, the Euro Crisis had a major impact on voters' perception of the performance of their government. This led to similar structures of voter shifts, yet the parties taking advantage of this development stem from various wings (Bosco and Verney, 2016, Orriols and Cordero, 2016, Tsatsanis and Teperoglou, 2016, Tsirbas, 2016).

In this paper, I develop a behavioral public choice model to account for the patterns from above. Modeling retrospective voters and polarization as an exogenous shock to the voters' perception of the governments' performance and to the one of so-called "profiteers", several insights about the effects of polarizing events on elections can be elicited. The government may only profit from a polarizing event iff there are enough voters polarized in its favor to outweigh first the more pronounced effects of polarization against the government and second the profiteers' increased chance to satisfy voters who are polarized against the government. The effect of polarization against the government on profiteers unambiguously profits them and harms all other blocs. This implies both that not all opposition parties may gain under polarization and that voter turnout may increase due to mobilization by profiteers. The less likely profiteers are to satisfy voters per se, the more likely they profit from polarization. Polarization rather benefits the opposition if profiteers are strong even without polarization. The model relies on the basic idea of retrospective voting and subsequent literature. I outline this idea and modifications made in this paper in the following.

In its most basic terms, retrospective voting describes that voters compare the economic performance of the government to a subjective standard of performance (Key, 1966, Kramer, 1971, Nordhaus, 1975). Only in case the government meets an arbitrary voter's standard, the latter votes for the gov-

ernment. This theory, later on called economic voting (e.g. Lewis-Beck and Stegmaier, 2000, Nadeau and Lewis-Beck, 2001), has been substantiated by empirical literature and is still a common tool to study voting behavior and electoral results (e.g. Duch and Stevenson, 2008, Campbell et al., 2010, Debus et al., 2014, Plescia and Kritzinger, 2017, Shin, 2018). Despite its explanatory power, economic voting lacks some characteristics to cover the prementioned patterns from Europe. Societal topics, such as migration, are excluded by this theory. Therefore, voters decide retrospectively based on several issues in this paper. This approach is supported by empirical findings (e.g. Achen and Bartels, 2004 and Achen and Bartels, 2016) and implemented by other theoretical work on retrospective voting (e.g. Bendor et al., 2010 and Bendor et al., 2011). In addition to this adapted scope of retrospective voting, two aspects of the patterns from above are addressed.

First, polarization played a key role in all aforementioned elections. More precisely and as outlined above, both the refugee and Euro Crisis led to significant changes in voters' satisfaction across different groups of voters. Polarization can be modeled as a shock on the performance evaluation. Such shocks are not included in economic voting, but can be accounted for if modeled precisely. Second, according to economic voting, voters only assess the performance of the government. This scope of evaluation does not offer an explanation for the rise of certain parties in Europe, especially from the populist right-wing. Consequently, the question why other opposition parties often did not enjoy increases in their voter shares remains open. In order to embrace these developments in a theoretical framework, voters' evaluations of multiple parties are required. Recent empirical work on retrospective voting also supports this idea. Several studies (e.g. Plescia and Kritzinger, 2017, Plescia, 2017, Stiers, 2018, Stiers and Dassonneville, 2020) suggest that voters also evaluate the performance of opposition parties.

The incorporation of polarization, accounting for the first point, is considered rarely in theoretical literature on retrospective voting. Importantly, the aforementioned patterns show that specific topics and the reactions by some parties led to shocks in voters' satisfaction with parties. Work focusing on the entire policy mix that results in payoffs and polarization as by e.g. Esponda and Pouzo (2019) is not sufficiently precise to address this aspect. The model by Bendor et al. (2011) allows for variations in the probability to obtain a high payoff by the government over time. While they do not focus on shocks within an election period, their framework may provide a suitable approach to model polarization acting as a shock to voters' perception of the work by parties. The second issue, the introduction of multiple parties and performance evaluations on party level, is covered scarcely by theoretical literature. Most work features two-party models (e.g. Bendor et al., 2010, Bischoff and Siemers, 2013, Ashworth and De Mesquita, 2014,

Esponda and Pouzo, 2019). Modeling the underlying political landscapes and discrepancy in gains between different opposition parties appropriately requires more parties or blocs. Bendor et al. (2011) feature competition of three or more parties. Yet, they neglect payoffs by non-governmental parties.

Using the existing literature on retrospective voting as a basis, I establish a three-party model with retrospective voters, allowing for polarizing events that act as a shock to voting behavior. The framework allows for the analysis of voting behavior and voter turnout for elections under polarization. For instance, it provides a testable approach to explain the voter shifts from recent European elections, consisting of a heavily losing government but only specific parties in the opposition profiting from this. The rest of this paper is organized as follows: In section 2, the model is established and discussed. Section 3 comprises the results of the analysis. Section 4 contains the introduction of non-voters and non-voting as an extension to the basic model. Additionally, it contains an analysis of this modified version of the model analogous to the approach in section 3. In section 5, I discuss the results from sections 3 and 4. Moreover, I outline ideas for subsequent research. Proofs may be found in the appendix.

3.2 The model

In the following, I outline the basic three-party-bloc and two-period model and define key terms. At first the assumptions on parties and the assignment of voters in period 1 are established. After that, I characterize the probabilities with which voters receive payoffs by parties before election in period 2. Finally, the voters' decision rule at election in period 2 is defined and the order of steps is summarized.

The political landscape contains three blocs of parties $i \in \{G, O, P\}$, with G being the government, O the parliamentary opposition and P profiteer parties. The latter may be parliamentary, but not part of G or O. Essentially, blocs may consist of more than one party, allowing for the application in different settings. In Europe, the blocs in consideration are often represented by several parties. The distinction between profiteer parties and the bloc of the parliamentary opposition is key to incorporate the effects of polarization on the chances to satisfy voters described later in this section properly. This issue is discussed later in this section. Voter types $T^j, j \in \{G, O, P\}$ are assigned according to the choice in period 1. Voters of the government are denoted by T^G, voters of the opposition by T^O and voters of profiteer parties by T^P. The respective shares are denoted by φ^G, φ^O and φ^P. Moreover, $\varphi^G + \varphi^O + \varphi^P = 1$, $\frac{1}{2} < \varphi^G < 1$, $0 < \varphi^O < \frac{1}{2}$ and $0 \leq \varphi^P < \frac{1}{2}$. Notably, the only restriction on the share of voters who vote for bloc P in period 1, φ^P, is that the share does not yield a majority. This also implies that profiteer

parties may stand for election in period 2 for the first time. The condition $\varphi^G + \varphi^O + \varphi^P = 1$ implies that non-voters are neglected. This allows to examine voting decisions only between different blocs and to examine effects on both the shares and behavior of swing voters. Therefore, a focus on voting behavior between parties is implied. Abstention is often disregarded in theoretical literature on retrospective voting (e.g. Bischoff and Siemers, 2013, Malhotra and Margalit, 2014, Esponda and Pouzo, 2017, Esponda and Pouzo, 2019). The goal of this paper is to provide an explanation for shifts of retrospective voters between different party blocs under polarization. Thus, non-voting is not introduced in the basic model, but serves as an extension. Next, the payoffs, depicting the voters' satisfaction with each blocs' work, are characterized.

All voters receive a payoff $R \in \{L, H\}$ with $L < 0$ and $H > 0$ by each bloc prior to period 2. The payoff reflects the voter's satisfaction with the respective bloc. Voters within an arbitrary voter type may receive different payoffs. The assumption that the payoff reveals each voter's general satisfaction with each bloc is wider than in most models and similar to the one considered by Bendor et al. (2010) and Bendor et al. (2011). It accounts for evidence highlighted by recent empiric studies which show that voters generally take various topics into account judging on the performance of parties (e.g. Fisher and Hobolt, 2010, Singer, 2011, de Vries and Giger, 2014, Plescia, 2017). Specifically, attitudes towards immigration (Reny et al., 2019, Dustmann et al., 2019, Dostal, 2019) and the voters' general well-being (Liberini et al., 2017) may influence the performance evaluation of retrospective voters fundamentally. Moreover, I assume that all three blocs yield payoffs. This is a key difference to theoretical literature assuming that only the current government creates payoffs (e.g. Bendor et al., 2010, Bendor et al., 2011, Ashworth and De Mesquita, 2014, Esponda and Pouzo, 2017). Recent empirical studies on retrospective voting (e.g. Plescia and Kritzinger, 2017, Plescia, 2017, Stiers, 2018, Stiers and Dassonneville, 2020) imply that voters also evaluate the performance of opposition parties and that these perceptions influence their voting behavior. Thus, to account for this result, not only government parties, but also opposition parties generate payoffs in my framework. Besides, there is no clear evidence whether extra-parliamentary parties yield payoffs. Numerous much-noticed and effective campaigns conducted by parliamentary and exter-parliamentary European populist parties (e.g. Schmuck and Matthes, 2017, Nai, 2018, Silva, 2018) and their strong presence in media (e.g. Sheets et al., 2016, Ernst et al., 2019) yet suggest that voters have sufficient information about these parties to assess their performance. As these parties can be considered profiteer parties by my definition, I assume that bloc P also generates payoffs.

Between period 1 and period 2, an exogenous polarizing event occurs. This event may be within or not within control of the government and not even related to strategic political action. Thus, not only broader topics such as migration or economic crises, but also shark attacks and droughts (see Achen and Bartels, 2004 and Achen and Bartels, 2016) as well as scandalous behavior by the incumbent are considered. This definition therefore accounts for literature identifying that a lot of different events can affect retrospective voting behavior (e.g. Achen and Bartels, 2004, de Vries and Giger, 2014, Achen and Bartels, 2016 and Liberini et al., 2017). Voters of each type T^j may be not polarized, in favor of government (henceforth "positively polarized") or against the government (henceforth "negatively polarized") by the event. Within an arbitrary voter type T^j, voters may be polarized in different directions towards the government. The shares of non-polarized voters, positively polarized voters and negatively polarized voters towards bloc G are denoted by φ_N^j, φ_+^j and, φ_-^j, respectively. $\theta_{\varphi^j} = \frac{\varphi_+^j}{\varphi_-^j}$ is the ratio of positively and negatively polarized voters of an arbitrary voter type T^j. The shares of polarized voters are exogenous.

The probabilities for each voter type T^j to receive a high payoff H by each bloc i are assumed to depend on the direction of polarization as follows:

Direction of polarization / Party bloc	No polarization: Share φ_N^j	Positive polarization: Share φ_+^j	Negative polarization: Share φ_-^j
Government bloc G	h_G^j	$h_G^j + \Delta h$	$h_G^j - \lambda\Delta h$
Opposition bloc O	h_O^j	h_O^j	h_O^j
Profiteer bloc P	h_P^j	h_P^j	$h_P^j + \Delta h$

Table 1: Probabilities to receive a high payoff by each party bloc under different directions of polarization

Parameters are exogenous and such that all probabilities are bigger than 0 and smaller than 1, with $\Delta h > 0$ and $\lambda > 1$.

$\Delta h > 0$ depicts the degree to which the polarizing event may polarize voters. Importantly, the assumption that the degree of polarization is exogenous matches the characteristic that the polarizing event acts as a shock to the convincing power of the government. The values h_i^j are considered as a measure of the alignment between the interests of the respective voter

type and the respective bloc. Interpreted differently, these probabilities can be regarded the competitive strength or convincing power of a bloc. Given that probabilities are treated as exogenous, parties cannot increase their convincing power by, e.g. setting policies.[1] There are few restrictions on probabilities. Neither restrictions hinting at party affiliation, e.g. $h_G^G > h_O^G$, nor restrictions on the blocs' combined competitive powers, e.g. $h_G^G + h_O^G + h_P^G = 1$, are made. The changes regarding the strength of bloc G stem from empirical evidence that such events are associated with the government (e.g. Lewis-Beck and Stegmaier, 2000, Campbell et al., 2010, Stanig, 2013, Passarelli and Tuorto, 2014, Achen and Bartels, 2016). Further, Table 1 depicts an increase in the competitive power of profiteer parties concerning negatively polarized voters. This may be induced by special campaigns addressing these voters. Recent studies have shown that social media is an attractive tool for populists to address voters (e.g. Tufekci, 2018 and Zhuravskaya et al., 2020) that and they utilize social media to increase their support (e.g. Allcott and Gentzkow, 2017, Guess et al., 2020 and Liberini et al., 2020). The unique characteristic of bloc P in terms of probabilities to yield a high payoff also suggests the term and the role of profiteer parties in the political landscape. This bloc contains parties that have unambiguously better chances to satisfy negatively polarized voters under polarization and is thus separated from bloc O, whose competitiveness is not affected at all by polarization. Moreover, negatively polarized voters' probability to gain a high payoff by the government features another key ingredient of the model. The decrease in the probability that the government satisfies due to negative polarization is stronger than the increase in case of positive polarization, which is denoted by $\lambda > 1$. With this specification, λ depicts the negativity bias, which generally implies that individuals value negative outcomes stronger than positive outcomes of the same amount (Rozin and Royzman, 2001). Albeit empirical studies show that this bias plays an important role within voting behavior (e.g. Burden and Wichowsky, 2014, Hansen et al., 2015), theoretical models on retrospective voting consider it rarely.[2]

The assumptions on voters hint at some homogeneity within and partially across voter types since some characteristics are equal. Yet, both the direction of polarization and the realization of the payoff may differ within voters of a specific type. This heterogeneity is implied by heterogenous mental models (Johnson-Laird, 1983, Denzau and North, 1994).

[1] The reaction on the polarizing event may result in changes in these probabilities by the degree of polarization Δh. Yet, these changes are also exogenously given.

[2] There is few theoretical literature on retrospective voting covering the negativity bias and loss-aversion. Kappe (2013) examines how the negativity bias affects the quality and reelection chances of the government. Moreover, Lockwood and Rockey (2020) provide evidence on how loss-aversion influences electoral competition and especially the behavior of parties.

Next, the decision rule voters employ is defined:

Definition 1 (Decision rule) *Voters employ satisficing under multiple payoffs to decide what party to vote for in period 2. This is based on the following criteria:*
Criterion 1: An arbitrary voter reelects the party bloc the voter has chosen in period 1 if and only if the voter receives a high payoff by this bloc. Obtaining a low payoff the voter shifts to another bloc with the following order:
Criterion 2: The voter shifts to a bloc yielding a high payoff. If two blocs fulfill this criterion, there are equal probabilities to choose each bloc.
Criterion 3: In case criterion 2 is not fulfilled by any bloc, the voter elects another bloc generating a low payoff. If two blocs meet this criterion, each of these will be chosen with equal probability.

In its basic terms, the voting behavior outlined in Definition 1 is characterized by satisficing.[3] Satisficing voters, as described by Kramer (1971), Nordhaus (1975) and Fair (1978), vote for the government only in case economic measures meet their subjective aspiration levels. I adjust this basic decision rule in two ways to render it suitable for my model. First, a voter's decision is based on the payoff a bloc generates, which is not necessarily based on economic outcomes as defined. Second, since all three considered blocs generate payoffs, the rule has to be extended so that more than one payoff can be considered. Moreover, a performance standard that serves voters as a reference to evaluate the work of parties is required. Definition 1 implicates that this standard for each party is such that a high payoff always satisfies and a low payoff dissatisfies an arbitrary voter in period 2, which is a simplification of the approach employed by Bendor et al. (2011). In Definition 1, all features are combined under the term satisficing under multiple payoffs. Notice that with this rule an arbitrary party bloc i cannot entice voters from their prior choice away if the latter yields a high payoff for these voters, even if i also generates a high payoff.

With this framework, the order of steps within the model can be summarized as follows:

Definition 2 (Order of steps) *The order of steps is as follows:*

1. Voters are assigned to the voter types after the election in period 1.

[3] One might suggest that the voters' decision-making rule is more complex, e.g. considering a history of payoffs or a stochastic process (as e.g. Bendor et al., 2011 and Kappe (2013) employ). Yet, the availability heuristic (Kahneman and Tversky, 1973) and representative heuristic (Kahneman and Tversky, 1972) imply a simpler rule based on the latest experiences. Both heuristics essentially affect voting behavior (e.g. Huber et al., 2012, Healy and Malhotra, 2013, Healy and Lenz, 2014).

2. *A polarizing event occurs between period* 1 *and period* 2*.*

3. *Payoffs of all blocs realize just before election in period* 2*.*

4. *In period* 2*, the next election takes place and voters elect using satisficing under multiple payoffs.*

From Definition 1, all combinations of payoffs inducing voter type T^j to vote for bloc i can be derived. The following table depicts those combinations.

Voter type / Party bloc voted for	T^G	T^O	T^P
Government bloc G	$H, *, *$	H, L, L $\frac{1}{2}(H, L, H)$ $\frac{1}{2}(L, L, L)$	H, L, L $\frac{1}{2}(H, H, L)$ $\frac{1}{2}(L, L, L)$
Opposition bloc O	L, H, L $\frac{1}{2}(L, H, H)$ $\frac{1}{2}(L, L, L)$	$*, H, *$	L, H, L $\frac{1}{2}(H, H, L)$ $\frac{1}{2}(L, L, L)$
Profiteer bloc P	L, L, H $\frac{1}{2}(L, H, H)$ $\frac{1}{2}(L, L, L)$	L, L, H $\frac{1}{2}(H, L, H)$ $\frac{1}{2}(L, L, L)$	$*, *, H$

Table 2: Voter decision table for basic setting

Note that each line vector in each cell denotes an individual combination of payoffs. Within each vector, the first entry is associated with the payoff generated by the government, the second entry the payoff by the opposition and the third entry a payoff by the profiteer bloc. A $*$ indicates that the payoff can be either low or high.

Using the linearity of probabilities, Table 2 enables to calculate the expected voter share for each party bloc with and without polarization. These are defined as follows:

Definition 3 (Expected voter shares) *The expected voter share under polarization in period* 2 *is denoted by* V_i^{PC} *for an arbitrary bloc* i*, the expected voter share without polarization by* V_i^{NPC}*. Moreover, the difference between shares,* $V_i^{PC} - V_i^{NPC}$*, is denoted by* ΔV_i*.*

All expected voter shares can be found in the appendix. The analysis in the next sections distinguishes between core voters and swing voters. At this, I use the following definition:

Definition 4 (Core voters and swing voters) *An arbitrary voter is called a core voter if the voter votes for the same party bloc in period* 2 *as the voter did in period* 1*. If the voter votes for a different bloc in period* 2*, the voter is called a swing voter.*

3.3 Results

In the following section, I will analyze the effects of polarization and the negativity bias on retrospective voting behavior within the basic case comprising three blocs. I will therefore study the marginal effects of the negativity bias parameter λ and the difference between the expected shares with and without polarization for each bloc. This allows to gain insights about effects on the expected shares of core voters and swing voters for each bloc and thus to obtain a deep understanding of voting behavior in the model. Deriving the marginal effects of the degree of polarization Δh can be another potential point of analysis. Despite the important role of this parameter, I focus on the aforementioned two aspects. The reason is that polarization causes all changes in probabilities to receive a high payoff and thus in expected voter shares.[4] This makes the analysis of differences in expected voter shares very similar to a study of marginal effects of polarization.[5] A sketch of the latter can yet be found in the appendix, as well as the proofs for all propositions.

I start with the analysis of the marginal effect of the negativity bias on the expected voter shares with polarization. This effect corresponds to the partial derivative $\frac{V_i^{PC}}{\Delta\lambda}$ for each bloc i. The results are as follows:

Proposition 1 (Marginal effects of the negativity bias) *In the basic setting the marginal effects of the negativity bias are as follows:*

1. *For the government, there are negative effects from all voter types.*
2. *The opposition enjoys positive effects from voter types T^G and T^P.*
3. *There are positive effects from types T^G and T^O for the profiteer bloc.*

Effects across voter types stem from negatively polarized voters and add up to 0. *The magnitude of the effects from swing voter types T^O and T^P increase in the probability to be disappointed by the prior choice.*

Proposition 1 shows that the government unambiguously suffers from an increase in the negativity bias while the opposition and profiteers unequivocally profit from it. Thus, the more the electorate is focused is on the negative, the higher are the expected losses in voter shares for the government and vice versa for the other blocs. The intuition behind these results becomes clear considering the influence of the negativity bias on probabilities to obtain a high payoff. The negativity bias only affects the probability

[4] Changes due to the negativity bias are only applicable if voters are also polarized.

[5] There are differences between the two analyses because taking differences and differentiating with respect to Δh yields different results for all terms in V_i^{PC} that feature $\lambda\Delta h$ or Δh^2. These differences are nevertheless not as significant to render an additional analysis noteworthy in this section.

to enjoy a high payoff by bloc G in a strictly negative direction. Consequently, there is no way for the government to keep more core voters nor to entice more swing voters from other blocs in expectation if the negativity bias increases. On the opposite, the probabilities to obtain a high payoff by blocs O and P are not altered by this bias for neither direction of polarization. Therefore, these blocs do not profit directly from an electorate more focused on the negative based on a higher chance to satisfy voters. The opposition and profiteers can take advantage of this effect indirectly via gaining more swing voters in expectation compared to the absence of polarization, because the government is less likely to make negatively polarized voters content. Moreover, the insignificance of the negativity bias for the general convincing power of the blocs O and P also shows why their core voter channel is not affected. Satisficing under multiple payoffs implies that voters stick to their prior choice if the performance of the respective bloc is good. Because the negativity bias does not alter the binding power of the opposition and profiteers, the core voter channels of these blocs are not changed in expectation. The mechanic to keep core voters, creating a high payoff, accounts for the finding that swing voter channels from types T^O and T^P increase in the probability that voters are discontent with their prior choice. If there are high chances that blocs O and P disappoint their prior voters, there is more potential for the remaining blocs to attract these voters. This potential is, facing a higher negativity bias, rather utilized by the opposition or the profiteers, respectively, as the convincing power of the government is hampered by a stronger focus on the negative. For swing voter channels of voter type T^G, this intuition does not apply. The number of negatively polarized voters shifting from the government to another bloc depends directly on the negativity bias since it deteriorates the binding power of the government. The magnitude of swing voter channels from this type, T^G, for the opposition and the profiteers then increases with the own convincing power and decreases with the convincing power of the competitor. This relation highlights the importance of per se high chances to deliver a good performance in order to attract swing voters.

Next, I investigate how expected voter shares in period 2 differ between an election with and without polarization. Therefore, I calculate ΔV_i for every party bloc i. The results can be summarized as follows:

Proposition 2 (Differences in expected voter shares) *For the basic setting with three blocs, there are thresholds* $\hat{\theta}^i_{\varphi^j}$ *for swing voter channels for which the difference between expected voter shares with and without polarization is* 0*. These critical values can be written as in Table 3:*

Voter type / Party bloc	T^G	T^O	T^P
Government bloc G Higher expected voter share with polarization iff θ_{φ^j} exceeds $\hat{\theta}^G_{\varphi^j}$	No swing voters	$\hat{\theta}^G_{\varphi^O}$ $= \lambda + \frac{1-h^O_G}{1-h^O_O}$ $= \lambda + 1$	$\hat{\theta}^G_{\varphi^P} = \lambda$ $+ \frac{h^P_G - \lambda\Delta h + 1 - h^P_O}{1-h^P_P}$
Opposition bloc O Higher expected voter share with polarization iff θ_{φ^j} undercuts $\hat{\theta}^O_{\varphi^j}$	$\hat{\theta}^O_{\varphi^G} = \lambda$ $- \frac{1-h^G_G+\lambda\Delta h}{1-h^G_P+h^G_O}$	No swing voters	$\hat{\theta}^O_{\varphi^P} = \lambda$ $- \frac{1-h^P_G+\lambda\Delta h+h^P_O}{1-h^P_P}$
Profiteer bloc P Higher expected voter share with polarization iff θ_{φ^j} undercuts $\hat{\theta}^P_{\varphi^j}$	$\hat{\theta}^P_{\varphi^G} = \lambda$ $+ \frac{1-h^G_G+\lambda\Delta h}{1-h^G_O+h^G_P}$	$\hat{\theta}^P_{\varphi^O}$ $= \lambda + \frac{1-h^O_O}{1-h^O_O}$ $= \lambda + 1$	No swing voters

Table 3: Voter decision table for basic setting

At this, λ expresses the ratio $\hat{\theta}^i_{\varphi^j}$ if polarization only affected the convincing power of G. The second summand is a ratio of the positive effect of polarization on the convincing power of P and the effect on the convincing power of G. The threshold for core voters of bloc G is $\hat{\theta}^G_{\varphi^G} = \lambda$. Regarding core voters of bloc O, there is no difference. Bloc P is able to bind more core voters under polarization, with the difference being $\varphi^P_- \Delta h > 0$.

Magnitudes of core voter channels and swing voter channels of voter type T^O, of type T^G for bloc P and core voter effects increase in Δh. For swing voter channels of voter types T^P and T^G only for bloc O, the marginal effect of Δh is ambiguous.

It is furthermore possible to obtain all values $\hat{\theta}^G_{\varphi^P}$, $\hat{\theta}^O_{\varphi^G}$, $\hat{\theta}^O_{\varphi^P}$ and $\hat{\theta}^P_{\varphi^G}$ can take.

Corollary 1 *The intervals for thresholds $\hat{\theta}^G_{\varphi^P}$, $\hat{\theta}^O_{\varphi^G}$, $\hat{\theta}^O_{\varphi^P}$ and $\hat{\theta}^P_{\varphi^G}$ are as follows:*

$\hat{\theta}^G_{\varphi^P} : (\lambda, \frac{2}{\Delta h} - 1)$, $\hat{\theta}^O_{\varphi^G} : (\lambda - \frac{1}{\Delta h}, \lambda(1 - \frac{\Delta h}{2}) - \frac{\Delta h}{2})$,

$\hat{\theta}^O_{\varphi^P} : (\lambda - \frac{2}{\Delta h}, \lambda(1 - \Delta h) - \Delta h)$ *and* $\hat{\theta}^P_{\varphi^G} : (\lambda(1 + \frac{\Delta h}{2-\Delta h}) + \frac{\Delta h}{2-\Delta h}, \infty)$.

Contrary to marginal effects of polarization, Proposition 2 shows that not only negatively polarized voters, but also positively polarized voters play

an important role studying differences in expected voter shares. Notably, the ratio of positively and negatively polarized voters required for each bloc to make polarization advantageous in expectation can be calculated. Intuitively, polarization only leads to more voters for the government if there are sufficiently positive polarized voters to outweigh the two negative effects of polarization. Firstly, the decrease in the own convincing power by $\lambda\Delta h$ accounts for the λ in thresholds because this decrease is λ times as high as the increase in convincing power, Δh, due to positive polarization. Secondly, negative polarization leads to a higher probability that profiteers satisfy voters which enhances their competitiveness. Facing a stronger competitor, the number of positively polarized voters the government needs to be better off with polarization is even higher. The effect of the second mechanism is depicted in the numerator of the second summands of thresholds. The denominators can be explained by the deteriorating effect on the convincing power of the government induced by negative polarization. Checking for the magnitudes of swing voter channels from marginal effects of the negativity bias, it becomes clear that they are identical to the denominators here, except for the missing positive effects of polarization on the convincing power of profiteers in denominators, denoted by Δh.

This pattern to interpret the critical thresholds $\hat{\theta}^{i}_{\varphi^j}$ can also be employed to grasp the different effects of polarization on differences in expected voter shares for the opposition. The first summand summarizes that if polarization only affected the probability to be content with the government, the opposition would profit for ratios of positively and negatively polarized voters lower than the negativity bias λ. This is the exact opposite of the direction observed for the government since the opposition can take advantage of negative polarization and is worse off with positive polarization on side of the government. The second effect, which contains the increased probability that negatively polarized voters are satisfied by profiteers, affects the opposition negatively in an indirect manner. While swing voters are not less likely to be attracted by the opposition, voters are more likely convinced by profiteers. This increase in competition deteriorates the chances for the opposition to gain from swing voter channels. Not enjoying a higher probability to satisfy negatively polarized voters, or put differently, being neutral with respect to polarization, is therefore in regard of this effect disadvantageous for the opposition when it comes to expected voter shares.

Concerning the intuition behind the swing voter thresholds for profiteers, $\hat{\theta}^{P}_{\varphi^j}$, the pattern from the analysis of the prior two blocs pertains again. Analogously to the opposition, profiteers gain from the effects from polarization on the convincing power of the government as long as there are sufficiently negatively polarized voters to keep the ratios θ_{φ^j} lower than the negativity bias λ. Contrarily to the other two blocs, profiteers enjoy direct

gains from the second effect, which is an increased chance to content negatively polarized voters. This is reflected by a positive second summand, implying that the condition to render polarization profitable for profiteers is relaxed. For instance, even if the ratio of positively and negatively polarized voters is exactly λ, implying neither gains nor losses for profiteers based on the first effect, the second effect induces expected gains in swing voter shares under polarization for profiteers. Intuitively, positive and negative polarization solely on side of the government cancel out, but the higher competitiveness of profiteers allows them to achieve more swing voter shares.

Notably, the interpretation outlined above holds for all swing voter types. There is yet a key difference between swing voter channels of types T^G and T^P on the one hand and of type T^O on the other hand. The second summand of thresholds concerning this type, $\hat{\theta}^i_{\varphi^O}$, only depends on the probability to obtain a high payoff by the prior choice and cancels out to 1. All other thresholds depend on all three probabilities. The reasons behind this finding are that polarization does not alter the convincing power of the opposition and that, following satisficing under multiple payoffs, only low payoffs let voters shift. Thus, polarization does not change the expected amount of swing voters of type T^O. This amount is $(1 - h^O_O)\varphi^O$. Polarization affects the distribution of this number of swing voters between the two remaining blocs, the government and profiteers, though. As pointed out above, polarization influences the competitiveness of these two blocs and therefore their ability to entice swing voters.

The analysis and interpretation of thresholds $\hat{\theta}^i_{\varphi^j}$ allows for the following insights:

Corollary 2 *In case all ratios of θ_{φ^j} are equal to the parameter of the negativity bias λ, the increase in the probability to enjoy a high payoff by profiteers for negatively polarized voters leads strictly to expected losses in swing voter shares for the government and opposition and to expected gains for themselves. If the effect of polarization on profiteers was absent, expected swing voter shares with and without polarization would be equal.*

Corollary 3 *If there are equally many positively and negatively polarized voters of each type, $\theta_{\varphi^j} = 1$, the government is unambiguously worse off and profiteers are unequivocally better off in expectation regarding achieved swing voter shares. For the opposition, the direction is ambiguous.*

Both Corollary 2 and 3 underline the essential role of the increased convincing power of profiteers for negatively polarized voters. Corollary 2 shows how it shapes the expected outcomes if the influence of polarization on the chance to be satisfied by the government delivers neutral effects in expectation. Corollary 3 highlights that the government requires more positively

than negatively polarized voters to gain from polarization given the assumption that the parameter λ exceeds 1. Due to higher competition by profiteers, polarization can be disadvantageous for the opposition despite the effect from the government side leading to a summand bigger than 1. The direction of the gross effect of polarization depends on the second summand, which covers the effects from the profiteer side. I analyze the latter effects and their implications henceforth.

While the first summand, depicting the effects of polarization on the convincing power of the government, is the same across swing voter types and party blocs and fixed at the parameter of the negativity bias λ, the second summand varies a lot across swing voter types. For swing voters of type T^O, the ratios constituting this summand are equal to 1, which has already explained above. On the contrary, swing voters of types T^G and T^P feature summands including all three probabilities to get a high payoff. As shown previously, the numerators depict the effects induced by polarization on the side of profiteers and the denominators denote the pure effect of negative polarization on the convincing power of the government. This implies that the latter effect scales the first effect. In case the effect from the side of the government is relatively stronger than the effect stemming from profiteers, the summand is relatively low and vice versa. Having grasped the mechanism behind the second summand, it is then essential to study how each probability affects each effect and therefore also the aforementioned mechanism. From the analysis above, it is clear that both the government and opposition prefer low magnitudes of the second summand, implying a low influence of the effect stemming from profiteers. Profiteers are better off with a high effect from their side. Further, considering that low thresholds $\hat{\theta}^i_{\varphi^j}$ are favorable for the government and high thresholds $\hat{\theta}^i_{\varphi^j}$ advantageous for the opposition and profiteers, the influence of probabilities on thresholds can be summarized as follows:

Corollary 4 *For swing voters of type T^G the opposition is relatively better off if they and the government are likelier and profiteers less likely to satisfy T^G. Favorable conditions for profiteers are also high h^G_O and low h^G_P, but low h^G_G. For swing voters of type T^P, the government is relatively better off in case they and profiteers are less likely and the opposition likelier to satisfy T^P. For the opposition, advantageous conditions are also low h^P_P, but low h^P_O and high h^P_G.*

The first part of Corollary 4, which elaborates on thresholds $\hat{\theta}^i_{\varphi^G}$, can be explained intuitively this way: If the opposition has high chances to satisfy the underlying swing voters and profiteers do not, the first is able to withstand the increased competitiveness of profiteers, which is embodied by the second summand, the best. Yet, profiteers gain in relative terms most competitive

strength if these conditions on probabilities are met. There is a difference in preferences for the binding power of the government for their prior voters, though. Profiteers can employ their increased competitive power the most if there are more swing voters of T^G, which pertains if the government probably discontents its previous voters. The opposite is true for the opposition. This bloc is protected by a strong government from the adverse effect of more appealing profiteers. In other words, the opposition can lose less swing voters to profiteers if there are not many swing voters, which applies if the government tends to bind its prior voters.

For the second part of Corollary 4, covering characteristics of thresholds $\hat{\theta}^i_{\varphi^P}$, another perspective is required since swing voters shift from profiteers here, whose binding power is increased within the regarded effect in the second summand. Both the government and opposition suffer the least from strengthened profiteers in case these are per se weak. This is due to the fact that the relative decrease in expected swing voters of type T^P is more pronounced for stronger profiteers. The disadvantageous effect of stronger profiteers, resulting in less swing voters, is minimized for each the government and opposition if their competitiveness is relatively low compared to the convincing power of the respective opponent. Another short and precise interpretation of this mechanism is that both the government and the opposition suffer the less from an increase in the binding power of profiteers the lower their potential to gain swing voters of type T^P is per se.

The highest effects of the second summands on thresholds $\hat{\theta}^i_{\varphi^j}$ are already depicted in Corollary 1. These show that very strong effects of polarization on the strength of profiteers can render conditions to profit from the respective swing voter channels very restrictive for the government and opposition and very relaxed for profiteers. This is especially noteworthy for the case of the opposition because their convincing power is not affected by polarization.

The effects of polarization on differences in expected core voter shares can be grasped concerning satisficing under multiple payoffs, which implicates that voters decide for their previous bloc again if they are content with it. For the government, this means that the stronger effect of negative polarization compared to positive polarization has to be offset by sufficiently more positively polarized voters. This mechanism is identical to the first summand of swing voter thresholds $\hat{\theta}^i_{\varphi^j}$. Because the binding power of the opposition is not affected by polarization, there is no difference in expected core voter shares for this bloc. Polarization unambiguously increases the binding power of profiteers for negatively polarized voters, leading to higher expected core voter shares.

Swing voter channels described in Proposition 2 increase in the parameter of polarization Δh with few exceptions. Intuitively, the stronger an event polarizes, the more voters of an electorate change their opinion about the performance of parties. Thus, stronger effects for electoral results can be expected. Exceptions are swing voter channels of type T^P and the swing voter channel of type T^G for the opposition. Recalling from previous analysis, these are swing voter channels characterized by disadvantageous effects from the increased strength of profiteers. For these channels, marginal effects of polarization are positive except for cases in which $\lambda\Delta h$[6] is very high so that this term exceeds the magnitude of the entire channel. Additionally, these cases require low competitiveness by the considered bloc compared to the competitor and few expected swing voters.

3.4 Extension

The basic model excludes non-voters and the opportunity to abstain in general. Voter turnout and polarization are related, though, which has been demonstrated by a large body of literature (e.g. Lachat, 2008, Steiner and Martin, 2012, Moral, 2017, Wilford, 2017). Recent electoral results also suggest that polarization can affect voter turnout. For instance, voter turnout increased from 71.5 % to 76.2 % in Germany in 2017. In addition, there is evidence that populist parties enjoy substantial gains from prior non-voters. The Alternative für Deutschland earned around 35 % of their total share of 12.6 % from previous non-voters in the German national election in 2017 (Hilmer and Gagné, 2017, Pickel, 2019). To account for non-voting, I now allow for a fourth voter type, which comprises all voters who did not vote in period 1. It is denoted by T^{NV} and its respective share is φ^{NV}. To ensure the majority of the government, voter shares from period 1 have to be such that $\varphi^G > \frac{1}{2}(1-\varphi^{NV})$. Non-voters, like all other voter types, obtain a payoff by each of the blocs G, O and P. Non-polarized non-voters gain a high payoff by each bloc i with probability h_i^{NV}. Changes for polarized voters are as for polarized voters of other types. Non-voting itself does not yield a payoff as the "non-voting bloc" is not a politically active bloc. Non-voters also apply satisficing under multiple payoffs for the election in period 2. Importantly, Criterion 3 of Definition 1 is changed in a way that an arbitrary voter decides for a bloc not generating a payoff instead of a bloc also yielding a low payoff. Additionally, up to three blocs may meet Criterion 2. These are then again selected with equal probability. From these adaptions of the decision rule and the introduction of non-voting there are implications for all voter types.

[6] This term stems from terms $\frac{1}{2}\lambda\Delta h^2$ when negative polarization on the government side and the positive effect of polarization for profiteers are multiplied.

Corollary 5 *Voters only abstain from voting in period* 2 *iff all blocs yield low payoffs.*

Corollary 5 is a direct result of the assumption that there is no payoff from non-voting. Further, it indicates that non-voting is the result of a single reason: Voters who are disappointed by all parties opt for a neutral alternative, which they find in non-voting. Other motives for abstaining from election do not exist in the model. Although there is empirical evidence of additional causes for non-voting, such as political ignorance, indifference, selective awareness and conditional inactivity (Ragsdale and Rusk, 1993), there are two reasons why the model by its nature draws a realistic picture why voters abstain. Firstly, there is huge body of empirical literature on non-voting and voter turnout implying that discontent with political parties accounts for a large share of non-voters (e.g. Pammett and LeDuc, 2003, Hooghe et al., 2011, Kemmers, 2017, Rich and Treece, 2018). Secondly, except for indifference, the additional causes for non-voting are excluded by assumption. Therefore, the model is neither imprecise nor specified incorrectly, but to some extent limited as not all reasons are covered. Within scope, the model comprises the main reason for abstention, dissatisfaction, adequately and precisely.

Using all assumptions and Corollary 5, the decision table for a three-party setting and including non-voters is as follows:

Voter type / Decision for	T^G	T^O	T^P	T^{NV}
Government bloc G	$H,*,*$	H,L,L $\frac{1}{2}(H,L,H)$	H,L,L $\frac{1}{2}(H,H,L)$	H,L,L $\frac{1}{2}(H,H,L)$ $\frac{1}{2}(H,L,H)$ $\frac{1}{3}(H,H,H)$
Opposition bloc O	L,H,L $\frac{1}{2}(L,H,H)$	$*,H,*$	L,H,L $\frac{1}{2}(H,H,L)$	L,H,L $\frac{1}{2}(H,H,L)$ $\frac{1}{2}(L,H,H)$ $\frac{1}{3}(H,H,H)$
Profiteer bloc P	L,L,H $\frac{1}{2}(L,H,H)$	L,L,H $\frac{1}{2}(H,L,H)$	$*,*,H$	L,L,H $\frac{1}{2}(H,L,H)$ $\frac{1}{2}(L,H,H)$ $\frac{1}{3}(H,H,H)$
Abstention from voting	L,L,L	L,L,L	L,L,L	L,L,L

Table 4: Voter decision table allowing for non-voting

The expected voter shares for all blocs including and neglecting polarization can be found in the appendix.

Analogous to prior analysis, I analyze the marginal effects of the negativity bias and differences in expected voter shares with and without polarization. Hereby, the insights from Corollary 5 play an important role and unveil relations to the analogous parts of the three-bloc case.

Proposition 3 (Marginal effects of the negativity bias) *Allowing for non-voting, marginal effects of the negativity bias are as follows:*

1. *For the government, there is a negative effect from all voter types.*
2. *The opposition enjoys positive effects from voter types T^G, T^P and T^{NV}.*
3. *There are positive effects from types T^G, T^O and T^{NV} for the profiteer bloc.*
4. *There are more expected non-voters from all types for an increase in λ.*

Effects across voter types stem from negatively polarized voters and add up to 0*. The magnitude of the effects for blocs O and P increase in their own probability to satisfy voters. Apart from this effect and the effect of voter type T^G on bloc G, all magnitudes increase in the probability to be discontent with blocs O and P.*

The mechanisms behind Proposition 3 are the same as for Proposition 1. An electorate more focused on the negative leads to more voters disappointed by the government. This engenders not only more potential swing voters heading for the opposition and profiteers, but also leads to more non-voters in expectation. As outlined in Corollary 5, an arbitrary voter only abstains from voting in case all blocs dissatisfy, which is fostered by a higher negativity bias. Corollary 5 also accounts for the fact that channels resulting in non-voting increase in the chances that opposition and profiteers disappoint voters. The lower the convincing power of these blocs is, the lower is voter turnout in expectation. On the contrary, attractive opposition and profiteers are able to capitalize on the increased number of disappointed voters, enticing these with a good performance and thus ensure that the decrease in voter turnout is less pronounced.

In addition to marginal effects of the negativity bias including non-voters, the results for differences in expected voter shares can be summarized as follows:

Proposition 4 (Differences in expected voter shares) *Including non-voters, there are again critical thresholds $\hat{\theta}^i_{\varphi^j}$ for swing voter channels, at which differences in expected voter shares are* 0*. The government enjoys*

expected gains in voter shares under polarization from swing voter channels iff the corresponding ratio of positively and negatively polarized voters, θ_{φ^j}, exceeds thresholds $\hat{\theta}^i_{\varphi^j}$. All other blocs profit from polarization if and only if θ_{φ^j} is lower than $\hat{\theta}^i_{\varphi^j}$. Thresholds can be written as in Table 5:

Voter type / Party bloc	T^G	T^O	T^P	T^{NV}
Government bloc G	No swing voters	$\hat{\theta}^G_{\varphi^O} = \lambda + \frac{h^O_G - \lambda\Delta h}{2 - h^O_P}$	$\hat{\theta}^G_{\varphi^P} = \lambda + \frac{h^P_G - \lambda\Delta h}{1 - h^P_P}$	$\hat{\theta}^G_{\varphi^{NV}} = \lambda + \frac{(1-\frac{2}{3}h^{NV}_O)(h^{NV}_G - \lambda\Delta h)}{(1-\frac{2}{3}h^{NV}_O)(1-\frac{1}{2}h^{NV}_P)+\frac{1}{3}h^{NV}_O}$
Opposition bloc O	$\hat{\theta}^O_{\varphi^G} = \lambda - \frac{1 - h^G_G + \lambda\Delta h}{2 - h^G_P}$	No swing voters	$\hat{\theta}^O_{\varphi^P} = \lambda - \frac{2 - h^P_G + \lambda\Delta h}{1 - h^G_P}$	$\hat{\theta}^O_{\varphi^{NV}} = \lambda - \frac{1 - \frac{2}{3}h^{NV}_G + \frac{2}{3}\lambda\Delta h}{1 - \frac{2}{3}h^{NV}_P}$
Profiteer bloc P	$\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1 - h^G_G + \lambda\Delta h}{h^G_P}$	$\hat{\theta}^P_{\varphi^O} = \lambda + \frac{2 - h^O_G + \lambda\Delta h}{h^O_P}$	No swing voters	$\hat{\theta}^P_{\varphi^{NV}} = \lambda + \frac{2 - h^{NV}_G + \lambda\Delta h}{h^{NV}_P} + \frac{h^{NV}_O}{h^{NV}_P(3 - 2h^{NV}_O)}$
Non-voter bloc NV	$\hat{\theta}^{NV}_{\varphi^G} = \lambda - \frac{1 - h^G_G + \lambda\Delta h}{1 - h^G_P}$	$\hat{\theta}^{NV}_{\varphi^O} = \lambda - \frac{1 - h^O_G + \lambda\Delta h}{1 - h^O_P}$	$\hat{\theta}^{NV}_{\varphi^P} = \lambda - \frac{1 - h^P_G + \lambda\Delta h}{1 - h^P_P}$	No swing voters

Table 5: Differences in expected voter shares allowing for non-voters

The government binds more core voters under polarization iff $\theta_{\varphi^G} > \lambda$ and profiteers bind unequivocally more voters $\varphi^P_- \Delta h > 0$. More non-voters abstain again in expectation if and only if $\hat{\theta}^{NV}_{\varphi^{NV}} = \lambda - \frac{1 - h^{NV}_G + \lambda\Delta h}{1 - h^{NV}_P}$ and there is no effect on core voters of the opposition.

Intervals for $\hat{\theta}^i_{\varphi^j}$ can be found in the appendix. The introduction of non-voting does not elicit new mechanisms regarding differences in expected voter shares for the three party blocs and their respective voter type from the basic setting. There is a fixed parameter in thresholds $\hat{\theta}^i_{\varphi^j}$ stemming from the changes in the chances of the government to satisfy voters, which is the parameter of the negativity bias λ. The second summands are a ratio of the positive effect of polarization on the convincing power of profiteers and the respective negative effect for the government on negatively polarized voters. Notably, all of these are independent of the probability to receive a high payoff by the opposition, as these terms cancel out. This finding can be ascribed to the neutral role of the opposition concerning the effects of polarization in this summand. First, the convincing power of the opposition is not affected by polarization and second, the opportunity to abstain from voting is utilized by all voters who are disappointed by all blocs. Additionally, the mechanisms carry over to prior non-voters T^{NV}, except for

the independence of the competitiveness of the opposition. The government faces stricter restrictions to gain more non-voters in expectation due to polarization, while conditions are strictly looser for the profiteers. For the opposition, both distinguishable effects of polarization work in different directions, leading to different signs of summands.

The thresholds $\hat{\theta}^{NV}_{\varphi^j}$ for the "non-voting bloc" are of identical structure for each voter type T^j as all types only abstain iff they are discontent with all blocs. Moreover, the effects behind thresholds $\hat{\theta}^{NV}_{\varphi^j}$ point in the same direction as the respective thresholds for the opposition. Both the opposition and non-voting are in a sense neutral to polarization that their chances to convince voters are not altered. Thus, thresholds $\hat{\theta}^{NV}_{\varphi^j}$ hint at lower voter turnouts or a stronger "non-voting bloc" if polarization effects on the government are high and respective effects on profiteers are low. In this sense, a relatively strong effect of polarization on the attractiveness of profiteers can protect from lower voter turnouts due to polarization. This pertains especially for a per se strong government and poor profiteers, depicted by high h^j_G and low h^j_P, so that an increase in the profiteers' appeal has a maximized impact. Notably, thresholds for the opposition and non-voting are of the same structure concerning the direction of each of the two effects. This hints at some relation between e.g. gains for the opposition and a decrease in voter turnout. The different second summands account for different magnitudes of the second effects, though. Finally, Corollaries 2 and 3 can be generalized to the introduction of non-voters, with the implications for the "non-voting bloc" being identical to those of the opposition.

3.5 Discussion

Elections are often characterized by significant voter shifts. Literature has convincingly shown that retrospective voting matters when voters have to decide what party to support. Albeit various approaches to retrospective voting exist, these models cannot explain properly why incumbents lost significant shares and many opposition parties did not take advantage of these losses, while some specific parties, especially right populist ones, did so. This pattern was prevalent in many national elections in Europe during the last decade. In order to fill this gap, my paper incorporates polarization and the negativity bias into retrospective voting to examine the effects of polarizing events within two election periods in a three-bloc setting. In line with empirical literature, all of these blocs can satisfy voters but are subject to an exogenous polarizing event in different ways. Extending satisficing to a decision rule for multiple payoffs, my framework enables distinctions in the evaluation of different blocs and therefore a precise analysis of the voters' decision process also including non-voting. With these features, my model yields insights about the effects of polarization and the negativity bias

on voting behavior with a strong emphasis on bloc-specific evaluations and voter shifts. Thus, it is an additional approach to existing theoretical models of retrospective voting (e.g. Bendor et al., 2011, Bischoff and Siemers, 2013, Esponda and Pouzo, 2017).

The analysis of the basic three-bloc framework reveals a rich set of results. A study of marginal effects of the negativity bias shows that the government strictly loses voter shares from all types if the electorate is more focused on the negative. Both the opposition and profiteers enjoy gains in expected swing voter shares, with the magnitude of these channels depending on their own relative competitive power.

An analysis of the differences in expected voter shares with and without polarization shows that the different impacts of polarization on the strength of the government and profiteers can be separated. The relation of the magnitudes of the effects of polarization on the chance of the government to content polarized voters accounts for the first effect. Moreover, there is an effect stemming from the increase in convincing power of profiteers for negatively polarized voters. There is a key difference between these effects: The first one contributes a constant parameter to sign-changing thresholds of positively and negatively polarized voters, given that the negativity bias does not change over time. The second one is a fraction of probabilities to satisfy voters, which can generally rather be considered variable over time (Bendor et al., 2011). Both effects impair the conditions for the government to profit from polarization while they loosen the respective conditions for profiteers. For the opposition, the effects work in opposite directions as the governmental effect is per se advantageous for low ratios, but the increase in the convincing power of profiteers lowers their relative competitiveness regarding swing voters. The detrimental impact of the latter effect is less severe for both government and opposition if their chances to entice swing voter types are small per se. Thus, higher competition by profiteers harms strong governments and oppositions harder. Regarding core voters, the restriction for the government to be better off under polarization comprises the effect of polarization on the own binding power, whereas profiteers keep unequivocally more core voter shares under polarization.

There are also insights about how the own ability to bind and convince voters affects the sign of the differences in expected swing voter shares, or, put differently, whether blocs with a specific competitive power are more or less subject to losses or gains due to polarization. Both the government and the opposition rather incur less expected swing voter shares if their relative competitive power compared to the respective competitor is high. Interpreted vice versa, government and opposition can be protected by a strong opponent from expected losses to some extent as the variable effect of the

increase in the strength of profiteers is then less dominant. On the contrary, conditions for profiteers to profit from polarization are even more favorable if their general convincing power is low. In this case, the relative increase from polarization works the most.[7] Magnitudes of swing voter channels generally increase in the degree of polarization. Intuitively, stronger polarization causes more significant effects on the competitive power of parties. Therefore, more voters are induced to decide differently in the presence of polarization.

Introducing non-voters substantiates the robustness of the results derived in the basic case. In fact, all results and mechanisms regarding the three electable blocs and their respective types carry over to this setting. For all non-voter channels, including prior non-voters, the conditions to be higher than in the absence of polarization follow the same mechanisms as swing voter channels for the opposition. The similarity to conditions for the opposition is due to the fact that polarization affects neither the probability to be satisfied with the opposition nor the absence of a payoff of non-voting. Thus, the effect from the government side induces more voters both to shift to the opposition and not to vote as long as voter types feature sufficient negatively polarized voters. Additionally, the higher strength of profiteers due to polarization deteriorates the chances of the opposition to entice swing voters and keeps more disappointed voters from non-voting. Contrarily to the basic case, a strong opposition cannot protect the government from disadvantageous conditions. The opposite effect holds, though, and also applies to non-voters, meaning that a strong government engenders declines in voter turnout. Moreover, weak profiteers and a higher negativity bias lead to a prevalence of abstention as well. With a strong government and poor performing profiteers, the increase in the convincing power of the latter tends not to mobilize enough voters to outweigh the decreasing effect of polarization from the government side on voter turnout, especially if the electorate is heavily focused on the negative. In case the opposition cannot attract many swing voters neither, the magnitudes of voter channels that abstain due to polarization are maximized. Interestingly, the conditions on core voters of the three electable blocs only depend on the effect of polarization on the own binding power, yielding the same results as in the basic setting.

Consequently, the model provides a testable theoretical explanation for the pattern of the characteristic voter shifts in Europe. While the effects of polarization on the competitiveness of the government were disadvantageous for itself and profitable for the opposition and profiteers, the increased

[7] The magnitude of expected swing voter channels is yet higher for strong profiteers, because they are then per se more appealing to voters. This measure has to be considered separately from the thresholds deciding whether polarization is in expectation advantageous for profiteers.

strength of profiteers prevented opposition parties from capitalizing, while they gained even more voter shares themselves. The large gains by profiteers and mixed results for the opposition hint at profiteers that would not have been likely to satisfy voters without polarization. Profiteers therefore benefited from the increase in strength from polarization, especially in the competition against the opposition. To test this hypothesis, the parameters of the model have to be obtained. At this, the parameter of loss aversion can be used for the parameter of the negativity bias. Research on this topic includes measures for a large number of areas, including money (e.g. Kahneman and Tversky, 1991, Abdellaoui et al., 2007, Abdellaoui et al., 2008, Bacova et al., 2013, Karle et al., 2015). The contexts of research cover a vast number of fields, including money (e.g. Kahneman and Tversky, 1991, Abdellaoui et al., 2008, Wang et al., 2017), health (Bleichrodt et al., 2001), consumer behavior (Karle et al. 2015) and renewable energy (Bartczak et al., 2017). Although political matters are so far neglected, this pool of estimations most probably yields an appropriate value for the negativity bias, because the mean of the parameter for loss aversion is similar across topics. There are huge differences across countries, though (Wang et al., 2017), which may also provide an explanation why voter shifts may differ a lot between elections. Two additional parameters are needed to calculate these shifts. First, the degree of polarization has to be determined. Second, the probability to receive a high payoff by each parliamentary bloc is required. While the latter can be estimated using long-term data depicting the satisfaction of voters with each party, the estimation of the first may be enabled checking for positive changes in satisfaction due to the polarizing event.[8]

In general, the model emphasizes the importance of polarizing events for electoral outcomes. This is especially remarkable considering that these events may be beyond the control of the government (e.g. Achen and Bartels, 2004). Consequently, the government may lose significant shares due to an event it might not be responsible for. Similarly, the negativity bias, which lowers voter shares of all types for the government, is neither in the hands of the latter, but a psychological phenomenon. On the opposite, both the opposition and profiteers take advantage of a stronger bias, especially if they possess a high potential to convince swing voters. Even more importantly, this decreases voter turnout at the same time with the highest effects if both opposition and profiteers are weak.

These results may serve as an alternative starting point in empirical research on retrospective voting. While economic measures are used frequently

[8] Focusing on negative changes in satisfaction would also incorporate the negativity bias, according to my framework. Thus, using data about positive changes is more appropriate to check for the degree of polarization. Yet, knowing this parameter, checking for negative changes can then yield information about the parameter of the negativity bias.

as performance indicators (e.g. Lewis-Beck and Stegmaier, 2000, Campbell et al., 2010, Plescia and Kritzinger, 2017), there is also newer literature extending the array of possible performance measures (e.g. de Vries and Giger, 2014, Liberini et al., 2017, Reny et al., 2019). Additionally, as outlined above, it is important to consider shocks to the chances of several parties to satisfy voters. More specifically, the general satisfaction with different parties or blocs and the source of shocks to content may well explain how voter shifts emerge. Moreover, it is critical to include effects on profiteers that may be non-parliamentary or stand for election for the first time. The majority of empirical literature focusses only on performance by the government or by parliamentary parties, which may be insufficient. In light of these modifications, empirical analysis of elections during or subsequent to e.g. the refugee crisis can provide more precise and comprising explanations of the electoral outcomes. Moreover, the set of results and relations of voter channels on bloc level from this theoretical model can be substantiated.

Besides the effects on electoral results and their respective nature, there are also insights from the framework especially for areas intersecting with voting behavior. For instance, the numbers of positively and negatively polarized voters as well as the degree of polarization are treated as exogenously given, allowing for the analysis of a fixed state. Assumptions on the process leading to the specific shares of polarized voters are not made. Since these play an important role, understanding the nature of polarization in an electorate is key. Presenting the polarizing event and the response of the government in different ways can be one piece of this explanation, hinting at the important role of framing in politics (e.g. Porto, 2007, Slothuus and de Vreese, 2010, Hullman and Diakopoulos, 2011, Elias et al., 2015, Vliegenhart et al., 2016). Within this research area, a stronger focus on the role of political campaigns and media is revealing, notably concerning populist parties. Therefore, the increase in work on these fields (e.g. Schmuck and Matthes, 2017, Bali et al., 2018, Barrio et al., 2018, Marozzo and Bessi, 2018, Silva, 2018) is supported by this paper.

Rendering polarization and polarized voters endogenously alterable variables makes these a strategic area parties might exploit. While the government always prefers more positively polarized voters and both opposition and profiteers unequivocally profit from a higher share of negatively polarized voters, their respective preferences for the degree of polarization are ambiguous. My model delivers an overview on the expected effects of polarization, which vary a lot due to the effects of the increase in convincing power of profiteers. Depending on the sign of expected effects, a bloc has an incentive to decrease or increase the degree of polarization. While the model answers the question when which incentive is valid, the question how to act accordingly is beyond its explanatory power. The aforementioned areas of framing and

campaigning already yield several ways to engender polarization, but approaches to mitigate it are relatively unexplored. The establishment of fact checking measures can reduce misinformation and thus polarization. The evidence of its efficacy is yet mixed. Some studies suggest that fact-checking enhances informativeness and lowers polarization (e.g. Wintersieck, 2017, Hameleers and Meer, 2020), whereas other literature shows that the effects are very limited in terms of duration (e.g. Swire et al., 2017) and selective exposure of voters (e.g. Shin and Thorson, 2017, Margolin et al., 2018).

Apart from potential disadvantageous regarding electoral outcomes, there are also other reasons why polarization should be diminished, especially from the perspective of the government. Different fields of research stress that polarization can have detrimental effects, e.g. decreasing economic growth due to impaired social cohesion (Goldschmidt and Wohlgemuth, 2004, Ager and Brückner, 2013, Aisen and Veiga, 2013, Goldschmidt, 2014, Pervaiz and Chaudhary, 2015) and boosted potential for conflicts in society (e.g. Esteban and Ray, 2011, Montalvo and Reynal-Querol, 2012, Abu-Bader and Ianchovichina, 2019). Consequently, there are issues far beyond electoral outcomes that have to be taken into consideration in the presence of polarization. This pertains especially if polarization is exploited as a strategy. These subsequent questions as well as the abovementioned avenues are left for future research.

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Appendix

Expected voter shares without and with polarization

Section 3.3: Basic case without non-voters

$$V_G^{NPC} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)h_G^G$$

$$+(\varphi_N^O + \varphi_+^O + \varphi_-^O)(1-h_O^O)(h_G^O(1-h_P^O) + \tfrac{1}{2}h_G^O h_P^O + \tfrac{1}{2}(1-h_G^O)(1-h_P^O))$$

$$+(\varphi_N^P + \varphi_+^P + \varphi_-^P)(1-h_P^P)(h_G^P(1-h_O^P) + \tfrac{1}{2}h_G^P h_O^P + \tfrac{1}{2}(1-h_G^P)(1-h_O^P))$$

$$V_G^{PC} = \varphi_N^G h_G^G + \varphi_+^G(h_G^G + \Delta h) + \varphi_-^G(h_G^G - \lambda\Delta h)$$

$$+\varphi_N^O(1-h_O^O)(h_G^O(1-h_P^O) + \tfrac{1}{2}h_G^O h_P^O + \tfrac{1}{2}(1-h_G^O)(1-h_P^O))$$

$$+\varphi_+^O(1-h_O^O)((h_G^O+\Delta h)(1-h_P^O) + \tfrac{1}{2}(h_G^O+\Delta h)h_P^O + \tfrac{1}{2}(1-h_G^O-\Delta h)(1-h_P^O))$$

$$+\varphi_-^O(1-h_O^O)((h_G^O - \lambda\Delta h)(1-h_P^O-\Delta h)$$

$$+\tfrac{1}{2}(h_G^O - \lambda\Delta h)(h_P^O+\Delta h) + \tfrac{1}{2}(1-h_G^O+\lambda\Delta h)(1-h_P^O-\Delta h))$$

$$+\varphi_N^P(1-h_P^P)(h_G^P(1-h_O^P) + \tfrac{1}{2}h_G^P h_O^P + \tfrac{1}{2}(1-h_G^P)(1-h_O^P))$$

$$+\varphi_+^P(1-h_P^P)((h_G^P+\Delta h)(1-h_O^P) + \tfrac{1}{2}(h_G^P+\Delta h)h_O^P + \tfrac{1}{2}(1-h_G^P-\Delta h)(1-h_O^P))$$

$$+\varphi_-^P(1-h_P^P-\Delta h)$$

$$((h_G^P - \lambda\Delta h)(1-h_O^P) + \tfrac{1}{2}(h_G^P - \lambda\Delta h)h_O^P + \tfrac{1}{2}(1-h_G^P+\lambda\Delta h)(1-h_O^P))$$

$$V_O^{NPC} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)(h_O^G(1-h_P^G) + \tfrac{1}{2}h_O^G h_P^G + \tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+(\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+(\varphi_N^P + \varphi_+^P + \varphi_-^P)(1-h_P^P)((1-h_G^P)h_O^P + \tfrac{1}{2}h_G^P h_O^P + \tfrac{1}{2}(1-h_G^P)(1-h_O^P))$$

$$V_O^{PC} = \varphi_N^G(1-h_G^G)(h_O^G(1-h_P^G) + \tfrac{1}{2}h_O^G h_P^G + \tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+\varphi_+^G(1-h_G^G-\Delta h)(h_O^G(1-h_P^G) + \tfrac{1}{2}h_O^G h_P^G + \tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+\varphi_-^G(1-h_G^G-\lambda\Delta h)(h_O^G(1-h_P^G-\Delta h)+\tfrac{1}{2}h_O^G(h_P^G+\Delta h)+\tfrac{1}{2}(1-h_O^G)(1-h_P^G-\Delta h))$$

$$+(\varphi_N^O + \varphi_+^O + \varphi_-^O)h_O^O$$

$$+\varphi_N^P(1-h_P^P)((1-h_G^P)h_O^P+\tfrac{1}{2}h_G^Ph_O^P+\tfrac{1}{2}(1-h_G^P)(1-h_O^P))$$

$$+\varphi_+^P(1-h_P^P)((1-h_G^P-\Delta h)h_O^P+\tfrac{1}{2}(h_G^P+\Delta h)h_O^P+\tfrac{1}{2}(1-h_G^P-\Delta h)(1-h_O^P))$$

$$+\varphi_-^P(1-h_P^P-\Delta h)$$

$$((1-h_G^P+\lambda\Delta h)h_O^P+\tfrac{1}{2}(h_G^P-\lambda\Delta h)h_O^P+\tfrac{1}{2}(1-h_G^P+\lambda\Delta h)(1-h_O^P))$$

$$V_P^{NPC}=(\varphi_N^G+\varphi_+^G+\varphi_-^G)(1-h_G^G)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^Gh_P^G+\tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+(\varphi_N^O+\varphi_+^O+\varphi_-^O)(1-h_O^O)((1-h_G^O)h_P^O+\tfrac{1}{2}h_G^Oh_P^O+\tfrac{1}{2}(1-h_G^O)(1-h_P^O))$$

$$+(\varphi_N^P+\varphi_+^P+\varphi_-^P)h_P^P$$

$$V_P^{PC}=\varphi_N^G(1-h_G^G)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^Gh_P^G+\tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+\varphi_+^G(1-h_G^G-\Delta h)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^Gh_P^G+\tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+\varphi_-^G(1-h_G^G+\lambda\Delta h)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^Gh_P^G+\tfrac{1}{2}(1-h_O^G)(1-h_P^G))$$

$$+\varphi_N^O(1-h_O^O)((1-h_G^O)h_P^O+\tfrac{1}{2}h_G^Oh_P^O+\tfrac{1}{2}(1-h_G^O)(1-h_P^O))$$

$$+\varphi_+^O(1-h_O^O)((1-h_G^O-\Delta h)h_P^O+\tfrac{1}{2}(h_G^O+\Delta h)h_P^O+\tfrac{1}{2}(1-h_G^O-\Delta h)(1-h_P^O))$$

$$+\varphi_-^O(1-h_O^O)((1-h_G^O+\lambda\Delta h)(h_P^O+\Delta h)$$

$$+\tfrac{1}{2}(h_G^O-\lambda\Delta h)(h_P^O+\Delta h)+\tfrac{1}{2}(1-h_G^O+\lambda\Delta h)(1-h_P^O-\Delta h))$$

$$+(\varphi_N^P+\varphi_+^P)h_P^P+\varphi_-^P(h_P^P+\Delta h)$$

Extension allowing for non-voters

$$V_G^{NPC}=(\varphi_N^G+\varphi_+^G+\varphi_-^G)h_G^G$$

$$+(\varphi_N^O+\varphi_+^O+\varphi_-^O)(1-h_O^O)(h_G^O(1-h_P^O)+\tfrac{1}{2}h_G^Oh_P^O)$$

$$+(\varphi_N^P+\varphi_+^P+\varphi_-^P)(1-h_P^P)(h_G^P(1-h_O^P)+\tfrac{1}{2}h_G^Ph_O^P)$$

$$+(\varphi_N^{NV}+\varphi_+^{NV}+\varphi_-^{NV})(h_G^{NV}(1-h_O^{NV})(1-h_P^{NV})$$

$$+\tfrac{1}{2}h_G^{NV}h_O^{NV}(1-h_P^{NV})+\tfrac{1}{2}h_G^{NV}(1-h_O^{NV})h_P^{NV}+\tfrac{1}{3}h_G^{NV}h_O^{NV}h_P^{NV})$$

$$V_G^{PC} = \varphi_N^G h_G^G + \varphi_+^G (h_G^G + \Delta h) + \varphi_-^G (h_G^G - \lambda \Delta h)$$

$$+\varphi_N^O (1 - h_O^O)(h_G^O (1 - h_P^O) + \tfrac{1}{2} h_G^O h_P^O)$$

$$+\varphi_+^O (1 - h_O^O)((h_G^O + \Delta h)(1 - h_P^O) + \tfrac{1}{2}(h_G^O + \Delta h) h_P^O)$$

$$+\varphi_-^O (1 - h_O^O)((h_G^O - \lambda \Delta h)(1 - h_P^O - \Delta h) + \tfrac{1}{2}(h_G^O - \lambda \Delta h)(h_P^O + \Delta h))$$

$$+\varphi_N^P (1 - h_P^P)(h_G^P (1 - h_O^P) + \tfrac{1}{2} h_G^P h_O^P)$$

$$+\varphi_+^P (1 - h_P^P)((h_G^P + \Delta h)(1 - h_O^P) + \tfrac{1}{2}(h_G^P + \Delta h) h_O^P)$$

$$+\varphi_-^P (1 - h_P^P - \Delta h)((h_G^P - \lambda \Delta h)(1 - h_O^P) + \tfrac{1}{2}(h_G^P - \lambda \Delta h) h_O^P)$$

$$+\varphi_N^{NV} (h_G^{NV} (1 - h_O^{NV})(1 - h_P^{NV})$$

$$+\tfrac{1}{2} h_G^{NV} h_O^{NV} (1 - h_P^{NV}) + \tfrac{1}{2} h_G^{NV} (1 - h_O^{NV}) h_P^{NV} + \tfrac{1}{3} h_G^{NV} h_O^{NV} h_P^{NV})$$

$$+\varphi_+^{NV} ((h_G^{NV} + \Delta h)(1 - h_O^{NV})(1 - h_P^{NV}) + \tfrac{1}{2}(h_G^{NV} + \Delta h) h_O^{NV} (1 - h_P^{NV})$$

$$+\tfrac{1}{2}(h_G^{NV} + \Delta h)(1 - h_O^{NV}) h_P^{NV} + \tfrac{1}{3}(h_G^{NV} + \Delta h) h_O^{NV} h_P^{NV})$$

$$+\varphi_-^{NV} ((h_G^{NV} - \lambda \Delta h)(1 - h_O^{NV})(1 - h_P^{NV} - \Delta h)$$

$$+\tfrac{1}{2}(h_G^{NV} - \lambda \Delta h) h_O^{NV} (1 - h_P^{NV} - \Delta h) + \tfrac{1}{2}(h_G^{NV} - \lambda \Delta h)(1 - h_O^{NV})(h_P^{NV} + \Delta h)$$

$$+\tfrac{1}{3}(h_G^{NV} - \lambda \Delta h) h_O^{NV} (h_P^{NV} + \Delta h))$$

$$V_O^{NPC} = (\varphi_N^G + \varphi_+^G + \varphi_-^G)(1 - h_G^G)(h_O^G (1 - h_P^G) + \tfrac{1}{2} h_O^G h_P^G)$$

$$+(\varphi_N^O + \varphi_+^O + \varphi_-^O) h_O^O$$

$$+(\varphi_N^P + \varphi_+^P + \varphi_-^P)(1 - h_P^P)((1 - h_G^P) h_O^P + \tfrac{1}{2} h_G^P h_O^P)$$

$$+ (\varphi_N^{NV} + \varphi_+^{NV} + \varphi_-^{NV})((1 - h_G^{NV}) h_O^{NV} (1 - h_P^{NV})$$

$$+\tfrac{1}{2} h_G^{NV} h_O^{NV} (1 - h_P^{NV}) + \tfrac{1}{2}(1 - h_G^{NV}) h_O^{NV} h_P^{NV} + \tfrac{1}{3} h_G^{NV} h_O^{NV} h_P^{NV})$$

$$V_O^{PC} = \varphi_N^G(1-h_G^G)(h_O^G(1-h_P^G)+\tfrac{1}{2}h_O^G h_P^G)$$

$$+\varphi_+^G(1-h_G^G-\Delta h)(h_O^G(1-h_P^G)+\tfrac{1}{2}h_O^G h_P^G)$$

$$+\varphi_-^G(1-h_G^G+\lambda\Delta h)(h_O^G(1-h_P^G-\Delta h)+\tfrac{1}{2}h_O^G(h_P^G+\Delta h))$$

$$+(\varphi_N^O+\varphi_+^O+\varphi_-^O)h_O^O$$

$$+\varphi_N^P(1-h_P^P)((1-h_G^P)h_O^P+\tfrac{1}{2}h_G^P h_O^P)$$

$$+\varphi_+^P(1-h_P^P)((1-h_G^P-\Delta h)h_O^P+\tfrac{1}{2}(h_G^P+\Delta h)h_O^P)$$

$$+\varphi_-^P(1-h_P^P-\Delta h)((1-h_G^P+\lambda\Delta h)h_O^P+\tfrac{1}{2}(h_G^P-\lambda\Delta h)h_O^P)$$

$$+\varphi_N^{NV}((1-h_G^{NV})h_O^{NV}(1-h_P^{NV})$$

$$+\tfrac{1}{2}h_G^{NV}h_O^{NV}(1-h_P^{NV})+\tfrac{1}{2}(1-h_G^{NV})h_O^{NV}h_P^{NV}+\tfrac{1}{3}h_G^{NV}h_O^{NV}h_P^{NV})$$

$$+\varphi_+^{NV}((1-h_G^{NV}-\Delta h)h_O^{NV}(1-h_P^{NV})+\tfrac{1}{2}(h_G^{NV}+\Delta h)h_O^{NV}(1-h_P^{NV})$$

$$+\tfrac{1}{2}(1-h_G^{NV}-\Delta h)h_O^{NV}h_P^{NV}+\tfrac{1}{3}h_G^{NV}h_O^{NV}h_P^{NV})$$

$$+\varphi_-^{NV}((1-h_G^{NV}+\lambda\Delta h)h_O^{NV}(1-h_P^{NV}-\Delta h)$$

$$+\tfrac{1}{2}(h_G^{NV}-\lambda\Delta h)h_O^{NV}(1-h_P^{NV}-\Delta h)+\tfrac{1}{2}(1-h_G^{NV}+\lambda\Delta h)h_O^{NV}(h_P^{NV}+\Delta h)$$

$$+\tfrac{1}{3}(h_G^{NV}-\lambda\Delta h)h_O^{NV}(h_P^{NV}+\Delta h))$$

$$V_P^{NPC} = (\varphi_N^G+\varphi_+^G+\varphi_-^G)(1-h_G^G)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^G h_P^G)$$

$$+(\varphi_N^O+\varphi_+^O+\varphi_-^O)(1-h_O^O)((1-h_G^O)h_P^O+\tfrac{1}{2}h_G^O h_P^O)$$

$$+(\varphi_N^P+\varphi_+^P+\varphi_-^P)h_P^P$$

$$+(\varphi_N^{NV}+\varphi_+^{NV}+\varphi_-^{NV})((1-h_G^{NV})(1-h_O^{NV})h_P^{NV}$$

$$+\tfrac{1}{2}h_G^{NV}(1-h_O^{NV})h_P^{NV}+\tfrac{1}{2}(1-h_G^{NV})h_O^{NV}h_P^{NV}+\tfrac{1}{3}h_G^{NV}h_O^{NV}h_P^{NV})$$

$$V_P^{PC} = \varphi_N^G(1-h_G^G)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^G h_P^G)$$

$$+\varphi_+^G(1-h_G^G-\Delta h)((1-h_O^G)h_P^G+\tfrac{1}{2}h_O^G h_P^G)$$

$$+\varphi_{+}^{G}(1-h_{G}^{G}+\lambda\Delta h)((1-h_{O}^{G})(h_{P}^{G}+\Delta h)+\tfrac{1}{2}h_{O}^{G}(h_{P}^{G}+\Delta h))$$

$$+\varphi_{N}^{O}(1-h_{O}^{O})((1-h_{G}^{O})h_{P}^{O}+\tfrac{1}{2}h_{G}^{O}h_{P}^{O})$$

$$+\varphi_{+}^{O}(1-h_{O}^{O})((1-h_{G}^{O}-\Delta h)h_{P}^{O}+\tfrac{1}{2}(h_{G}^{O}+\Delta h)h_{P}^{O})$$

$$+\varphi_{-}^{O}(1-h_{O}^{O})((1-h_{G}^{O}+\lambda\Delta h)(h_{P}^{O}+\Delta h)+\tfrac{1}{2}(h_{G}^{O}-\lambda\Delta h)(h_{P}^{O}+\Delta h))$$

$$+(\varphi_{N}^{P}+\varphi_{+}^{P})h_{P}^{P}+\varphi_{-}^{P}(h_{P}^{P}+\Delta h)$$

$$+\varphi_{N}^{NV}((1-h_{G}^{NV})(1-h_{O}^{NV})h_{P}^{NV}$$

$$+\tfrac{1}{2}h_{G}^{NV}(1-h_{O}^{NV})h_{P}^{NV}+\tfrac{1}{2}(1-h_{G}^{NV})h_{O}^{NV}h_{P}^{NV}+\tfrac{1}{3}h_{G}^{NV}h_{O}^{NV}h_{P}^{NV})$$

$$+\varphi_{+}^{NV}((1-h_{G}^{NV}-\Delta h)(1-h_{O}^{NV})h_{P}^{NV}+\tfrac{1}{2}(h_{G}^{NV}+\Delta h)(1-h_{O}^{NV})h_{P}^{NV}$$

$$+\tfrac{1}{2}(1-h_{G}^{NV}-\Delta h)h_{O}^{NV}h_{P}^{NV}+\tfrac{1}{3}(h_{G}^{NV}+\Delta h)h_{O}^{NV}h_{P}^{NV})$$

$$+\varphi_{-}^{NV}((1-h_{G}^{NV}+\lambda\Delta h)(1-h_{O}^{NV})(h_{P}^{NV}+\Delta h)$$

$$+\tfrac{1}{2}(h_{G}^{NV}-\lambda\Delta h)(1-h_{O}^{NV})(h_{P}^{NV}+\Delta h)+\tfrac{1}{2}(1-h_{G}^{NV}+\lambda\Delta h)h_{O}^{NV}(h_{P}^{NV}+\Delta h)$$

$$+\tfrac{1}{3}(h_{G}^{NV}-\lambda\Delta h)h_{O}^{NV}(h_{P}^{NV}+\Delta h))$$

$$V_{NV}^{NPC}=(\varphi_{N}^{G}+\varphi_{+}^{G}+\varphi_{-}^{G})(1-h_{G}^{G})(1-h_{O}^{G})(1-h_{P}^{G})$$

$$+(\varphi_{N}^{O}+\varphi_{+}^{O}+\varphi_{-}^{O})(1-h_{G}^{O})(1-h_{O}^{O})(1-h_{P}^{O})$$

$$+(\varphi_{N}^{P}+\varphi_{+}^{P}+\varphi_{-}^{P})(1-h_{G}^{P})(1-h_{O}^{P})(1-h_{P}^{P})$$

$$+(\varphi_{N}^{NV}+\varphi_{+}^{NV}+\varphi_{-}^{NV})(1-h_{G}^{NV})(1-h_{O}^{NV})(1-h_{P}^{NV})$$

$$V_{NV}^{PC}=\varphi_{N}^{G}(1-h_{G}^{G})(1-h_{O}^{G})(1-h_{P}^{G})+\varphi_{+}^{G}(1-h_{G}^{G}-\Delta h)(1-h_{O}^{G})(1-h_{P}^{G})$$

$$+\varphi_{-}^{G}(1-h_{G}^{G}+\lambda\Delta h)(1-h_{O}^{G})(1-h_{P}^{G}-\Delta h)$$

$$+\varphi_{N}^{O}(1-h_{G}^{O})(1-h_{O}^{O})(1-h_{P}^{O})+\varphi_{+}^{O}(1-h_{G}^{O}-\Delta h)(1-h_{O}^{O})(1-h_{P}^{O})$$

$$+\varphi_{-}^{O}(1-h_{G}^{O}+\lambda\Delta h)(1-h_{O}^{O})(1-h_{P}^{O}-\Delta h)$$

$$+\varphi_{N}^{P}(1-h_{G}^{P})(1-h_{O}^{P})(1-h_{P}^{P})+\varphi_{+}^{P}(1-h_{G}^{P}-\Delta h)(1-h_{O}^{P})(1-h_{P}^{P})$$

$$+\varphi_{-}^{P}(1-h_{G}^{P}+\lambda\Delta h)(1-h_{O}^{P})(1-h_{P}^{P}-\Delta h)$$

$$+\varphi_{N}^{NV}(1-h_{G}^{NV})(1-h_{O}^{NV})(1-h_{P}^{NV})+\varphi_{+}^{NV}(1-h_{G}^{NV}-\Delta h)(1-h_{O}^{NV})(1-h_{P}^{NV})$$

$$+\varphi_{-}^{NV}(1-h_{G}^{NV}+\lambda\Delta h)(1-h_{O}^{NV})(1-h_{P}^{NV}-\Delta h)$$

Marginal effects of the negativity bias

Proposition 1: Marginal effects of the negativity bias for the basic case without non-voters

$$\frac{\delta V_G^{PC}}{\delta \lambda} = -\Delta h(\varphi_-^G + \varphi_-^O \tfrac{1}{2}(1 - h_O^O) + \varphi_-^P \tfrac{1}{2}(1 - h_P^P - \Delta h)) < 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$$\frac{\delta V_O^{PC}}{\delta \lambda} = \Delta h(\varphi_-^G \tfrac{1}{2}(h_O^G + 1 - h_P^G - \Delta h) + \varphi_-^P \tfrac{1}{2}(1 - h_P^P - \Delta h)) > 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$$\frac{\delta V_P^{PC}}{\delta \lambda} = \Delta h(\varphi_-^G \tfrac{1}{2}(1 - h_O^G + h_P^G + \Delta h) + \varphi_-^O \tfrac{1}{2}(1 - h_O^O) > 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

Proposition 3: Marginal effects of the negativity bias for the extension allowing for non-voters

$$\frac{\delta V_G^{PC}}{\delta \lambda} = -\Delta h(\varphi_-^G + \varphi_-^O(1 - h_O^O)(1 - \tfrac{1}{2}h_P^O - \tfrac{1}{2}\Delta h) + \varphi_-^P(1 - \tfrac{1}{2}h_O^P)(1 - h_P^P - \Delta h)$$

$$+\varphi_-^{NV}((1 - \tfrac{2}{3}h_O^{NV})(1 - \tfrac{1}{2}h_P^{NV} - \tfrac{1}{2}\Delta h) + \tfrac{1}{6}h_O^{NV})) < 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$$\frac{\delta V_O^{PC}}{\delta \lambda} = \Delta h(\varphi_-^G h_O^G(1 - \tfrac{1}{2}h_P^G - \tfrac{1}{2}\Delta h) + \varphi_-^P \tfrac{1}{2}h_O^P(1 - h_P^P - \Delta h)$$

$$+\varphi_-^{NV} \tfrac{1}{2}h_O^{NV}(1 - \tfrac{2}{3}h_P^{NV} - \tfrac{2}{3}\Delta h)) > 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$$\frac{\delta V_P^{PC}}{\delta \lambda} = \Delta h(\varphi_-^G(1 - \tfrac{1}{2}h_O^G)(h_P^G + \Delta h) + \varphi_-^O \tfrac{1}{2}(1 - h_O^O)(h_P^O + \Delta h)$$

$$+\varphi_-^{NV} \tfrac{1}{2}(1 - \tfrac{2}{3}h_O^{NV})(h_P^{NV} + \Delta h)) > 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

$$\frac{\delta V_{NV}^{PC}}{\delta \lambda} = \Delta h(\varphi_{-}^{G}(1-h_O^G)(1-h_P^G-\Delta h) + \varphi_{-}^{O}(1-h_O^O)(1-h_P^O-\Delta h)$$

$$+\varphi_{-}^{P}(1-h_O^P)(1-h_P^P-\Delta h) + \varphi_{-}^{NV}(1-h_O^{NV})(1-h_P^{NV}-\Delta h)) > 0,$$

as all voter shares, the degree of polarization and the probabilities for high payoffs exceed 0.

Differences in expected voter shares

Let $\hat{\theta}^i_{\varphi^j}$ be the threshold for ratio θ_{φ^j} and party bloc i at which the difference in expected voter shares is equal to 0.

Proposition 2: Differences in expected voter shares for the basic case without non-voters

$\Delta V_G = V_G^{PC} - V_G^{NPC}$

$= \Delta h(\varphi_+^G - \lambda\varphi_-^G$

$+\varphi_+^O \frac{1}{2}(1 - h_O^O) - \varphi_-^O \frac{1}{2}(1 - h_O^O)(\lambda + 1)$

$+\varphi_+^P \frac{1}{2}(1 - h_P^P) - \varphi_-^P(\frac{1}{2}(h_G^P - \lambda\Delta h + 1 - h_O^P) + \frac{1}{2}\lambda(1 - h_P^P)))$

Separating voter types leads to thresholds $\hat{\theta}^G_{\varphi^G} = \lambda$, $\hat{\theta}^G_{\varphi^O} = \lambda + 1$ and $\hat{\theta}^G_{\varphi^P} = \lambda + \frac{(h_G^P - \lambda\Delta h) + 1 - h_O^P}{1 - h_P^P}$.

$\Delta V_O = V_O^{PC} - V_O^{NPC}$

$= \Delta h(-\varphi_+^G \frac{1}{2}(h_O^G + 1 - h_P^G) + \varphi_-^G(-\frac{1}{2}(1 - h_G^G + \lambda\Delta h) + \frac{1}{2}\lambda(h_O^G + 1 - h_P^G))$

$-\varphi_+^P \frac{1}{2}(1 - h_P^P) + \varphi_-^P(-\frac{1}{2}(1 - h_G^P + \lambda\Delta h + h_O^P) + \frac{1}{2}\lambda(1 - h_P^P)))$

Separating voter types leads to thresholds $\hat{\theta}^O_{\varphi^G} = \lambda - \frac{1 - h_G^G + \lambda\Delta h}{1 - h_P^G + h_O^G}$ and $\hat{\theta}^O_{\varphi^P} = \lambda - \frac{(1 - h_G^P + \lambda\Delta h) + h_O^P}{1 - h_P^P}$.

$\Delta V_P = V_P^{PC} - V_P^{NPC}$

$= \Delta h(-\varphi_+^G \frac{1}{2}(h_P^G + 1 - h_O^G) + \varphi_-^G(\frac{1}{2}(1 - h_G^G + \lambda\Delta h) + \frac{1}{2}\lambda(h_P^G + 1 - h_O^G))$

$-\varphi_+^O \frac{1}{2}(1 - h_O^O) + \varphi_-^O \frac{1}{2}(1 - h_O^O)(\lambda + 1)$

$+\varphi_-^P)$

Separating voter types leads to thresholds $\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1 - h_G^G + \lambda\Delta h}{1 - h_O^G + h_P^G}$ and $\hat{\theta}^P_{\varphi^O} = \lambda + 1$.

Corollary 1: Intervals of thresholds

Note that $\lambda\Delta h \leq h_G^* \leq 1-\Delta h$ and $0 \leq h_P^* \leq 1-\Delta h$ to ensure that both chances to satisfy voters cannot be lower than 0 nor higher than 1 under polarization.

$\hat{\theta}^G_{\varphi^P} = \lambda + \frac{(h_G^P - \lambda\Delta h)+1-h_O^P}{1-h_P^P}$:$\hat{\theta}^G_{\varphi^P}$ is minimized for $h_G^P = \lambda\Delta h$, $h_O^P = 1$ and $h_P^P = 0$, which minimizes $\frac{(h_G^P - \lambda\Delta h)+1-h_O^P}{1-h_P^P}$. $\hat{\theta}^G_{\varphi^P}$ is maximized for $h_G^P = 1-\Delta h$, $h_O^P = 0$ and $h_P^P = 1-\Delta h$, maximizing $\frac{(h_G^P - \lambda\Delta h)+1-h_O^P}{1-h_P^P}$. Using these values, the interval for $\hat{\theta}^G_{\varphi^P}$ is $(\lambda, \frac{2}{\Delta h} - 1)$.

$\hat{\theta}^O_{\varphi^G} = \lambda - \frac{1-h_G^G+\lambda\Delta h}{1-h_P^G+h_O^G}$: $\hat{\theta}^O_{\varphi^G}$ is minimized for $h_G^G = \lambda\Delta h$, $h_O^G = 0$ and $h_P^G = 1-\Delta h$, which maximizes $\frac{1-h_G^G+\lambda\Delta h}{1-h_P^G+h_O^G}$. $\hat{\theta}^O_{\varphi^G}$ is maximized for $h_G^G = 1-\Delta h$, $h_O^G = 1$ and $h_P^G = 0$, minimizing $\frac{1-h_G^G+\lambda\Delta h}{1-h_P^G+h_O^G}$. Using these values, the interval for $\hat{\theta}^O_{\varphi^G}$ is $(\lambda - \frac{1}{\Delta h}, \lambda(1-\frac{\Delta h}{2}) - \frac{\Delta h}{2})$.

$\hat{\theta}^O_{\varphi^P} = \lambda - \frac{(1-h_G^P+\lambda\Delta h)+h_O^P}{1-h_P^P}$: $\hat{\theta}^O_{\varphi^P}$ is minimized for $h_G^P = \lambda\Delta h$, $h_O^P = 1$ and $h_P^P = 1-\Delta h$, which maximizes $\lambda - \frac{(1-h_G^P+\lambda\Delta h)+h_O^P}{1-h_P^P}$. $\hat{\theta}^P_{\varphi^G}$ is maximized for $h_G^G = 1-\Delta h$, $h_O^G = 0$ and $h_P^G = 0$, minimizing $\frac{1-h_G^G+\lambda\Delta h}{1-h_P^G+h_O^G}$. Using these values, the interval for $\hat{\theta}^O_{\varphi^P}$ is $(\lambda - \frac{2}{\Delta h}, \lambda(1-\Delta h) - \Delta h)$.

$\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1-h_G^G+\lambda\Delta h}{1-h_O^G+h_P^G}$: $\hat{\theta}^P_{\varphi^G}$ is minimized for $h_G^G = 1-\Delta h$, $h_O^G = 0$ and $h_P^G = 1-\Delta h$, which minimizes $\frac{1-h_G^G+\lambda\Delta h}{1-h_O^G+h_P^G}$. $\hat{\theta}^P_{\varphi^G}$ is maximized for $h_G^G = \lambda\Delta h$, $h_O^G = 1$ and $h_P^G = 0$, maximizing $\frac{1-h_G^G+\lambda\Delta h}{1-h_O^G+h_P^G}$. Using these values, the interval for $\hat{\theta}^P_{\varphi^G}$ is $(\lambda(1+\frac{\Delta h}{2-\Delta h}) + \frac{\Delta h}{2-\Delta h}, \infty)$.

Proposition 4: Differences in expected voter shares for the extension allowing for non-voters

$$\Delta V_G = V_G^{PC} - V_G^{NPC}$$

$$= \Delta h(\varphi_+^G - \lambda\varphi_-^G$$

$$+\varphi_+^O(1-h_O^O)(1-\tfrac{1}{2}h_P^O) - \varphi_-^O\tfrac{1}{2}(1-h_O^O)(h_G^O-\lambda\Delta h)\lambda(1-h_O^O)(1-\tfrac{1}{2}h_P^O)$$

$$+\varphi_+^P(1-\tfrac{1}{2}h_O^P)(1-h_P^P) - \varphi_-^P((1-\tfrac{1}{2}h_O^P)(h_G^P-\lambda\Delta h) + \lambda(1-\tfrac{1}{2}h_O^P)(1-h_P^P))$$

$$+\varphi_+^{NV}((1-\tfrac{2}{3}h_O^{NV})(1-\tfrac{1}{2}h_P^{NV}) + \tfrac{1}{6})$$

$$-\varphi_+^{NV}(\tfrac{1}{2}(1-\tfrac{2}{3}h_O^{NV})(h_G^{NV}-\lambda\Delta h) + \lambda((\tfrac{1}{2}(1-\tfrac{2}{3}h_O^{NV})(1-\tfrac{1}{2}h_P^{NV}) + \tfrac{1}{6}h_O^{NV}))))$$

Separating voter types leads to thresholds $\hat{\theta}^G_{\varphi^G} = \lambda$, $\hat{\theta}^G_{\varphi^O} = \lambda + \frac{h_G^O - \lambda\Delta h}{2-h_P^O}$, $\hat{\theta}^G_{\varphi^P} = \lambda + \frac{(h_G^P - \lambda\Delta h)}{1-h_P^P}$ and $\hat{\theta}^G_{\varphi^{NV}} = \lambda + \frac{(1-\frac{2}{3}h_O^{NV})}{(1-\frac{2}{3}h_O^{NV})(1-\frac{1}{2}h_P^{NV})+\frac{1}{3}h_O^{NV}}$.

$$\Delta V_O = V_O^{PC} - V_O^{NPC}$$

$$= \Delta h(-\varphi_+^G h_O^G(1-\tfrac{1}{2}h_P^G) + \varphi_-^G h_O^G(-\tfrac{1}{2}(1-h_G^G+\lambda\Delta h) + \lambda(1-\tfrac{1}{2}h_P^G))$$

$$-\varphi_+^P\tfrac{1}{2}h_O^P(1-h_P^P) + \varphi_-^P\tfrac{1}{2}h_O^P(-(2-h_G^P+\lambda\Delta h) + \lambda(1-h_P^P))$$

$$-\varphi_+^{NV}\tfrac{1}{2}h_O^{NV}(1-\tfrac{2}{3}h_P^{NV}) + \varphi_+^{NV}\tfrac{1}{2}h_O^{NV}(-(1-\tfrac{2}{3}h_G^P+\tfrac{2}{3}\lambda\Delta h) + \lambda(1-\tfrac{2}{3}h_P^{NV})))$$

Separating voter types leads to thresholds $\hat{\theta}^O_{\varphi^G} = \lambda - \frac{1-h_G^G+\lambda\Delta h}{2-h_P^G}$, $\hat{\theta}^O_{\varphi^P} = \lambda - \frac{2-h_G^P+\lambda\Delta h}{1-h_P^P}$ and $\hat{\theta}^O_{\varphi^{NV}} = \lambda - \frac{1-\frac{2}{3}h_G^{NV}+\frac{2}{3}\lambda\Delta h}{1-\frac{2}{3}h_P^{NV}}$.

$$\Delta V_P = V_P^{PC} - V_P^{NPC}$$

$$= \Delta h(-\varphi_+^G(1-\tfrac{1}{2}h_O^G) + \varphi_-^G(1-\tfrac{1}{2}h_O^G)((1-h_G^G+\lambda\Delta h)+\lambda h_P^G)$$

$$-\varphi_+^O\tfrac{1}{2}(1-h_O^O)h_P^O + \varphi_-^O\tfrac{1}{2}(1-h_O^O)((2-h_G^O+\lambda\Delta h)+\lambda h_P^O))$$

$$+\varphi_-^P$$

$$-\varphi_+^{NV}\tfrac{1}{2}(1-\tfrac{2}{3}h_O^{NV})h_P^{NV}$$

$$+\varphi_-^{NV}(\tfrac{1}{2}(1-\tfrac{2}{3}h_O^{NV})((2-h_G^{NV}+\lambda\Delta h)+\lambda h_P^{NV})+\tfrac{1}{6}h_O^{NV}))))$$

Separating voter types leads to thresholds $\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1-h_G^G+\lambda\Delta h}{h_P^G}$, $\hat{\theta}^P_{\varphi^O} = \lambda + \frac{2-h_G^O+\lambda\Delta h}{h_P^O}$ and $\hat{\theta}^P_{\varphi^{NV}} = \lambda + \frac{2-h_G^{NV}+\lambda\Delta h}{h_P^{NV}} + \frac{h_O^{NV}}{h_P^{NV}(3-2h_O^{NV})}$.

$$\Delta V_{NV} = V_{NV}^{PC} - V_{NV}^{NPC}$$

$$= \Delta h(-\varphi_+^G(1-h_O^G)(1-h_P^G) + \varphi_-^G(1-h_O^G)((1-h_G^G+\lambda\Delta h)+\lambda(1-h_P^G))$$

$$-\varphi_+^O(1-h_O^O)(1-h_P^O) + \varphi_-^O(1-h_O^O)((1-h_G^O+\lambda\Delta h)+\lambda(1-h_P^O))$$

$$-\varphi_+^P(1-h_O^P)(1-h_P^P) + \varphi_-^P(1-h_O^P)((1-h_G^P+\lambda\Delta h)+\lambda(1-h_P^P))$$

$$-\varphi_+^{NV}(1-h_O^{NV})(1-h_P^{NV}) + \varphi_-^{NV}(1-h_O^{NV})((1-h_G^{NV}+\lambda\Delta h)+\lambda(1-h_P^{NV})))$$

Separating voter types leads to thresholds $\hat{\theta}^{NV}_{\varphi^G} = \lambda - \frac{1-h_G^G+\lambda\Delta h}{1-h_P^G}$, $\hat{\theta}^{NV}_{\varphi^O} = \lambda - \frac{1-h_G^O+\lambda\Delta h}{1-h_P^O}$, $\hat{\theta}^{NV}_{\varphi^P} = \lambda - \frac{1-h_G^P+\lambda\Delta h}{1-h_P^P}$ and $\hat{\theta}^{NV}_{\varphi^{NV}} = \lambda - \frac{1-h_G^{NV}+\lambda\Delta h}{1-h_P^{NV}}$.

Intervals of thresholds in Proposition 5:

$\hat{\theta}^G_{\varphi^O} : (\lambda, \lambda(1 - \frac{\Delta h}{1+\Delta h}) + \frac{1-\Delta h}{1+\Delta h})$,

$\hat{\theta}^G_{\varphi^P} : (\lambda, \frac{1}{\Delta h} - 1)$,

$\hat{\theta}^G_{\varphi^{NV}} : (\lambda, \lambda(1 - \frac{\Delta h}{1+\Delta h}) + \frac{1-\Delta h}{1+\Delta h})$,

$\hat{\theta}^O_{\varphi^G} : (\lambda(1 - \frac{\Delta h}{1+\Delta h}) - \frac{1}{1+\Delta h}, \lambda(1 - \Delta h) - \frac{1}{2}\Delta h)$,

$\hat{\theta}^O_{\varphi^P} : (\lambda - \frac{2}{\Delta h}, \lambda(1 - \Delta h) - 1 - \Delta h)$,

$\hat{\theta}^O_{\varphi^{NV}} : (\lambda(1 - \frac{\frac{2}{3}\Delta h}{\frac{1}{3}+\frac{1}{3}\Delta h}) - \frac{1}{\frac{1}{3}+\frac{1}{3}\Delta h}, \lambda(1 - \frac{4}{3}\Delta h) - \frac{1}{3} - \frac{2}{3}\Delta h)$,

$\hat{\theta}^P_{\varphi^G} : (\lambda(1 + \frac{\Delta h}{1-\Delta h}) + \frac{\Delta h}{1-\Delta h}, \infty)$

$\hat{\theta}^P_{\varphi^O} : (\lambda(1 + \frac{\Delta h}{1-\Delta h}) + \frac{1+\Delta h}{1-\Delta h}, \infty)$

$\hat{\theta}^P_{\varphi^{NV}} : (\lambda(1 + \frac{\Delta h}{1-\Delta h}) + \frac{1+\Delta h}{1-\Delta h}, \infty)$

$\hat{\theta}^{NV}_{\varphi^j} : (\lambda - \frac{1}{\Delta h}, \lambda(1 - \Delta h) - \Delta h)$.

$\hat{\theta}^G_{\varphi^O} = \lambda + \frac{h^O_G - \lambda\Delta h}{2 - h^O_P}$: $\hat{\theta}^G_{\varphi^O}$ is minimized for $h^O_G = \lambda\Delta h$ and $h^O_P = 0$, which sets the numerator equal to 0 and maximizes the denominator. $\hat{\theta}^G_{\varphi^O}$ is maximized for $h^O_G = 1 - \Delta h$ and $h^O_P = 1 - \Delta h$, maximizing the numerator and minimizing the denominator. Using these values, the interval for $\hat{\theta}^G_{\varphi^O}$ is $(\lambda, \lambda(1 - \frac{\Delta h}{1+\Delta h}) + \frac{1-\Delta h}{1+\Delta h})$.

$\hat{\theta}^G_{\varphi^P} = \lambda + \frac{(h^P_G - \lambda\Delta h)}{1 - h^P_P}$: $\hat{\theta}^G_{\varphi^P}$ is minimized for $h^P_G = \lambda\Delta h$ and $h^P_P = 0$, which sets the numerator equal to 0 and maximizes the denominator. $\hat{\theta}^G_{\varphi^P}$ is maximized for $h^P_G = 1 - \Delta h$ and $h^P_P = 1 - \Delta h$, maximizing the numerator and minimizing the denominator. Using these values, the interval for $\hat{\theta}^G_{\varphi^P}$ is $(\lambda, \frac{1}{\Delta h} - 1)$.

$\hat{\theta}^G_{\varphi^{NV}} = \lambda + \frac{(1 - \frac{2}{3}h^{NV}_O)}{(1 - \frac{2}{3}h^{NV}_O)(1 - \frac{1}{2}h^{NV}_P) + \frac{1}{3}h^{NV}_O}$: $\hat{\theta}^G_{\varphi^{NV}}$ is minimized for $h^{NV}_G = \lambda\Delta h$, $h^{NV}_O = 0$ and $h^{NV}_P = 0$, which sets the numerator equal to 0. $\hat{\theta}^G_{\varphi^{NV}}$ is maximized for $h^{NV}_G = 1 - \Delta h$, $h^{NV}_O = 0$ and $h^{NV}_P = 1 - \Delta h$. Using these values, the interval for $\hat{\theta}^G_{\varphi^{NV}}$ is $(\lambda, \lambda(1 - \frac{\Delta h}{1+\Delta h}) + \frac{1-\Delta h}{1+\Delta h})$.

$\hat{\theta}^O_{\varphi^G} = \lambda - \frac{1-h^G_G+\lambda\Delta h}{2-h^G_P}$: $\hat{\theta}^O_{\varphi^G}$ is minimized for $h^G_G = \lambda\Delta h$ and $h^G_P = 1-\Delta h$, maximizing the numerator and minimizing the denominator. $\hat{\theta}^O_{\varphi^G}$ is maximized for $h^G_G = 1-\Delta h$ and $h^G_P = 0$, minimizing the numerator and maximizing the denominator. Using these values, the interval for $\hat{\theta}^O_{\varphi^G}$ is $(\lambda(1-\frac{\Delta h}{1+\Delta h}) - \frac{1}{1+\Delta h}, \lambda(1-\Delta h) - \frac{1}{2}\Delta h)$.

$\hat{\theta}^O_{\varphi^P} = \lambda - \frac{2-h^P_G+\lambda\Delta h}{1-h^P_P}$: $\hat{\theta}^O_{\varphi^P}$ is minimized for $h^P_G = \lambda\Delta h$ and $h^P_P = 1-\Delta h$, maximizing the numerator and minimizing the denominator. $\hat{\theta}^O_{\varphi^P}$ is maximized for $h^P_G = 1-\Delta h$ and $h^P_P = 0$, minimizing the numerator and maximizing the denominator. Using these values, the interval for $\hat{\theta}^O_{\varphi^P}$ is $(\lambda - \frac{2}{\Delta h}, \lambda(1-\Delta h) - 1 - \Delta h)$.

$\hat{\theta}^O_{\varphi^{NV}} = \lambda - \frac{1-\frac{2}{3}h^{NV}_G+\frac{2}{3}\lambda\Delta h}{1-\frac{2}{3}h^{NV}_P}$: $\hat{\theta}^O_{\varphi^{NV}}$ is minimized for $h^{NV}_G = \lambda\Delta h$ and $h^{NV}_P = 1-\Delta h$, maximizing the numerator and minimizing the denominator. $\hat{\theta}^O_{\varphi^{NV}}$ is maximized for $h^P_G = 1-\Delta h$ and $h^P_P = 0$, minimizing the numerator and maximizing the denominator. Using these values, the interval for $\hat{\theta}^O_{\varphi^{NV}}$ is $(\lambda(1-\frac{\frac{2}{3}\Delta h}{\frac{1}{3}+\frac{1}{3}\Delta h}) - \frac{1}{\frac{1}{3}+\frac{1}{3}\Delta h}, \lambda(1-\frac{4}{3}\Delta h) - \frac{1}{3} - \frac{2}{3}\Delta h)$.

$\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1-h^G_G+\lambda\Delta h}{h^G_P}$: $\hat{\theta}^P_{\varphi^G}$ is minimized for $h^G_G = 1-\Delta h$ and $h^G_P = 1-\Delta h$, minimizing the numerator and maximizing the denominator. $\hat{\theta}^P_{\varphi^G}$ is maximized for $h^G_G = \lambda\Delta h$ and $h^G_P \to 0$, which maximizes the numerator and minimizes the denominator. Using these values, the interval for $\hat{\theta}^P_{\varphi^G}$ is $(\lambda(1+\frac{\Delta h}{1-\Delta h}) + \frac{\Delta h}{1-\Delta h}, \infty)$.

$\hat{\theta}^P_{\varphi^O} = \lambda + \frac{2-h^O_G+\lambda\Delta h}{h^O_P}$: $\hat{\theta}^P_{\varphi^O}$ is minimized for $h^O_G = 1-\Delta h$ and $h^O_P = 1-\Delta h$, minimizing the numerator and maximizing the denominator. $\hat{\theta}^P_{\varphi^O}$ is maximized for $h^O_G = \lambda\Delta h$ and $h^O_P \to 0$, which maximizes the numerator and minimizes the denominator. Using these values, the interval for $\hat{\theta}^P_{\varphi^O}$ is $(\lambda(1+\frac{\Delta h}{1-\Delta h}) + \frac{1+\Delta h}{1-\Delta h}, \infty)$.

$\hat{\theta}^P_{\varphi^{NV}} = \lambda + \frac{2-h^{NV}_G+\lambda\Delta h}{h^{NV}_P} + \frac{h^{NV}_O}{h^{NV}_P(3-2h^{NV}_O)}$: $\hat{\theta}^P_{\varphi^{NV}}$ is minimized for $h^{NV}_G = 1-\Delta h$, $h^{NV}_O = 0$ and $h^{NV}_P = 1-\Delta h$, minimizing the first numerator, maximizing both denominators and setting the last summand equal to 0. $\hat{\theta}^P_{\varphi^{NV}}$ is maximized for $h^{NV}_G = \lambda\Delta h$, $h^{NV}_O = 1$ and $h^{NV}_P \to 0$, which maximizes both numerators and minimizes both denominators. Using these values, the interval for $\hat{\theta}^P_{\varphi^{NV}}$ is $(\lambda(1+\frac{\Delta h}{1-\Delta h}) + \frac{1+\Delta h}{1-\Delta h}, \infty)$.

$\hat{\theta}^{NV}_{\varphi^G} = \lambda - \frac{1-h^G_G+\lambda\Delta h}{1-h^G_P}$, $\hat{\theta}^{NV}_{\varphi^O} = \lambda - \frac{1-h^O_G+\lambda\Delta h}{1-h^O_P}$, $\hat{\theta}^{NV}_{\varphi^P} = \lambda - \frac{1-h^P_G+\lambda\Delta h}{1-h^P_P}$ and $\hat{\theta}^{NV}_{\varphi^{NV}} = \lambda - \frac{1-h^{NV}_G+\lambda\Delta h}{1-h^{NV}_P}$: $\hat{\theta}^{NV}_{\varphi^j}$ are minimized for $h^j_G = \lambda\Delta h$ and $h^j_P = 1-\Delta h$, maximizing the numerators and minimizing the denominators. $\hat{\theta}^{NV}_{\varphi^j}$ are maximized for $h^j_G = 1-\Delta h$ and $h^j_P = 0$, minimizing the numerators and maximizing the denominators. Using these values, the intervals for $\hat{\theta}^{NV}_{\varphi^j}$ are $(\lambda - \frac{1}{\Delta h}, \lambda(1-\Delta h) - \Delta h)$.

Marginal effects of polarization for the basic case without non-voters

Thresholds $\hat{\theta}^i_{\varphi^j}$ for swing voters:

Voter type / Party bloc	T^G	T^O	T^P
Government bloc G Marginal effect of polarization is positive iff θ_{φ^j} exceeds $\hat{\theta}^G_{\varphi^j}$	No swing voters	$\hat{\theta}^G_{\varphi^O}$ $= \lambda + \frac{1-h^O_O}{1-h^O_O}$ $= \lambda + 1$	$\hat{\theta}^G_{\varphi^P}$ $= \lambda - \frac{\lambda\Delta h}{1-h^P_P}$ $+\frac{(1-h^P_G+\lambda\Delta h)+h^P_O}{1-h^P_P}$
Opposition bloc O Marginal effect of polarization is positive iff θ_{φ^j} undercuts $\hat{\theta}^O_{\varphi^j}$	$\hat{\theta}^O_{\varphi^G}$ $= \lambda - \frac{\lambda\Delta h}{1-h^G_P+h^G_O}$ $+\frac{1-h^G_G+\lambda\Delta h}{1-h^G_P+h^G_O}$	No swing voters	$\hat{\theta}^O_{\varphi^P}$ $= \lambda - \frac{\lambda\Delta h}{1-h^P_P}$ $-\frac{(1-h^P_G+\lambda\Delta h)}{1-h^P_P}$
Profiteer bloc P Marginal effect of polarization is positive iff θ_{φ^j} undercuts $\hat{\theta}^P_{\varphi^j}$	$\hat{\theta}^P_{\varphi^G}$ $= \lambda + \frac{\lambda\Delta h}{1-h^G_O+h^G_P}$ $+\frac{1-h^G_G+\lambda\Delta h}{1-h^G_O+h^G_P}$	$\hat{\theta}^P_{\varphi^O}$ $= \lambda + \frac{1-h^O_O}{1-h^O_O}$ $=\lambda + 1$	No swing voters

Table 7: Marginal effects of polarization for swing voters for the basic setting

For core voters of the government, the marginal effect of polarization is positive iff $\theta_{\varphi^G} > \lambda$, for core voters of the opposition, there is no marginal effect and for core voters of profiteers, the marginal effect is $\varphi^P_- > 0$.

Marginal effects of polarization for the extension allowing for non-voters

Thresholds $\hat{\theta}^i_{\varphi^j}$ for swing voters:

Voter type / Party bloc	T^G	T^O	T^P	T^{NV}
Government bloc G	No swing voters	$\hat{\theta}^G_{\varphi^O} = \lambda + \frac{\frac{1}{2}h^O_G - \lambda\Delta h}{1-\frac{1}{2}h^O_P}$	$\hat{\theta}^G_{\varphi^P} = \lambda + \frac{h^P_G - 2\lambda\Delta h}{1-h^P_P}$	$\hat{\theta}^G_{\varphi^{NV}} = \lambda + \frac{(1-\frac{2}{3}h^{NV}_O)(h^{NV}_G - \lambda\Delta h)}{(1-\frac{2}{3}h^{NV}_O)(1-\frac{1}{2}h^{NV}_P)+\frac{1}{6}h^{NV}_O}$
Opposition bloc O	$\hat{\theta}^O_{\varphi^G} = \lambda - \frac{\frac{1}{2}-\frac{1}{2}h^G_G+\lambda\Delta h}{1-\frac{1}{2}h^G_P}$	No swing voters	$\hat{\theta}^O_{\varphi^P} = \lambda - \frac{2-h^P_G+2\lambda\Delta h}{1-h^G_P}$	$\hat{\theta}^O_{\varphi^{NV}} = \lambda - \frac{1-\frac{2}{3}h^{NV}_G+\frac{4}{3}\lambda\Delta h}{1-\frac{2}{3}h^{NV}_P}$
Profiteer bloc P	$\hat{\theta}^P_{\varphi^G} = \lambda + \frac{1-h^G_G+2\lambda\Delta h}{h^G_P}$	$\hat{\theta}^P_{\varphi^O} = \lambda + \frac{2-h^O_G+2\lambda\Delta h}{h^O_P}$	No swing voters	$\hat{\theta}^P_{\varphi^{NV}} = \lambda + \frac{2-h^{NV}_G+2\lambda\Delta h}{h^{NV}_P} + \frac{\frac{1}{6}h^{NV}_O}{\frac{1}{2}h^{NV}_P(1-\frac{2}{3}h^{NV}_O)}$
Non-voter bloc NV	$\hat{\theta}^{NV}_{\varphi^G} = \lambda - \frac{1-h^G_G+2\lambda\Delta h}{1-h^G_P}$	$\hat{\theta}^{NV}_{\varphi^O} = \lambda - \frac{1-h^O_G+2\lambda\Delta h}{1-h^O_P}$	$\hat{\theta}^{NV}_{\varphi^P} = \lambda - \frac{1-h^P_G+2\lambda\Delta h}{1-h^P_P}$	No swing voters

Table 8: Marginal effects of polarization for swing voters allowing for non-voting

The government enjoys a positive marginal effect of polarization from swing voter channels iff the corresponding ratio of positively and negatively polarized voters, θ_{φ^j}, exceeds thresholds $\hat{\theta}^i_{\varphi^j}$. All other blocs profit from positive marginal effects if and only if θ_{φ^j}, is lower than $\hat{\theta}^i_{\varphi^j}$. The government profits from marginal effects of polarization on its core voter share iff $\theta_{\varphi^G} > \lambda$. For core voters of the opposition, there is no effect. Profiteers enjoy an unambiguously positive marginal effect of polarization on core voter shares, which is $\varphi^P_- > 0$. The marginal effect on the share of non-voters who abstain again is positive if and only if $\theta_{\varphi^{NV}} = \lambda - \frac{1-h^{NV}_G+2\lambda\Delta h}{1-h^{NV}_P}$.

4 What happens if you ask your legislator about police violence? Experimental evidence on political elites' responsiveness before the US 2020 Elections

Abstract

We examine the effects of race (black vs. white) and political activism (for vs. against Black Lives Matter) on the legislators' responsiveness to email inquiries about the prevalence of police violence fatalities in their voting districts. We present three main findings. First, legislators do not racially discriminate against black voters in this experiment. Second, they are more responsive if the prevalence of fatalities supports the incumbent's partisan stance on BLM. Third, the more salient the topic "Blacks" in the district the more alert its incumbent is to the email.[1]

JEL: C93, D72, J15

Keywords: RCT, field experiment, racial discrimination, BLM, vote maximization, median voter

[1] AEA RCT Reg. Nr: AEARCTR-0006599. Registration Date: October 16, 2020 11:23 AM. DOI 10.1257/rct.6599-1.2; IRB approval ER_26/2020 University of Siegen; We declare that we have no relevant or material financial interests that relate to the research described in the paper.

4.1 Introduction

We analyze the effect of requesting information from a legislator as a fake voter who is either black or white and either a BLM supporter or opponent during the 2020 United States state legislature elections.

Our study is primarily motivated by two rivalling theories of discrimination. Costa (2017) finds that politicians racially discriminate against black voters with a robust interethnic bias in a meta study. This is evidence of taste-based discrimination, one of the two theories that explain discrimination (e.g. Bertrand and Duflo, 2017 and Guryan and Charles, 2013). Statistical discrimination theory opposes the theory that individuals hold less favorable attitudes towards ethnic minorities that cause unequal treatment of persons. Instead, discrimination results from a rational response to uncertainty (Becker, 1957).

Moreover, our study informs the theoretically predicted effects of non-single peaked voter preferences with field experimental evidence. This assumption is rapidly gaining relevance for political economics in the age of polarization (Jones et al., 2022 and Gennaioli and Tabellini, 2023). Here, Jones et al. (2022) show that strategically-minded candidates do not converge to the centre as the Downsian median voter theorem suggests if they are confronted with a polarized electorate. They conclude that candidates follow their electorate's polarized views and can even become more polarized than their electorate. If their model is supported by experimental evidence from the field, theoretical models of electoral competition building on the Downsian framework will be less able to explain politicians' behavior in the age of polarization. Similarly, Gennaioli and Tabellini (2023) show that polarization between voters and parties based on cultural conflicts can reinforce each other.

We test the predictions by Jones et al. (2022) in a field experiment with fake email requests from voters who are explicitly stating that they are in support of (or in opposition to) BLM and do (not) believe that blacks are killed disproportionately often in police encounters. In addition to the effect of polarized voter preferences, we are interested in examining the interplay with racially discriminatory behavior by political elites in a racially charged context and therefore vary the racial background of the sender.

We designed the digital experiment to test these two theoretical strands and fielded it right before the 2020 elections asking 4094 state legislators for data on police violence in their district. Randomizing 2*2 treatment dimensions, we varied first the inquirer's race and second the inquirer's stance on BLM. We block randomized treatments on the state level. This experimen-

tal design originates from the field of RCT audit studies (e.g. Butler and Broockman, 2011, Butler et al., 2012, Einstein and Glick, 2017) in political science with political elites.

We find that neither Democrat nor Republican legislators discriminate against the black inquirer. Instead, factors hinting at vote maximization explain differences in responsiveness. Democrats answer significantly more often to BLM supporters compared to BLM opponents. This is evidence of the relevance of partisanship effects in this specific polarized issue. Additionally, we identify vote maximizing behavior implied by strategic information transmission based on the number of police violence fatalities in the respective district. The odds to receive an answer increase significantly if the ratio of black and white police violence fatalities supports the incumbent's partisan stance on BLM. Measuring the salience of the topic "Blacks" using Google Trends Data, we find that the responsiveness increases significantly in the salience of the topic "Blacks". Higher salience is associated with a higher probability that legislators transmit the requested information strategically. The findings that incumbents are more responsive if they are up for reelection or if they represent a district with a high voter turnout empirically underscore the external validity of our experiment.

The absence of racial discrimination in our experiment implies that taste-based discrimination does not affect the behavior of political elites. Nevertheless we find abundant evidence of vote maximizing behavior which emphasizes the relevance of statistical discrimination in this study. These findings provide an intriguing insight: The odds to receive a response by a politician in this polarized setting are not caused by the inquirer's own socio-demographic traits, but by the political signal the voter sends out by claiming support for (or opposition to) BLM. This is causal experimental evidence to conclude that legislators prioritize voters who hold polarized views. Thus, we cannot reject the assumption that politicians are polarized instead of converging to the median voter preference as suggested by Jones et al. (2022). Our findings also support the finding by Gennaioli and Tabellini (2023) that polarization on cultural issues can be reinforced by the interaction between voters and politicians.

The remainder of this paper is organized as follows: In section 2, we illustrate the experimental design. In section 3, we present the main hypotheses on racial discrimination, on partisanship effects, on vote maximizing behavior implied by strategic information transmission, and on the salience of the topic "Blacks". In section 4, we present the main results. We interpret these results in section 5. Section 6 concludes. Additional and supplementary graphs and results are presented in the Appendix.

4.2 Experimental Design and Data

Our experiment follows the approach of an audit correspondence study (Fix and Struyk, 1993 and Bertrand and Duflo, 2017). Audit study designs enable scientists to establish causal claims on discrimination against race (e.g. Gaddis, 2015 and Kang et al., 2016) or other personal characteristics of the sender of an email such as gender (e.g. Booth and Leigh, 2010 and Mishel, 2016). As in other studies, emails will purportedly come from the legislator's constituents. We varied the experimental treatment in terms of the race of the constituents and the constituent's stance on the political issue of BLM. We randomized the names Deshawn Jackson and Matthew Mueller to signal a Black/White racial background.[2] In addition, we randomized whether the constituent supports or opposes BLM and believes that Blacks are (not) disproportionately killed in the legislator's district. The context contains a clear indication whether the sender supports the Black Lives Matter movement and its view on racial discrimination by police or not. To sum up, we used 2*2 treatments in the experiment. In the following, we describe our data set and how we fielded our experiment.

Our data set consists of 4,094 state legislators with an associated contact email address from upper and lower chambers and whose seats were up for election on November 3, 2020. The data set also contains those legislators who retired after the then-running election period and whose seats were up for election. We collected the legislators from ballotpedia.org. During this process, we collected information on the state, the chamber, a potential candidacy for re-election, a photo and an email address and the gender of the legislator.

The treatments were block-randomized on the state level and assigned to each state legislator. The email contained the following text:

Dear [first name last name],
My name is [Deshawn Jackson / Matthew Mueller] and I am concerned about police violence in our district.
I [support / oppose] the Black Lives Matter movement and I believe that Blacks are [blank / not] killed disproportionately in police encounters compared to white citizens in any given encounter.
To investigate this issue with data from our district I would like to know how many police encounters with black and white citizens were recorded, respectively, in your district in 2019 and how many black and white citizens

[2] At the time we designed the experiment, the latest data from the US census on the likelihood that an arbitrary name signals an arbitrary race was from 2010. According to this data, the first name signals a black individual, whereas the second name conveys that the individual is white.

were killed in these encounters?
Thank you and kind regards,
[Deshawn Jackson / Matthew Mueller]

We intentionally ask a controversial question on a polarized issue that flags out as a "typical" message by a polarized activist. Note that most studies assume that service requests are much more likely to receive a response (Costa, 2017). This is often built into these experiments at the design stage (Butler et al., 2012). Contrary and as an innovation to these designs, we set the inhibition threshold high on purpose to explore voting maximizing incentives. Our goal is to create a dilemma for the legislator, in which the legislator must decide whether to provide the voter with information regardless of the voter's "(un)reasonable" opinion - even if an answer reduces the chances of re-election.

To increase external validity and reduce digital fallout in the experiment, we used Gmail accounts with combinations of the fictious inquirer's first and last names. Further, we programmed an email client to send out the text emails from different VPN clients with IP addresses from within the US. This enabled us to both pass spam filters and to pop up as non-commercial in the mailbox from a US mail server of the Google cooperation. We do not know if the legislators responded in person or delegated this job to their staff. This is, however, irrelevant according to Butler and Broockman (2011), since the legislator's staff is briefed by the legislator on whom one should respond to.

Our emails ask for data on the prevalence of police violence. In order to check for vote maximizing incentives to strategically share this information, we need a source that allows us to verify the data we request. We retrieved this data from the Mapping Police Violence Database, which has already been applied to explore racial discrimination by police in other contexts (e.g. DeAngelis, 2021, Pomerantz et al., 2021 and Comer and Ingram, 2023). The data contains essential information on police violence fatalities since 2013, including the victim's race and the location of the incident. We assign each fatal encounter to state legislative districts by using information from the webpage openstates.org. It allows for a calculation of how many police violence fatalities of each race occurred in each district from 2013 to the election day. The US Census provides detailed information on the number of citizens by ethnicity in each voting district of every state. This data as well as police violence fatalities allow us to examine whether Blacks are killed disproportionately compared to Whites in each district in terms of fatalities per total population.

In addition to police violence data, we collect data on state election results and voter turnout in 2020 and 2016, the prior elections also taking place on the day of a Presidential election, from Harvard Dataverse and the US Census, respectively.

This study also investigates how the salience of the issue considered in the email, i.e. police violence and BLM, affects legislators' responsiveness. Therefore, we enriched the data set with data from Google Trends. This tool yields how often an arbitrary term or topic is searched for, relative to other terms or topics in a specific area and time span. Thus, it shows which terms or topics are literally "trending" more than others, across areas and over time. The data set contains time series on the topic "Blacks" at the lowest local level.

4.3 Conceptual framework

4.3.1 The context: Police violence and the BLM movement

Black Lives Matter is a movement with a long history, dating back much further than to the murder of George Floyd in the summer of 2020. Police officer George Zimmerman's acquittal on murder charges of the Black teenager Trayvon Martin in July 2013 marks the beginning of the phrase Black Lives Matter on Facebook (Ilchi and Frank, 2021). The movement demands equality for Blacks and criticizes discrimination against Blacks in the US (Ilchi and Frank, 2021). Areas of discrimination that concern BLM are not limited to police violence, but also biases against Blacks in criminal justice (see, e.g., Arnold et al., 2018 and Arnold et al., 2022). There have been peaks in the movement's publicity in the aftermath of Black victims of police violence. A prominent and recent example is the murder of George Floyd.

There is also opposition to the BLM movement in the US. The QAnon movement opposes the claims of BLM and organizes counter-protests to BLM protests (Forberg, 2021). Furthermore, the BLM hypotheses are controversial. Psychologist Steven Pinker tweeted in 2015 that the "police don't shoot blacks disproportionately". He was referring to data by the economist Sendhil Mullainathan (2015) showing that Blacks are shot disproportionately per citizen, but not per encounter.[3] Although scientists had discussed his analysis intensively in 2015, Pinker renewed his claim in 2017, stating that "[p]olice kill too many people, black & white" and that the "[f]ocus

[3] https://statmodeling.stat.columbia.edu/2015/10/21/its-all-about-the-denominator-and-rajiv-sethi-and-sendhil-mullainathan-in-a-statistical-debate-on-racial-bias-in-police-killings/

on race distracts from solving the problem".[4] This further called attention to the question if Blacks are disproportionately killed in police encounters again. To increase external validity of our treatments our requests point at this very controversial claim.

Contrary views on police violence against Blacks and on the equality provided by American institutions, in general, caused polarization in American society (Tesler, 2016, Gallagher et al., 2018 and Bolsover, 2020) and across the political landscape (Panda et al., 2020 and Updegrove et al., 2020) of the US. Importantly for our study, there are also strong partisanship effects from the attitudes towards police violence on different races. While Democrats tend to support BLM and its underlying claims, Republicans tend to oppose it (Tesler, 2016, Drakulich et al., 2020, Updegrove et al., 2020 and Reny and Newman, 2021).

From the aforementioned evidence on polarization due to police violence and partisanship as well as previous literature on political elites' responsiveness towards inquirers of different races, we establish the following hypotheses:

Hypothesis 1 (Racial discrimination): *White inquirers, relative to black inquirers, receive a higher response rate, regardless of inquirer's the stance on BLM.*

Hypothesis 2 (Partisanship effects): *Partisanship affects response rates as follows:*

1. *Inquirers supporting BLM, relative to inquirers opposing BLM, receive a higher response rate by Democrats, regardless of the inquirer's race.*

2. *Inquirers opposing BLM, relative to inquirers supporting BLM, receive a higher response rate by Republicans, regardless of the inquirer's race.*

4.3.2 Incentives from police violence fatalities to maximize votes

We expect that the actual prevalence of police violence may incentivize the incumbent to be responsive to an inquirer. If the prevalence of police violence underscores the incumbent's bipartisan stance towards BLM, we expect an answer to the inquirer at a higher chance. Consequently, we expect that an incumbent is more likely to answer if providing the requested information increases the chances to be elected. This incentive thus accounts for vote maximizing behavior and reflects motives to reply which are solely based on the characteristics of the district and the legislator's party.

[4] https://www.nytimes.com/2015/10/18/upshot/police-killings-of-blacks-what-the-data-says.html

In order to establish our hypothesis, we make the following assumptions: First, both the inquirer's and the incumbent's opinion on BLM are binary, meaning that the topic is polarized. Second, we consider the communication between the voter and the legislator as a sender-receiver-game from information economics (Crawford and Sobel, 1982).

Consequently, strategic information transmission implies a vote maximizing incentive resulting from the prevalence of police violence fatalities leading to the following effects on the legislator's responsiveness:

Hypothesis 3 (Strategic information transmission): *Inquirers receive a response with a higher probability*

1. *in districts with a Democrat incumbent and in which Blacks are disproportionately killed and*
2. *in districts with a Republican incumbent and in which Blacks are not disproportionately killed.*

relative to inquirers in districts without any black or white fatalities.

We define a dummy variable $v \in \{0; 1\}$. It has the value of 1 in districts in which we expect a higher response rate as outlined in Hypothesis 3. The variable takes a value of 0 in districts without any black or white fatalities. With this definition, v depicts whether an legislator has an incentive to communicate the statistic on police violence fatalities or not.

4.3.3 Salience

We expect that salience of BLM may also explain incumbents' responsiveness. We use Google Trends data on the topic "Blacks". The frequency with which the topic "Blacks" is searched is a proxy for the salience of the issue of police violence and BLM. The topic "Blacks" can be searched for by voters from any party background. Contrary to e.g. "QAnon", we believe that the topic "Blacks" is neutral in terms of the direction of polarization.

Measuring topic salience with Google Trends is done frequently in the context of politics (Mellon, 2014, Chykina and Crabtree, 2018 and Bromley-Trujillo and Poe, 2020). Contrary to older literature suggesting that politicians create salience by themselves (Petrocik, 1996 and Petrocik et al., 2003), more recent studies find that the salience of an arbitrary topic within the electorate causes changes in the communication by politicians (Helbling and Tresch, 2011, Wagner and Meyer, 2014, Klüver and Sagarzazu, 2016, Stier et al., 2018 and Dennison and Geddes, 2019). As a result, we do expect that salience of the police violence and BLM issue is a relevant factor to explain responsiveness. Therefore, we establish the following hypothesis:

Hypothesis 4 (Salience of police violence and BLM): *The response rate in each state increases in the salience of the topic "Blacks", regardless of the legislator's party and the inquirer's characteristics.*

4.3.4 Econometric approach

In correspondence studies, fictitious individuals who are identical except for race or other characteristics request information. Group differences in outcomes, for example Blacks receiving fewer replies than Whites, are interpreted as reflecting discrimination. We observe if we do or do not receive a manually typed answer. This binary observation with the values of 0 or 1 are the two states of the dependent variable y. The right hand side of the equation consists of the independent variables that are likely to have an effect on the observed outcome y. The first vector includes attributes of the incumbent, i.e. being a Democrat or a Republican, black or white, age and if the incumbent is up for reelection or not. The other vectors stem from the hypotheses established in the prior subsections. The treatment vectors are two binary variables. We will empirically test the above-mentioned hypotheses using simple mean comparisons. In addition, we conduct a multivariate test procedure for all legislators. For the sake of simplicity, we report the mean differences between our treatment vectors and confidence intervals on a 90 % level in the results in the numerical order of our hypotheses.

4.4 Results

We observed a response rate of 31.4 % during the experiment. Summary statistics on the data set can be found in the Appendix (Table 1). Our stratification involved block-randomization of treatments at the state level. Tables 2 and 3 in the Appendix report the covariate balance across different treatment groups. Tables 4 to 10 show test statistics on the Hypotheses 1 to 4 in numerical order.

4.4.1 Racial treatment effects

Figure 1 illustrates the response rates of Democratic legislators on the left hand side and of Republican legislators on the right hand side. Each left bar depicts the responsiveness towards Matthew Mueller. Each right bar corresponds to the responsiveness to the black alias, Deshawn Jackson.

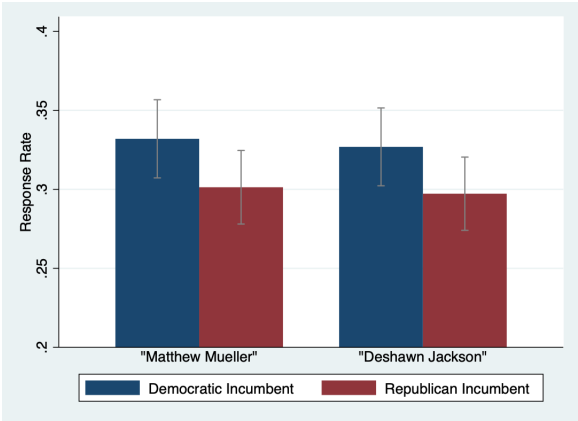


Figure 1: Responsiveness by party and sender's race

We find that legislators' responsiveness is not significantly different between the alleged black or white inquirer. While Republican incumbents' responsiveness is lower, the difference is not significant compared to Democrat incumbents. Due to insignificant average treatment effects of our race treatment, we reject Hypothesis 1.

4.4.2 BLM treatment effects

Figure 2 depicts the response rate of Democrats on the left hand side and of Republicans on the right hand side towards BLM supporters and opponents, respectively.

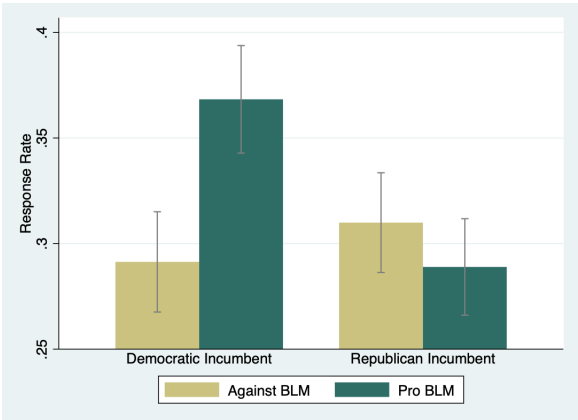


Figure 2: Responsiveness by party and sender's ideology

The Democrats' response rate towards BLM supporters is significantly higher compared to BLM opponents. While Republicans tend to reply more often to BLM opponents compared to BLM supporters, the difference is not significant. Therefore, we accept the first part of Hypothesis 2. However, we

can neither reject nor confirm the second part of Hypothesis 2, as an effect of the inquirer's position on police violence and BLM on Republicans' responsiveness exists but is not significant.

4.4.3 Response behavior and prevalence of police violence

We compare the average responsiveness of

1. Democrat incumbents who are running for re-election in districts where we observe that blacks are disproportionately killed and

2. Republican incumbents who are running for re-election in districts where we observe that blacks are not disproportionately killed

with incumbents who are running for re-election in districts without any black or white policing fatalities between 2013 and 2020. A map illustrating the statistics on police violence in lower chamber districts can be found in the Appendix (Figure 5). Additionally, we focus on districts with a voter turnout higher than the median turnout in the 2016 state legislative elections. Running for re-election and being located in a district with above-median voter turnout ensures that vote maximizing incentives do exist. First, incumbents not running for re-election have no incentive to maximize their chances to be voted for and thus no vote maximizing incentive to share information as stated in Hypothesis 3. Second, low voter turnouts hint at a politically inactive electorate. In this case, an incumbent would have a lower incentive to share information since the chances that the inquirer votes are smaller compared to a district in which voter turnout is high. We illustrate who is running for re-election and show 2016 voter turnout data across districts in maps in the Appendix (Figures 6 and 7).

In Figure 3, we show how Democrats' and Republicans' responsiveness differs between districts in which they have a vote maximizing incentive given by police fatalities statistics and districts without fatalities due to police violence, meaning that there is no incentive. The analysis incorporates all districts meeting the two criteria described above.

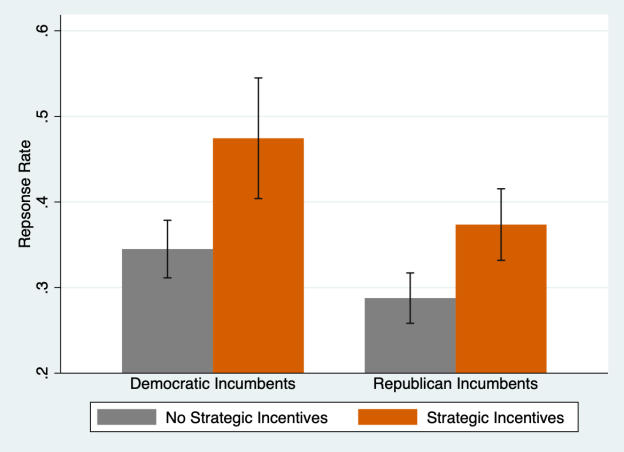


Figure 3: Responsiveness by party and vote maximizing incentive

Figure 3 shows that responsiveness is significantly higher in those districts where we observe police violence statistics that match the bipartisan stance towards BLM compared to districts police where we do not observe any black or white fatalities. For Republicans this corresponds to a statistic that contradicts BLM and vice versa for Democrats. From this analysis, we can confirm Hypothesis 3 stating that vote maximizing incentives play a significant role in the incumbents' behavior. The effect of the vote maximizing incentive is robust to several alternative specifications (see Appendix, Tables 2 and 3). To show this, we include districts below median voter turnout and further add incumbents who do not run for re-election. Table 3 in the Appendix shows the marginal effects on the odds of receiving a response. If police violence fatalities are in line with the bipartisan stance towards BLM, the chance to receive an answer to an inquiry is higher by 6.9 percentage points compared to districts without any black or white policing fatalities. We also add further socio-economic controls such as average income, unemployment rate and the ratio of black over white inhabitants. The effect of vote maximizing incentives based on police violence fatalities remains at the highest level of statistical significance. We also find evidence in line with previous studies: The chances to receive a response is 6.7 percentage points higher for female legislators compared to male legislators. In addition the chance to receive an answer to an inquiry is 15.6 percentage points higher for legislators running for re-election compared to legislators not running for re-election. Both effects are significant on a 99 % level. Average income, the unemployment rate and the ratio of black over white inhabitants in a district do not yield significant effects.

4.4.4 Salience of police violence and BLM

Figure 4 illustrates responsiveness in voting districts split into increasing terciles of salience of the topic “Blacks”. Salience is measured by Google Trends Data one week before the elections. The third tercile represents the highest salience.

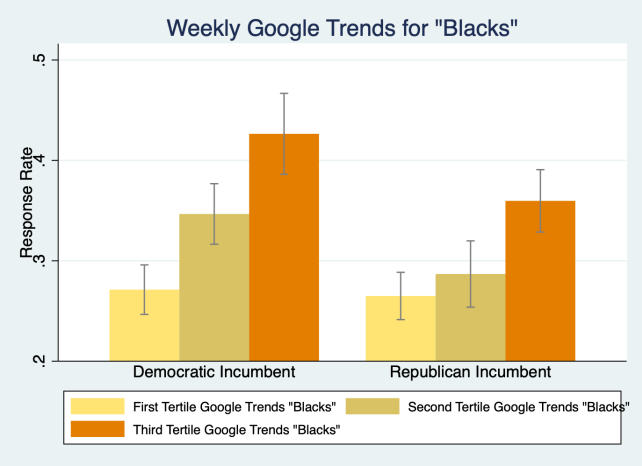


Figure 4: Responsiveness by Google Trends Data ”Blacks”

The Democrats’ responsiveness increases with each tercile significantly. For Republican legislators, this holds only for the highest tercile compared to the other two terciles. Based on this evidence, we cannot reject Hypothesis 4.

Finally, we explore the odds of vote maximizing incentives for incumbents (see Appendix, Figure 8). We find that the incumbents use discretion and transmit information strategically in line with the vote maximizing incentive Hypothesis 3 if the topic ”Blacks” is more salient. Intuitively, the more relevant a topic is in the electorate, the more a legislator may be incentivized to send favorable information on the topic to the inquirer. We estimated the predictive margins between legislators who have a vote maximizing incentive to reply and legislators without this incentive subject to the salience of the topic “Blacks”. We find that the probability that an incumbent employs strategic information transmission increases for incumbents of both parties with increasing salience of the topic ”Blacks”. Republicans follow these incentives significantly more often than Democrats in districts featuring a low level of salience. For very high level of salience, Democrats employ strategic information transmission significantly more often than Republicans.

4.5 Discussion of the results

First of all, we observed a response rate of 31.4 % during the experiment. Therefore, we conclude that our messages were taken at face value. Response rates differ significantly in studies with similar settings (Costa, 2017). While White et al. (2015) reach a rate of 73 %, the rate in the experiment by Butler et al. (2012) is only 19 %. The response rate in our experiment is below average compared to the meta study by Costa (2017). Given the importance of the issue of police violence fatalities, these results are staggering. Recall that the legislators' main task is to serve their constituents' interests, irrespective of what their political ideology is. Even a short note on the unavailability of data would have been sufficient. Butler et al. (2012) propose multiple theories for why elected officials should be less likely to respond to policy-oriented messages. One is that elected officials are unlikely to respond to their constituents if they disagree on issues. We cannot reject this hypothesis.

We do not find evidence to conclude racial discrimination against Blacks - at least for the context of requesting information on the prevalence of police violence. Other experiments found that the black alias received significantly fewer replies from both parties Costa (2017). Most of the preceding field experiments however targeted legislators with uncontroversial questions or service requests. In contrast, we intentionally treated incumbents with a racially charged and controversial issue which might explain why we do not find any racial bias against Blacks in our experiment. In addition, some studies assume that specific issues including criminal justice are broadly considered African American issue areas, which might explain why we do not observe a racial bias against the black alias in our experiment (Haney-López, 2014 and Stephens-Dougan, 2020). We also do not find that black inquirers receive a higher response rate (e.g. Einstein and Glick, 2017). Instead, we find that neither race is discriminated against.

Our findings show that differences in responsiveness can be explained by vote maximizing behavior, i.e., partisanship, strategic information transmission based on the prevalence of police violence in the incumbent's district and the salience of the topic "Blacks".

Our findings in section 4.2 suggest that the inquirer's stance towards the issue of police violence and BLM causes the legislators' response behavior conditional on partisanship as suggested in Hypothesis 2. Democrats are significantly more responsive to BLM supporters than Republicans. Moreover, Republicans are more responsive to BLM opponents. Our results therefore corroborate evidence on the partisanship effect in the context of BLM (Tesler, 2016, Drakulich et al., 2020, Updegrove et al., 2020 and Reny and

Newman, 2021). To sum up, our findings underscore partisanship effects in general (e.g. Bartels, 1998, Huddy et al., 2015 and Caughey et al., 2017).

We cannot reject Hypothesis 3 that the legislator's responsiveness is conditional on the prevalence of police violence. We find that incumbents respond significantly more often if the local statistic of police violence matches with their own position towards BLM. This is in line with the hypothesis based on strategic information transmission and suggests vote maximizing behavior by legislators. Republicans respond with a higher chance in those districts where Blacks are not disproportionately killed compared to Republicans in districts without black or white police violence fatalities. Democrats respond with a higher chance in those districts in which Blacks are disproportionately killed.

Differences in response behavior conditional on the prevalence of police violence can be explained by vote maximization in line with our theory in section 3.2. We find that a legislator who can provide information that may increase their chance of being re-elected is more likely to respond compared to a legislator who can send only neutral information. Intuitively, the probability to receive an answer depends on whether the content underlying the message is advantageous for the legislator or not. Our experiment therefore suggests that vote maximizing incentives related to the issue of the inquiry should always be considered if racial and partisanship effects are examined at the same time. Thus, to the best of our knowledge, we are the first to disentangle partisanship and strategic information transmission with our experimental design. The results also underscore the important role of strategic information transmission (Crawford and Sobel, 1982 and subsequent literature) for political economy.

The results provide evidence of the effect of bimodal voter preferences on politicians' behavior during electoral competition as predicted by Jones et al. (2022). They suggest that bimodal voter preferences lead to ideological polarization within two-party competition. Our results support their prediction by finding that the legislator's response behavior is caused by the polarized inquirer's stance towards BLM.

Our results also suggest that their modeling may be incomplete: If the statistic on police violence victims matches the incumbent's bipartisan point of view, we observe a significantly higher response rate. This is evidence to conclude that incumbents exercise substantial discretion and use it for the means of polarization if it maximizes the chance to be elected. This is why we believe that polarization can be self-enforcing between voters and politicians. Therefore, our results are also in support of Gennaioli and Tabellini (2023) who find that dealing with cultural problems can lead to increasing

polarization between voters and parties. This finding may also be of interest for the theoretical modeling of political competition in two-party systems. The Downsian expectation of convergence towards a median voter solution can be doubted in the presence of polarization. To the best of our knowledge, we are the first who find empirical evidence of the strategic interaction of political elites who are faced with polarized voters.

Our findings remain significant in a robustness check that controls for politician and district-specific effects. In line with the empirical literature, we confirm that female incumbents are significantly more responsive compared to their male counterparts (e.g. Druckman and Valdes, 2019, Thomsen and Sanders, 2020 and Dhima, 2022).

In Hypothesis 4 we tested if a higher salience of the core issue of this study causes a positive and significant effect on the response rate. Measuring salience with Google Trends data in the search topic "Blacks", which includes BLM and all related searches, we could not reject the hypotheses that a higher salience is associated with a higher response rate. We find that legislators are more responsive in the highest tercile of topic salience compared to the lowest tercile. This finding is in line with other recent studies showing that the salience of a topic increases the responsiveness of political elites (e.g. Hagemann et al., 2017, Barberá et al., 2019 and Hobolt and Wratil, 2020).

We confirm the theoretical assumption of strategic information transmission, i.e. that legislators are informed about the relevance of the issue BLM within their electorate with empirical evidence. Due to the lack of identification we do not know exactly how politicians monitor their electorate, or if they perhaps receive this information from their political campaign staff or their state party offices. We are confident that this strategically relevant information is dispersed on the level of local voting districts. Alas, we find evidence that salience of topics impacts politicians' communication towards their voters. Our findings support the empirical strand of literature that finds that politicians' communication strategies vary with the salience of topics in the incumbent's electorate (Helbling and Tresch, 2011, Wagner and Meyer, 2014, Stier et al., 2018 and Dennison and Geddes, 2019). In addition, our findings on salience draw attention to its effects on electoral competition as developed in contemporary political theory (e.g. Aragonès et al., 2015 and Buisseret and van Weelden, 2020).

The results of this field experiment hint at the presence of statistical discrimination (Becker, 1957) instead of taste-based discrimination (e.g. Bertrand and Duflo, 2017 and Guryan and Charles, 2013). Note that we fielded the experiment during the election campaign on a racially charged issue against

the backdrop of a polarized political landscape. Further empirical studies may investigate the effect of other issues.

4.6 Concluding remarks

We conducted an IRB approved field experiment with political elites in the United States prior to the 2020 elections. We sent out emails to state legislators varying the sender's racial background (black vs. white) in the first dimension. The second dimension varied the stance towards the BLM movement. Each mail asked the legislators for data on police violence fatalities in their district. We were interested in the legislators' response behavior. The RCT trial enabled us to explore the effect of stances on BLM on the incumbents' response behavior and to identify strategic information transmission incentives.

We do not find any evidence to conclude racial discrimination in the responses. Neither Democrats nor Republicans discriminate against senders of different races. However, we find abundant evidence to conclude that legislators aim to maximize votes and thus discriminate against voters with a diverging stance towards BLM even if the prevalence of police violence in their districts suggests otherwise.

We find that Democrats respond significantly more often to BLM supporters compared to opponents, such that we find a significant partisanship effect.

Controlling for the prevalence of police violence in each district, we find positive incentives to sharing this information if it increases the probability of being elected. The probability that legislators act in line with these incentives increases with the salience of the issue as measured by Google Trends data.

We find that legislators are more responsive in the highest tercile of topic salience compared to the lowest tercile. This finding is in line with other recent studies showing that the salience of a topic increases the responsiveness of political elites (e.g. Hagemann et al., 2017, Barberá et al., 2019 and Hobolt and Wratil, 2020).

To sum up our findings, we conclude that statistical discrimination and vote maximization rather than taste-based discrimination explain a large part of the varying responsiveness between incumbents. Moreover, as predicted by Jones et al. (2022), polarized voter preferences can lead to polarized political elites. We find that elites strategically transmit information on police violence if this information coincides with their party's stance towards BLM. We find this opportunistic feedback behavior across districts in the U.S. and

conclude that elites may reinforce the polarization of the electorate by using discretion.

This study contributes to the literature as follows: First, we conclude that discrimination is conditional on the issue of the inquiry in correspondence studies. Second, we explore the effect of polarized voters on the behavior of political elites and conclude that the Downsian framework has to be put under closer scrutiny if we observe polarized voter preferences. Third, our experiment therefore suggests that vote maximizing incentives related to the issue of the inquiry should always be considered if racial and partisanship effects are examined at the same time.

Acknowledgments

We are grateful to D. Butler, M. Costa, G. Di Liddo, C. Grose, E. van Holm, J. Matsusaka, R. Mickey, and participants of the 2021 conference of the Midwest Political Science Association, of the 2021 Elites & Experiments Virtual Conference at University of Southern California and of the 2022 Meeting of the European Public Choice Society.

Appendix

In the following, additional data and tests to substantiate the analyses from section 4 is presented.

The following table shows summary statistics on the data set.

Variable	Mean	Std. Dev.	N
Response rate	0.314	0.464	4094
Male candidate	0.677	0.468	4094
Voter Turnout 2016	0.55	0.126	3876
Vote maximizing incentive	0.359	0.48	3318
Incumbent running for re-election	0.785	0.411	4094
Google Trends Blacks 9 months	0.496	0.132	4094

Table 1: Summary statistics

The following two tables report covariate balance across different treatment groups.

Variable	Whites	Blacks	mean diff.	p-value
Male candidate	67.22	68.15	-0.93	0.74
	(1.04)	(1.03)		
Voter Turnout	54.71	55.20	-0.49	0.89
2016 in %	(0.29)	(0.28)		
Incumbent running	78.52	78.49	0.03	0.49
for re-election	(0.90)	(0.90)		
Vote maximizing	35.58	36.15	-0.58	0.63
incentive	(1.17)	(1.18)		
Google Trends	41.26	41.26	0.00	0.50
Blacks 1 week	(0.35)	(0.35)		
Google Trends	49.63	49.65	-0.01	0.51
Blacks 9 months	(0.29)	(0.29)		
Household income in $	33787.49	34138.27	-350.78	0.84
	(245.17)	(258.02)		
Unemployment rate in %	4.88	4.87	0.01	0.47
	(0.05)	(0.05)		
Ratio Inhabitants:	25.76	26.02	-0.26	0.53
Blacks/Whites in %	(2.42)	(2.32)		

Table 2: Covariate balance: Treatment race

Variable	Against BLM	Pro BLM	mean diff.	p-value
Male candidate	67.70	67.66	0.05	0.49
	(1.03)	(1.03)		
Voter Turnout	55.25	54.66	0.59	0.07
2016 in %	(0.29)	(0.28)		
Incumbent running	78.26	78.75	-0.49	0.65
for re-election	(0.90)	(0.90)		
Vote maximizing	35.93	36.80	0.13	0.47
incentive	(1.18)	(1.17)		
Google Trends	41.27	41.25	0.02	0.48
Blacks 1 week	(0.35)	(0.35)		
Google Trends	49.67	49.62	0.04	0.46
Blacks 9 months	(0.29)	(0.29)		
Household income in $	34038.37	33888.24	150.13	0.34
	(251.19)	(252.29)		
Unemployment rate in %	4.89	4.86	0.03	0.34
	(0.05)	(0.05)		
Ratio Inhabitants:	26.22	25.56	0.66	0.42
Blacks/Whites in %	(2.59)	(2.13)		

Table 3: Covariate balance: Treatment stance on BLM

The next five tables report t-test statistics on all hypotheses in numerical order.

	Democrats	Republicans
Black Treatment	32.68 %	30.13 %
	N = 982	N = 1052
White Treatment	33.20 %	29.72 %
	N = 982	N = 1053
Differential	0.51 %	0.41 %
$H_a : differential \neq 0$	$p = 0.81$	$p = 0.84$
$H_a : differential < 0$	$p = 0.59$	$p = 0.58$
$H_a : differential > 0$	$p = 0.41$	$p = 0.42$
Pearson's chi-squared	$p = 0.81$	$p = 0.84$

Table 4: Test statistics for Hypothesis 1

The first row states the average reply rates and numbers of observations for the request sent by the Black treatment and the second for the White treatment. The third row calculates the differentials for each Democrats and Republicans between the Black and the White signal. The following three lines report p-values of t-tests. The p-value reported in the last row is for a Pearson's chi-squared test. Tables 5 to 8 are constructed analogously.

	Democrats	**Republicans**
Against BLM Treatment	29.13 %	30.99 %
	N = 992	N = 1039
Pro BLM Treatment	36.83 %	28.89 %
	N = 972	N = 1066
Differential	-7.70 %	2.10 %
$H_a : differential \neq 0$	$p = 0.00$	$p = 0.29$
$H_a : differential < 0$	$p = 0.00$	$p = 0.85$
$H_a : differential > 0$	$p = 0.99$	$p = 0.15$
Pearson's chi-squared	$p = 0.00$	$p = 0.29$

Table 5: Test statistics for Hypothesis 2

	Democrats	**Republicans**
No vote maximizing incentive	34.50 %	28.77 %
	N = 542	N = 643
Vote maximizing incentive	47.45 %	37.36 %
	N = 137	N = 364
Differential	-12.94 %	-8.59 %
$H_a : differential \neq 0$	$p = 0.01$	$p = 0.01$
$H_a : differential < 0$	$p = 0.00$	$p = 0.00$
$H_a : differential > 0$	$p = 1.00$	$p = 1.00$
Pearson's chi-squared	$p = 0.01$	$p = 0.05$

Table 6: Test statistics for Hypothesis 3 only including districts with a turnout higher than median voter turnout in 2016

	Democrats	**Republicans**
No vote maximizing incentive	31.46 %	27.56 %
	N = 1065	N = 1063
Vote maximizing incentive	36.54 %	32.56 %
	N = 416	N = 774
Differential	-5.08 %	-4.99 %
$H_a : differential \neq 0$	$p = 0.06$	$p = 0.02$
$H_a : differential < 0$	$p = 0.03$	$p = 0.01$
$H_a : differential > 0$	$p = 0.97$	$p = 0.99$
Pearson's chi-squared	$p = 0.01$	$p = 0.02$

Table 7: Test statistics for Hypothesis 3 including all districts

	Democrats	**Republicans**
Lowest tercile GT Blacks	27.13 %	26.50 %
	N = 881	N = 951
Medium tercile GT Blacks	34.67 %	28.68 %
	N = 675	N = 509
Highest tercile GT Blacks	42.65 %	35.97 %
	N = 408	N = 645
Differential Medium - Lowest	7.54 %	2.18 %
$H_a : differential \neq 0$	$p = 0.00$	$p = 0.37$
$H_a : differential < 0$	$p = 1.00$	$p = 0.81$
$H_a : differential > 0$	$p = 0.00$	$p = 0.19$
Pearson's chi-squared	$p = 0.00$	$p = 0.37$
Differential Highest - Medium	7.98 %	7.29 %
$H_a : differential \neq 0$	$p = 0.01$	$p = 0.01$
$H_a : differential < 0$	$p = 1.00$	$p = 1.00$
$H_a : differential > 0$	$p = 0.00$	$p = 0.00$
Pearson's chi-squared	$p = 0.01$	$p = 0.01$
Differential Highest - Lowest	15.52 %	9.47 %
$H_a : differential \neq 0$	$p = 0.00$	$p = 0.00$
$H_a : differential < 0$	$p = 1.00$	$p = 1.00$
$H_a : differential > 0$	$p = 0.00$	$p = 0.00$
Pearson's chi-squared	$p = 0.00$	$p = 0.00$

Table 8: Test statistics for Hypothesis 4

The following map shows in which lower chamber districts Blacks are (not) disproportionately killed and in which districts there is neither a white nor a black fatality due to police violence. Importantly, only districts in which state legislative elections took place on November 3, 2020 are covered. Others are labelled with "No data", even though there might have been black or white fatalities due to police violence from 2013 to 2020.

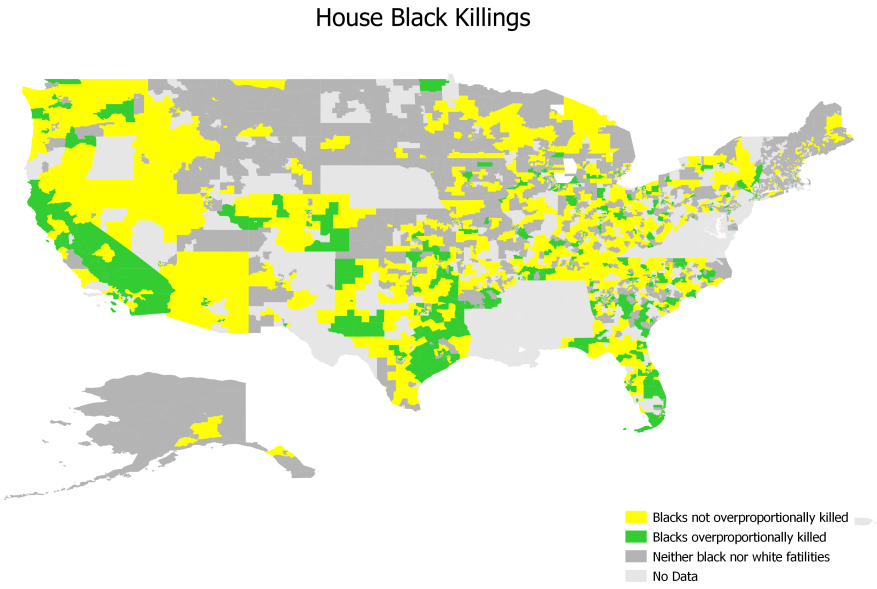


Figure 5: Statistics on police violence fatalities

The following map shows from which party incumbents in scope are and whether they run for reelection or not. Notice that not all states held state legislative elections on November 3, 2020. This is why they are dropped in the experiment.

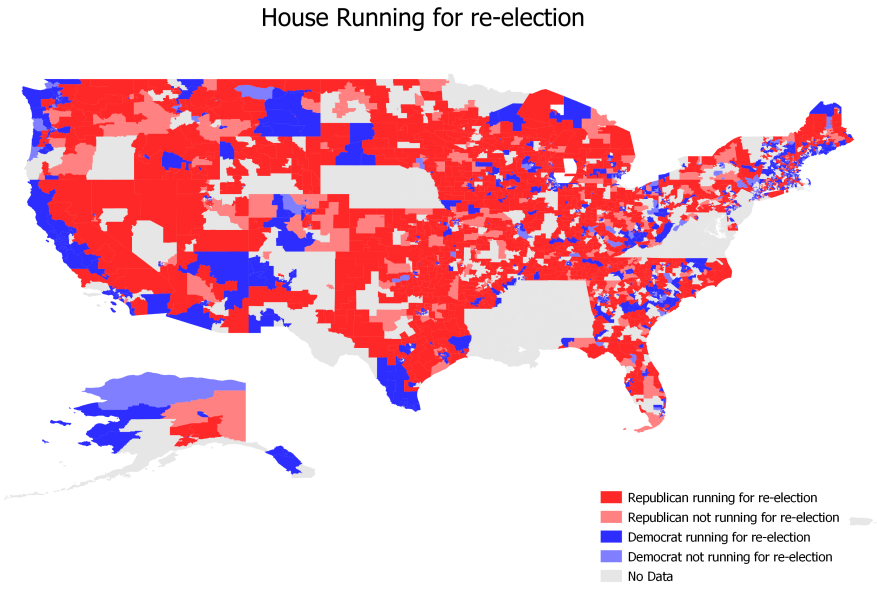


Figure 6: Legislators' parties and candidacy status

The following map illustrates the voter turnout in state legislative elections in 2016 for all lower chamber districts in scope.

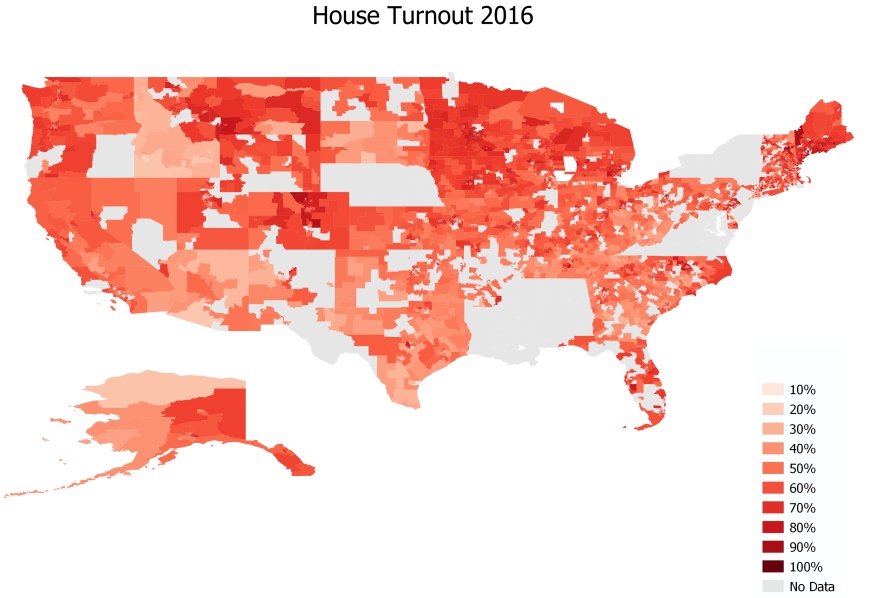


Figure 7: Voter turnout in 2016 state legislative elections

The following two tables provide robustness checks for the effect of the vote maximizing incentive from section 4.3.

	(1)	(2)
Variable	**Logit Model 1**	**Logit Model 2**
Dummy GOP legislator	-0.0950	-0.137
	(0.0799)	(0.0853)
Dummy male candidate	-0.327	-0.319
	(0.0831)	(0.0836)
Dummy running for re-election	0.737	0.749
	(0.104)	(0.104)
Dummy vote maximizing incentive	0.269	0.330
	(0.0796)	(0.0843)
Household income thousand $		$3.40 * 10^{-6}$
		$(3.66 * 10^{-6})$
Ratio Inhabitants: Blacks/Whites		-0.0444
		(0.0491)
Unemployment rate in %		-0.0273
		(0.0211)
Constant	-1.223***	-1.216***
	(0.118)	(0.238)
Observations	3,318	3,316

Robust standard errors in parentheses

Table 9: Robustness checks for vote maximizing incentives

Variable	(1) Marginal Effects Model 1	(2) Marginal Effects Model 2
Dummy GOP legislator	-0.0198	-0.0286
	(0.0167)	(0.0177)
Dummy male candidate	-0.0683	-0.0665
	(0.0172)	(0.0173)
Dummy running for re-election	0.154	0.156
	(0.0213)	(0.0212)
Dummy vote maximizing incentive	0.0562	0.0688
	(0.0165)	(0.0174)
Household income thousand $		$7.09 * 10^{-7}$
		$(7.63 * 10^{-7})$
Ratio Inhabitants: Blacks/Whites		-0.00926
		(0.0102)
Unemployment rate in %		-0.00568
		(0.00438)
Observations	3,318	3,316

Robust standard errors in parentheses

Table 10: Robustness checks for vote maximizing incentives

The following graph depicts the odds that a legislator employs strategic information transmission as implied by the vote maximizing incentive depending on the salience of the topic "Blacks".

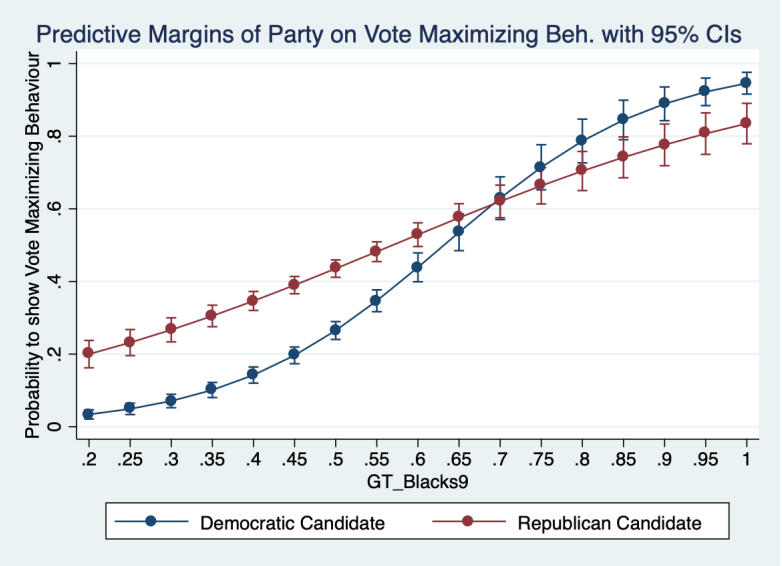


Figure 8: Legislators maximizing votes depending on salience

Figure 8 shows that Republican legislators are significantly more likely to exhibit strategic information transmission than their Democratic counterparts in districts with low levels of salience. Moreover, the higher the salience, the more incumbents of both parties behave in line with the vote maximizing incentive. Democrats use strategic information transmission significantly more often than Republicans in districts with very high salience of the topic "Blacks".

5 Does it make a difference what you ask your candidate? Discrimination against (minority) first-time voters

Abstract

This paper studies the effects of being a first-time voter with vs. without a migration background on the responsiveness of German federal election candidates' to inquiries concerning (i) dual citizenship and (ii) compulsory vaccination for teachers. We find that candidates of the right-wing AfD only discriminate against inquirers with migration backgrounds in the first context. Moreover, answers in favor of dual citizenship are significantly longer addressed to opponents of dual citizenship compared to supporters. Likewise, replies against compulsory vaccination are significantly longer addressed to supporters compared to opponents. We find both evidence of discrimination against minority voters and evidence of vote maximizing behavior.[1]

JEL: C93, D72, J15

Keywords: RCT, field experiment, racial discrimination, vote maximization, information economics

[1] AEA RCT Reg. Nr: AEARCTR-0008024 July 31 2021; IRB approval University of Siegen ER_30/2021 July 27 2021

5.1 Introduction

Minority voters are discriminated against by political elites (e.g. Butler and Broockman, 2011 and Butler et al., 2012). Costa (2017) shows in her meta-study comprising numerous correspondence studies that minority constituents were almost 10 percentage points less likely to receive a response than non-minority constituents. These differences in response rates are perceived as a racial bias and serve as an example for concluding taste-based discrimination (e.g. Bertrand and Duflo, 2017 and Guryan and Charles, 2013). Contrary to taste-based discrimination, statistical discrimination suggests that discrimination results from a rational behavioural response to uncertainty (Becker, 1957). In this experiment, we would like to test what type(s) of discrimination prevail(s) among German political elites who ran political campaigns.

We conducted a field experiment during the last weeks before the 2021 German federal election. We contacted candidates for the German Bundestag (N=1554) in every voting district by email. We block randomized email texts on the party level in a 2*2 dimensional treatment design: The first dimension varied first and last names to signal out a German background or a migration background from Turkey, which is a common procedure for studies of this type (e.g. Einstein and Glick, 2017, Baert, 2018). The second dimension varied support or opposition to specific political questions that were asked in the email to investigate whether the topic of the inquiry affects potential discrimination against minority voters. We ran two campaigns about different topics. In the first campaign, we asked the candidates about their attitudes towards dual citizenship. In the second campaign, we asked about the candidate's view on compulsory vaccination for teachers. Note that only the first topic is directly related to racial issues because German citizenship is determined by the "jus sanguinis" principle, i.e., by the ethnicity of one parent.

We find that discrimination against minority voters is conditional on the topic of the inquiry. If we ask about compulsory vaccination, candidates for the right-wing party 'Alternative für Deutschland' (AfD) neither discriminate against minority voters nor against non-minority voters in terms of the average reply rate. However, if we ask about double citizenship, candidates of the AfD discriminate against minority voters. Moreover, our findings provide evidence of the theory of vote maximizing behavior. We find that candidates in favor of dual citizenship write significantly more words to an opponent of dual citizenship compared to a supporter. Similarly, candidates who refuse compulsory vaccination for teachers write significantly longer replies to supporters of compulsory vaccination compared to opponents. This difference may be attributed to the legislators' attempts to

convince the inquirer or as an effort to obfuscate the unfavorable information for the inquirer. Consequently, we find taste-based discrimination only in a racially charged contexts, such as asking about dual citizenship. Statistical discrimination, uncovered by longer responses, is prevalent in both contexts.

5.2 Data and methods

We follow the approach of a correspondence study (Fix and Struyk, 1993 and Bertrand and Duflo, 2017). As stated above, we conducted two campaigns with different topics, dual citizenship and compulsory vaccination for teachers. In the first campaign, we applied 2*2*2 treatment dimensions. The first treatment was the inquirer's race. The first name was, according to German census data, either signalling migration background or not. The surname did not signal migration background for both dimensions. The second treatment was gender, signaling that the inquirer was female or male. Combined with the first treatment, the four names employed were: Lena Müller, Azra Müller, Yusuf Wolf and Linus Wolf. The last treatment depicted the inquirer's binary view on dual citizenship. Inquirers could be sceptical about dual citizenship or not. Due to insignificant gender treatment dimension in the first campaign, we applied 2*2 treatment dimensions in the second campaign. However, we increased the migration background signal by treating the addresses with inquiries from 'Ahmet Yilmaz' and 'Leon Wagner'. We randomized binary ideology treatments such that inquirers considered the compulsory vaccination a good or a bad idea.

As a novel idea, we conveyed in both campaigns that the inquirers were first-time voters from high school. This group is an important potential voting bloc for politicians and serves to explain why we restricted the compulsory vaccination to only teachers in the second case. Note that the debate on compulsory vaccination was especially serious with regard to teachers before the German federal elections.

Our data set consists of 1554 candidates from the six parties represented at that time in the German Bundestag and of the party "Freie Wähler" from Bavaria in which the party is part of the governing coalition. Only candidates whom we contacted successfully in both campaigns are included in this data set. We randomized the 2*2*2 treatment dimensions in the first campaign over all candidates on the party level as we are interested in differences between the candidates' responsiveness across parties. In the second campaign, the 2*2 treatment dimensions were again randomized on the party level.

We observe if we do or do not receive a manually typed answer. The binary observation has the value of 1 for a manually typed answer or 0 otherwise. For the sake of simplicity, we report t-tests on the mean differences between the two dimensions of the treatment migration background in the results. We depict 90 per cent confidence intervals in the corresponding figures. In this article, we constrain ourselves to the analysis of right-wing AfD candidates. We compare the responsiveness to inquirers with migration backgrounds against that to inquirers without migration backgrounds for each campaign on the party level. Additionally, we check whether the responsiveness per dimension of the treatment migration background on the party level differs between the campaigns. We also measure the length of replies. The address and closing as well quotes from the election program of each answer are neglected to focus on the manually written content within the answer.

5.3 Hypotheses

Based on the findings of the meta-study by Costa (2017) and the fact that the AfD is critical towards migration, we expect the following:

Hypothesis 1 (Discrimination against minority voters): *Inquirers with migration background receive a lower response rate from AfD candidates in both campaigns compared to inquirers without migration background.*

Note that the hypothesis tests racial discrimination independent of the topic of the inquiry.

In addition, we examine whether statistical discrimination influences response behavior. We apply the number of words that were sent in reply to our inquiries. Specifically, we expect that politicians write longer answers if they disagree with the inquirer's issue. There are two theoretical arguments from different economic disciplines behind this expectation. First, rational choice suggests that a vote-maximizing candidate is incentivized to elaborate more on an issue in order to turn the inquirer's point of view around. Standard models of political competition suggest that voters vote for the candidate with the fewest ideological difference to the own differences. Thus, the chances to be elected are highest if the candidate's and the voter's interests are aligned. Second, information economics suggests that a candidate obfuscates information for a receiver strategically in case the information is unfavorable for the receiver (e.g. Hao et al., 2001, Dewan and Myatt, 2008 and de Clippel and Rozen, 2020). Employing a standard sender-receiver-game in line with Crawford and Sobel (1982) and subsequent literature, this is met if the candidate, i.e., the sender, and the inquirer, i.e., the receiver, disagree on the issue in the inquiry. This behavior by the

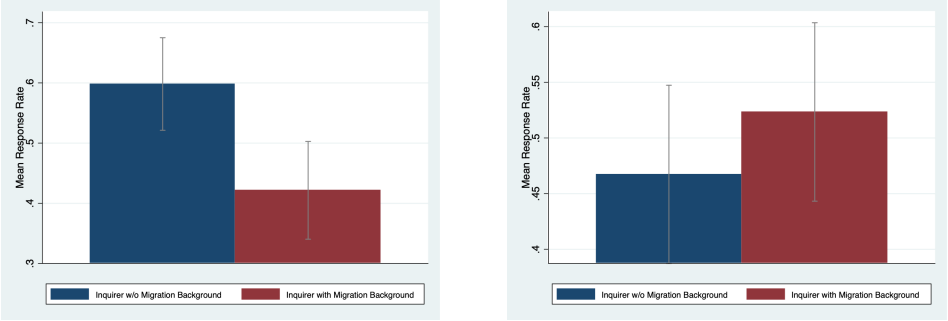
candidate also leads to longer replies facing an inquirer with diverging interests. Notice that the two approaches to expect longer answers would lead to different contents within the answers: A persuading candidate focuses on arguments strengthening the ideological point of view. An obfuscating candidate might for example put the issue in a broader context, e.g. talking about migration if confronted with dual citizenship and about measures to combat COVID-19 if asked about compulsory vaccination. To disentangle the two causes of different lengths, a close look at the content is required. We constrain ourselves to checking if statistical discrimination is prevalent at all and thus only check the length of answers.

Based on these concurring theoretical perspectives we expect the following:

Hypothesis 2 (Vote maximizing variation of length): *Candidates spend more words to answer inquiries if the candidate and the inquirer disagree on the underlying issue in both campaigns.*

5.4 Results

Summary statistics (Table 1), covariate balances of the treatment migration background (Tables 2 and 3) and robustness checks for the results (Tables 4 to 11) can be found in the online appendix.[2] First, we examine whether, within each campaign, AfD candidates discriminate against constituents based on a potential migration background:



(a) C1: Dual citizenship (b) C2: Compulsory vaccination

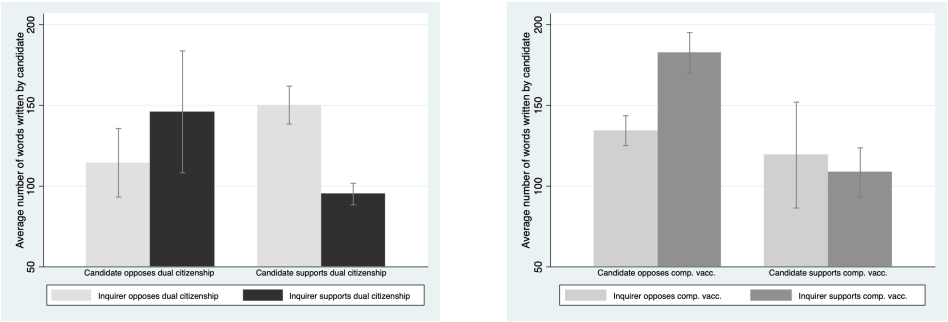
Figure 1: AfD: Discrimination against (non-)minority voters

In the first campaign the AfD candidates' responsiveness is significantly lower towards inquirers with a migration background (36.1 %) compared to inquirers without a migration background (56.7 %). This is not observable in the second campaign. Here, responsiveness is not significantly different (52.3 % for inquirers with migration background vs. 46.7 % for inquirers

[2]DOI 10.17605/OSF.IO/A3MXJ

without migration background). Thus, we conclude that AfD candidates only discriminate against constituents with migration backgrounds if the topic of the constituent's inquiry deals with migration. We confirm Hypothesis 1 only for the first campaign.

Next, we examine Hypothesis 2. We test if the length of answers in favor of an arbitrary position differs significantly depending on the inquirer's stance. The results are as follows:



(a) C1: Dual citizenship (b) C2: Compulsory vaccination

Figure 2: Length of replies by inquirer's stance and candidate's stance

Figure 2 shows that the average length of a reply supporting dual citizenship is significantly longer if the inquirer is against it compared to the case if the inquirer is in support. Contrarily, the average reply length of candidates opposing dual citizenship does not significantly differ depending on the inquirer's point of view on it. If an inquirer supports compulsory vaccination for teachers, an answer opposing compulsory vaccination is significantly longer compared to the case that the inquirer opposes it. On the contrary, the length of answers supporting compulsory vaccination does not significantly differ depending on the inquirer's stance on it. Consequently, we can confirm Hypothesis 2 only for answers in favor of dual citizenship and replies opposing compulsory vaccination.

5.5 Conclusion

This study contributes several new insights to the literature on racial discrimination by political elites (e. g. Butler and Broockman, 2011, Butler et al., 2012, Einstein and Glick, 2017). We cannot reject the finding by Costa (2017) that minority voters receive fewer answers because we have not found any significant differences in favour of minority voters in our analyses. Yet, according to our evidence, this finding depends on the topic the inquiry. Racial discrimination by politicians is not prevalent in every topic, rendering this issue a contextual phenomenon. Moreover, we find that candidates

accomplish their task to serve voters with migration backgrounds depending on whether the context of the inquiry is migration-related or not. This result might be explained by the politician's self-interest. An AfD candidate might not answer to an inquiry related to migration if the inquirer has a migration background as the party's ideology is rather against migrants. An answer might then deteriorate the chances to be elected. We cannot reject the hypothesis that candidates write more words answering an inquirer with diverging ideological interests. We find significantly longer replies in two cases: First, if the candidate is in favor of dual citizenship and the inquirer is against it. Second, if the candidate is against compulsory vaccination and an inquirer is in support of it. Hypothesis 2 holds if and only if the candidate is in line with the political mainstream. We measure mainstream views by the share of replies conveying this ideological point of view. 52.9 % are in favor of dual citizenship while only 10.0 % are against it. 74.8 % of the received replies signal stances against compulsory vaccination while only 9.0 % are in support of it. Distinguishing between rational choice arguments and information economics arguments is a fruitful avenue for future research.

Acknowledgments

We are grateful to the participants of the 12th ifo Dresden Workshop on Labor Economics and Social Policy, the 2023 SPSA Summer Virtual Conference and the Silvaplana Political Economy 2023.

Appendix

The following Table shows summary statistics on the data set.

Variable	Mean	Std. Dev.	N
Reply rate Campaign 1	0.676	0.468	1554
Reply rate Campaign 2	0.575	0.495	1554
Mean reply length Campaign 1	126.977	104.709	1097
Mean reply length Campaign 2	151.101	119.337	951
Left Party	0.163	0.37	1554
Greens	0.163	0.369	1554
SPD	0.163	0.37	1554
FDP	0.161	0.368	1554
CDU	0.155	0.362	1554
CSU	0.028	0.164	1554
Freie Wähler	0.029	0.168	1554
AfD	0.138	0.345	1554
Male candidate	0.692	0.462	1554
Age candidate	46.288	12.557	1554
Candidate with migration background	0.058	0.234	1554
GDP per capita 2018	39695.36	14685.063	1554
Unemployment rate in %	6.307	2.311	1554
Inhabitants per square km	849.099	1153.558	1554
Share of people with migration background	25.442	9.210	1554
Voter turnout in 2017 in %	0.762	0.034	1554

Table 1: Summary Statistics

The following two tables provide covariate balances of the treatment migration background for both campaigns.

Variable	Without migration background	With migration background	mean diff.	p-value
Dummy male candidate	0.71	0.67	0.04	0.08
	(0.02)	(0.02)		
Age candidate	46.52	46.05	0.46	0.47
	(0.45)	(0.45)		
Dummy candidate with	0.06	0.05	0.01	0.31
migration background	(0.01)	(0.01)		
GDP per capita	39954	39432.7	521.30	0.48
	(528.40)	(525.34)		
Uneployment rate	6.33	6.28	0.05	0.69
in %	(0.08)	(0.08)		
Inhabitants per	832.88	865.79	-32.91	0.57
square km	(41.00)	(41.80)		
Share of people with	25.41	25.47	-0.06	0.89
migration background in %	(0.33)	(0.33)		
Voter turnout	76.22	76.14	0.08	0.65
in 2017 %	(0.12)	(0.12)		

Table 2: Covariate balance: Campaign 1: Dual citizenship

Variable	Without migration background	With migration background	mean diff.	p-value
Dummy male candidate	0.70	0.68	0.02	0.34
	(0.02)	(0.02)		
Age candidate	45.74	46.83	-1.09	0.09
	(0.45)	(0.45)		
Dummy candidate with	0.05	0.06	-0.01	0.52
migration background	(0.01)	(0.01)		
GDP per capita	40017.91	39373.64	644.27	0.39
	(520.71)	(532.92)		
Uneployment rate	6.33	6.29	0.04	0.72
in %	(0.09)	(0.08)		
Inhabitants per	867.54	830.70	-77.98	0.53
square km	(41.81)	(40.97)		
Share of people with	25.69	25.19	0.50	0.28
migration background in %	(0.32)	(0.34)		
Voter turnout	76.09	76.28	-0.19	0.26
in 2017 %	(0.12)	(0.12)		

Table 3: Covariate balance: Campaign 2: Compulsory vaccination

The following tables show t-tests on the hypotheses.

	Campaign 1	**Campaign 2**
Without migration background		
N	112	107
Mean reply rate	59.82 %	46.73 %
With migration background		
N	102	107
Mean reply rate	42.16 %	52.34 %
Differential	0.18	-0.06
$H_a : differential \neq 0$	$p = 0.01$	$p = 0.41$
$H_a : differential < 0$	$p = 1.00$	$p = 0.21$
$H_a : differential > 0$	$p = 0.00$	$p = 0.79$

Table 4: T-tests on the results of Hypothesis 1: AfD candidates

	Campaign 1	**Campaign 2**
Without migration background		
N	671	669
Mean reply rate	70.64 %	60.69 %
With migration background		
N	669	671
Mean reply rate	69.66 %	56.78 %
Differential	0.01	0.04
$H_a : differential \neq 0$	$p = 0.69$	$p = 0.15$
$H_a : differential < 0$	$p = 0.65$	$p = 0.93$
$H_a : differential > 0$	$p = 0.35$	$p = 0.07$

Table 5: Differences in mean reply rates: Non-AfD candidates

	Candidate pro dual citizenship	**Candidate against dual citizenship**
Inquirer pro dual citizenship		
N	362	35
Mean reply length	95.11	146
Inquirer against dual citizenship		
N	224	75
Mean reply length	150.19	114.47
Differential	-55.08	31.53
$H_a : differential \neq 0$	$p = 0.00$	$p = 0.20$
$H_a : differential < 0$	$p = 0.00$	$p = 0.90$
$H_a : differential > 0$	$p = 1.00$	$p = 0.10$

Table 6: T-tests on the results of Hypothesis 2: Campaign 1

	Candidate against comp. vaccination	**Candidate pro comp. vaccination**
Inquirer against comp. vaccination		
N	406	13
Mean reply length	134.37	119.23
Inquirer pro comp. vaccination		
N	262	67
Mean reply length	182.51	108.58
Differential	-48.13	10.65
$H_a : differential \neq 0$	$p = 0.00$	$p = 0.64$
$H_a : differential < 0$	$p = 0.00$	$p = 0.68$
$H_a : differential > 0$	$p = 1.00$	$p = 0.32$

Table 7: T-tests on the results of Hypothesis 2: Campaign 2

The following tables show logit estimations on the hypotheses.

Variable	(1) Campaign 1 Logits	(2) Campaign 1 Margins
Inquirer pro dual citizenship	0.234**	0.0492**
	(0.111)	(0.0233)
Dummy AfD	-0.285	-0.146***
	(0.226)	(0.0395)
Dummy inquirer with migration background	-0.0307	-0.0301
	(0.120)	(0.0233)
AfD x Inquirer with migration background	-0.702**	
	(0.310)	
Dummy male candidate	0.133	0.0279
	(0.124)	(0.0260)
Age candidate	-0.00202	-0.000425
	(0.00453)	(0.000953)
Dummy candidate with migration background	-0.300	-0.0631
	(0.232)	(0.0488)
GDP per capita in €	$-1.78*10^{-6}$	$-3.74*10^{-7}$
	$(5.70*10^{-6})$	$(1.20*10^{-6})$
Unemployment rate in %	0.0784*	0.0165*
	(0.0435)	(0.00911)
Inhabitants per square km	-0.000162*	$-3.42*10^{-5}$*
	$(9.20*10^{-5})$	$(1.93*10^{-5})$
Share of foreigners in %	3.790**	0.798**
	(1.869)	(0.392)
Voter turnout in 2017	4.672**	0.983**
	(2.322)	(0.486)
Dummy: Left Party, Greens, SPD	0.366***	0.0770***
	(0.124)	(0.0258)
Constant	-3.695*	
	(1.950)	
Observations	1,554	1,554

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Logit estimation on Hypothesis 1, Campaign 1

Variable	(1) Campaign 2 Logits	(2) Campaign 2 Margins
Inquirer pro compulsory vaccination	-0.106	-0.0253
	(0.104)	(0.0248)
Dummy AfD	-0.432**	-0.0592
	(0.220)	(0.0398)
Dummy inquirer with migration background	-0.151	-0.0234
	(0.113)	(0.0249)
AfD x Inquirer with migration background	0.374	
	(0.297)	
Dummy male candidate	0.328***	0.0783***
	(0.116)	(0.0274)
Age candidate	0.00199	0.000474
	(0.00430)	(0.000103)
Dummy candidate with migration background	-0.228	-0.0546
	(0.224)	(0.0536)
GDP per capita in €	$-5.79*10^{-6}$	$-1.38*10^{-6}$
	$(5.43*10^{-6})$	$(1.30*10^{-6})$
Unemployment rate in %	-0.0187	-0.00446
	(0.0455)	(0.0109)
Inhabitants per square km	$-1.48*10^{-5}$	$-3.55*10^{-6}$
	$(9.36*10^{-5})$	$(2.24*10^{-5})$
Share of foreigners in %	1.780	0.425
	(2.216)	(0.529)
Voter turnout in 2017	0.200	0.0478
	(2.227)	(0.532)
Incidence in district on 22 Sept, 2021	0.00533	0.000127
	(0.00392)	(0.000935)
Incidence in district on 15 Sept, 2021	-0.001943	-0.000462
	(0.00336)	(0.000803)
Share of people vaccinated in district	-0.00559	-0.00134
	(0.00332)	(0.00793)
Share of people aged 12-17 vaccinated in state	0.00433	0.00103
	(0.0197)	(0.00471)
Dummy: Left Party, Greens, SPD	0.392***	0.0936***
	(0.116)	(0.0273)
Constant	0.00948	
	(2.442)	
Observations	1,554	1,554

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Logit estimation on Hypothesis 1, Campaign 2

Variable	(1) Campaign 1 Logits	(2) Campaign 1 Margins
Inquirer pro dual citizenship	31.54	-41.03***
	(25.91)	(8.282)
Candidate pro dual citizenship	19.48	-29.69*
	(16.53)	(15.98)
Inquirer pro x Candidate pro	-86.19***	
	(27.14)	
Dummy male candidate	-7.893	-7.893
	(7.501)	(7.501)
Age candidate	-0.0960	-0.0960
	(0.274)	(0.274)
Dummy candidate with migration background	-13.65	-13.65
	(11.12)	(11.12)
GDP per capita in €	-0.000630*	-0.000630*
	(0.000329)	(0.000329)
Unemployment rate in %	-2.570	-2.570
	(2.712)	(2.712)
Inhabitants per square km	-0.00673	-0.00673
	(0.00637)	(0.00637)
Share of foreigners in %	95.30	95.30
	(124.2)	(124.2)
Voter turnout in 2017	27.72	27.72
	(159.0)	(159.0)
Dummy: Left Party, Greens, SPD	14.79*	14.79*
	(8.728)	(8.728)
Constant	130.7	
	(135.9)	
Observations	696	696

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Logit estimation on Hypothesis 2, Campaign 1

Variable	(1) Campaign 1 Logits	(2) Campaign 1 Margins
Inquirer pro compulsory vaccination	48.23***	41.57***
	(9.540)	(8.867)
Inquirer against compulsory vaccination	-14.77	-42.16***
	(21.00)	(13.19)
Inquirer pro x Candidate pro	-62.27***	
	(23.70)	
Dummy male candidate	1.324	1.324
	(8.936)	(8.936)
Age candidate	-0.600*	-0.600*
	(0.324)	(0.324)
Dummy candidate with migration background	-27.08	-27.08
	(21.63)	(21.63)
GDP per capita in €	$-9.14*10^{-5}$	$-9.14*10^{-5}$
	(0.000411)	(0.000411)
Unemployment rate in %	-1.918	-1.918
	(3.259)	(3.259)
Inhabitants per square km	0.00258	0.00258
	(0.00775)	(0.00775)
Share of foreigners in %	79.95	79.95
	(146.8)	(146.8)
Voter turnout in 2017	-46.74	-46.74
	(167.6)	(167.6)
Dummy: Left Party, Greens, SPD	7.015	7.015
	(8.893)	(8.893)
Constant	192.7	
	(142.1)	
Observations	748	748

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Logit estimation on Hypothesis 2, Campaign 2

6 The Politicization of Immigration in Parliaments Evidence from German State Legislative Sessions

Abstract

This article makes two new contributions to the literature on the politicization of immigration. First, it examines whether politicians politicize immigration in parliaments. Second, the two dimensions of politicization, salience and political polarization, are measured qualitatively. Topic modeling is used to analyze speeches held by each right-wing AfD legislators and Green legislators in three state parliaments during the peek of the so-called "refugee crisis" in Germany. The topic models show that, in contrast to Green legislators, AfD legislators address various other issues in speeches dealing with immigration. This is evidence that only AfD legislators attempt to increase the salience of immigration. Moreover, AfD legislators frame immigrants as a threat, while Green legislators frame immigrants as victims. This is evidence of political polarization. Thus, qualitative measures for salience and polarization suggest that the AfD politicized the issue immigration in state parliaments.

Keywords: Politicization, immigration, natural language processing, salience, polarization

6.1 Introduction

Immigration turned out to be one of the most debated public issues in Europe in the last decade. This issue polarized not only the society, but also the political landscape in these countries (Gattinara and Morales, 2017, and Maxwell, 2019 and van der Brug and Harteveld, 2021). Immigration and the subsequent polarization caused both significant variations in the agendas of political parties and changes in electoral results. Literature on the latter issue has shown that many incumbent parties lost large voter shares in Western European countries while especially right-wing populist parties gained support due to the polarization (Akkerman, 2018, de Vries, 2018, Halikiopoulou, 2018, Jesse, 2018, Niedermayer, 2018).

An important question behind these results is how immigration could become such an important issue to trigger these changes. According to van der Brug et al. (2015), politicized issues play such an important role that they can shape party competition and public opinion. They also provide a definition for politicized issues. Following their framework, an issue has to be (i) salient and (ii) polarized in terms of conflicting opinions between parties in order to be considered politicized (van der Brug et al., 2015).

This article examines whether immigration was politicized in German state parliaments using qualitative criteria for salience and political polarization. As a first step, I analyze what issues right-wing AfD legislators and Green legislators address in speeches that deal with immigration. All speeches from three state parliaments during the peak of the German refugee crisis[1] between August 2015 and March 2016 are covered. In a second step, I only consider those sentences of the prementioned speeches that contain words of the issue immigration. Latent Semantic Index ("LSI") models, which belong to Natural language processing ("NLP") are applied in both steps. The first step shows that, across the different parliaments, AfD legislators attempt to increase the salience of immigration in their speeches. They relate immigration to various other issues, such as international relations and law, democratic processes and politics from other German states. On the contrary, Greens focus on issues much closer to immigration, e.g. accommodation and integration. The second step provides evidence that while AfD legislators frame immigration as a threat, Green legislators frame immigrants as victims as defined by Benson (2013) and Hovden and Mjelde (2019). These differences hint at political polarization and, taking into account the results from the first step, at the politicization of the issue immigration.

[1] This term is mainly employed by media and refers to the time period between 2014 and 2016. The number of asylum applications reached several heights in Germany during this time span. The term is used in this article for clarity reasons. The assessment leading to this term is not supported.

Moreover, the AfD drives the politicization. Since the Greens can be regarded as an established party with a fixed agenda on immigration and the AfD was a political entrepreneur at that time, the results also suggest that the AfD strategically politicized immigration. This finding thus supports several contemporary theories from political competition, such as the (neo-)cleavage theory and the issue entrepreneurship theory. Notably, if salience was measured by the share of sentences dealing with immigration, results would suggest that both parties raised the salience of immigration equally. Thus, the results differ between the standard quantitative approach and the newly introduced qualitative approach in this study. This underscores the important role qualitative measures can play for studying salience, political polarization and politicization.

This study contributes to a young and fast-growing strand of literature on the politicization of immigration in Europe during the last decade. Politicization is attributed to different channels and causes by several sub-strands of literature. Some work examines whether migration-related socio-economic variables, such as the migration population, can explain the politicization in a sense that political attention increases (Hainmueller and Hopkins, 2014, van der Brug et al., 2015 and Green-Pedersen and Otjes, 2019). For example, Green-Pedersen and Otjes (2019) show that there is a positive correlation between political attention devoted to immigration and increasing numbers of migration born people in Western Europe. Other work yields evidence that socio-economic factors do not explain increases in the politicization. Instead, these studies find that parties increase the politicization of immigration. There is disagreement on what parties elicit politicization, though. While some literature shows that government parties, especially from the center-right, politicize immigration (e.g. Green-Pedersen and Krogstrup, 2008, Meyer and Rosenberger, 2015 and van der Brug et al., 2015), newer studies imply that radical-right or right-wing parties are the driving forces of the politicization of immigration (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022). The latter findings support theories that right-wing parties play an important role to explain why immigration has become an essential issue in the last decade. These include the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) and the issue entrepreneurship theory (e.g. Hobolt and de Vries, 2015 and Buisseret and van Weelden, 2020).

Following the recent findings that right-wing parties induce the politicization of immigration, this paper investigates whether state legislators from the German right-wing AfD elicited politicization. Contrary to related work (e.g. Hutter and Grande, 2014, Meyer and Rosenberger, 2015, Grande et al., 2019, Mendelsohn et al., 2021 and Gessler and Hunger, 2022), this study does not examine data from social media, party manifestos or press releases,

but from speeches in the parliament during the peak of the refugee crisis in Germany. Additionally, qualitative instead of quantitative measures (as e.g. Hutter and Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022 employ) are used to detect politicization. The results support the abovementioned finding that right-wing parties politicize immigration with evidence from the daily political arena during charged times.

The rest of the article is organized as follows: In section 2, the data and methods are explained. I derive the hypotheses in section 3. The results are presented in section 4 and discussed in section 5. Section 6 concludes. Supplementary material can be found in the appendix.

6.2 Data and Methods

In this study, I consider speeches of AfD and Green state legislators in the parliaments of the states Saxony, Thuringia and Brandenburg from August 10, 2015 to March 31, 2016. This type of data set is different to most related work on the politicization of immigration (e.g. Hutter and Grande, 2014, Meyer and Rosenberger, 2015, Grande et al., 2019, Mendelsohn et al., 2021 and Gessler and Hunger, 2022). The nature of the data set in this study allows to check for whether right-wing parties also increase politicization during legislative processes. The analysis is thus a supplement to the prementioned literature.

The choice concerning the parliaments stems from the status of the right-wing AfD. The national parliament would be a natural source for this study, yet the AfD had not been being part of the national parliament until 2017. On the contrary, the AfD had parliamentary status in the state parliaments of Saxony, Thuringia and Brandenburg in the considered time span. Additionally, it was in the opposition in all three parliaments, which ensures good comparability. As a contrast to the right-wing AfD, the speeches of Green state legislators from these states are considered. Importantly, the Greens also enjoyed parliamentary status in the three state parliaments in concern. While the AfD is considered a party that increased its visibility with migration-skeptical views (Berning, 2017, Art, 2018 and Arzheimer and Berning, 2019), the Greens are regarded as their cosmopolitan antagonist (Bayram, 2017, Franz et al., 2019 and Hartmann, 2020). The distinction between these two parties provides a good basis to examine polarization on the issue immigration. This is especially valid for the selected states, which are all part of Eastern Germany. The AfD is considered to be stronger right-wing in Eastern Germany than in Western Germany (Kopke, 2017 and Linhart, 2017).

The time span from August 10, 2015 to March 31, 2016 accounts for a very charged time during the refugee crisis (see, e.g., Franzmann, 2019). While there is, to the best of my knowledge, no absolute definition for the peak of the crisis in Germany, this period contains important events within the crisis. August 10, 2015 marks an important date in the early stages of the crisis as a huge wave of refugees arrived in the time following that day. Moreover, on March 18, 2016, the European Union and Turkey signed the meaningful EU-Turkey readmission agreement, mitigating larger migration into Europe from that point on (Haller, 2017). In order to capture short-term reactions on this deal, I prolong the period considered until the end of the month the treaty was sealed.

I examine politicization of the issue immigration in two steps. This procedure is inspired by the framework to study politicization by van der Brug et al. (2015). According to their definition, political issues can be classified within a 2*2-dimensional matrix. The first dimension depicts how salient the issue is. The second dimension shows how polarized stances of parties on an arbitrary issue are. If and only if the issue is both salient and politically polarized, it is considered a politicized issue (van der Brug et al., 2015). Several studies on the politicization of immigration have employed this approach (e.g. Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022), yet with different sources of data compared to this article.

In contrast to related work (e.g. Hutter and Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022), I do not utilize the share of sentences dealing with immigration to measure salience. Instead, I examine what issues politicians of the AfD and the Greens, respectively, address during their speeches in which immigration is covered. The criterion for an arbitrary speech to be part of the analysis is that at least one word directly related to immigration is used in this speech. This allows to measure salience in a sense that politicians relate the issue immigration to other issues. According to this approach, a higher salience of immigration implies that it interacts with or affects more other issues. This hints at an increased importance of immigration. Politicians can employ this mechanism in state legislative sessions, the source of the data in this study, easily. Debating on different issues highlighted by the agenda, they can include statements about immigration to link it with the issue and thus to increase its salience. Consequently, this study treats salience as a qualitative measure.

The second dimension of politicization in line with the framework by van der Brug et al. (2015) is polarization between parties. Similarly to salience, this article employs a qualitative approach to examine the prevalence of polarization. This approach is different to a strand of work focusing on quantitative methods based on the ideological distance between parties (e.g. Hutter and

Grande, 2014, Grande et al., 2019, Lauwers et al., 2021, and Hutter and Kriesi, 2022). While the analysis of salience requires to filter all speeches containing at least one word of the issue immigration, only sentences comprising at least one word of the issue immigration are covered by this step. This procedure enables to study what framing legislators use debating on immigration. A large body of literature has shown the important role framing plays in electoral competition (e.g. Slothuus and de Vreese, 2010, Elias et al., 2015 and Vliegenhart et al., 2016). In this study, I examine whether politicians of the AfD and Greens, respectively, employ different frames on the same issue, immigration, during state legislative sessions. This would hint at polarization. Several studies on the framing of immigration utilize "issue-specific" framing categories with different subcategories to distinguish different frames (e.g. Benson, 2013, Hovden and Mjelde, 2019 and Mendelsohn et al., 2021). According to the definition of framing by Benson (2013), a frame contains certain aspects that account for a specific definition of an issue (see also Entman, 1993). The frames used by Benson (2013) let immigrants appear as "victims", "heroes" or "threats" (Benson, 2013, Hovden and Mjelde, 2019 and Mendelsohn et al., 2021). An overview of the categories and subcategories can be found in the appendix. If the topics depicted in the analysis imply that framing differs on party level, this will be a clear indicator for polarization within the legislative debate.

If these two steps reveal that the issue immigration is both salient and polarized, there will be evidence that it was a politicized issue in the state legislative process during the peak of the refugee crisis in Germany. As outlined above, all speeches in the state parliaments of Saxony, Thuringia and Brandenburg held by legislators of the Greens and of the AfD between August 10, 2015 and March 31, 2016 are in concern. The state parliament sessions are minuted on a word by word basis. The minutes are available on the webpage of the respective state parliament. Thus, the sample accounts for a full-testing of the state legislative process in the three states in the regarded time span. The speeches and sentences containing at least one word of the issue immigration are then filtered automatically as described in the description of steps to analyze salience and polarization.

NLP is a method of rapidly increasing popularity to analyze the content of texts in various fields, including politics (e.g. Chatsiou and Mikhaylov, 2020 and Terechshenko et al., 2020). NLP approaches have been applied to examine political communication (e.g. Takikawa and Nagayoshi, 2017 and Cabot et al., 2020) and also to structure party manifestos in different dimensions (e.g. Olbrich and Banisch, 2021). Studying salience and polarization qualitatively, NLP delivers adequate tools for the analysis. The filtered speeches and sentences are analyzed on party and state level. Given that three states and two parties are in scope, there are six subsets of data

containing speeches as well as six subsets comprising sentences. These subsets are each then cleansed (e.g. erasing common stop words from standard lists).

NLP contains different approaches to conduct topic modeling. The steps of analysis require topic modeling to detect issues and frames as outlined above. LSI (Deerwester et al., 1990) and Latent Dirichlet Allocation ("LDA", Blei et al., 2003) are two frequently used approaches across research subjects. Both methods aim to solve the problem of vocabulary mismatch employing latent space models (Gupta and Varma, 2017). There are important differences between the two methods, though. LSI works on the basis of a spectral analysis of the corresponding term-document matrix and is an information retrieval technique (Deerwester et al., 1990, Zheng et al., 2016 and Potha and Stamatatos, 2017). On the contrary, LDA is trained with representations for documents as distributions over word topics and is considered a celebrated generative model (Blei et al., 2003, Zheng et al., 2016 and Potha and Stamatatos, 2017). Both techniques feature specific advantages over each other. On the one hand, LDA generally provides a higher accuracy (Teh et al., 2006 and Bertalan and Ruiz, 2019). On the other hand, LSI has two advantages. LSI models are trained faster, which means, it requires fewer data to yield precise results. In addition, LSI performs better than LDA if the documents are similar (Teh et al., 2006, Anaya, 2011 and Bertalan and Ruiz, 2019). These different strengths make LSI the better method for this study for two reasons. First, the data set is relatively small compared to studies dealing with, e.g., data sets from larger time spans. Second, the documents in the data set are similar. The documents are all from legislative sessions and comprise speeches on the issue immigration by candidates of one specific party. The argument is even stronger for the data set which contains sentences on the issue immigration.

The number of topics and words within each topic to run LSI differ a lot across sizes of data sets and research questions (e.g. Deerwester et al., 1990, Gupta and Varma, 2017, Potha and Stamatatos, 2017 and Bertalan and Ruiz, 2019). There is no standard or rule to find out how many topics and words within each topic are optimal for LSI. I conduct the analysis of each subset with five topics and ten words per topic. This number of topics is relatively low compared to other work. Yet, it is sufficient for each step conducted and especially suitable for the size of the subsets. The first step aims at finding other issues than immigration in speeches with immigration. This requires fewer topics than, e.g., detecting all topics of a specific data set (e.g. Bertalan and Ruiz, 2019). Similarly, the second step covers the analysis of different frames. This can also be achieved with a relatively low number of topics.

6.3 Theoretical Background and Hypotheses

A large strand of literature has convincingly shown that right-wing parties increased the politicization of the issue immigration (e.g. Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022). The approach by van der Brug et al. (2015), which is the basis of the framework in this study, has been employed by several studies in this area. In this study, I attempt to confirm the finding that immigration was politicized during the time span in the three state parliaments considered with qualitative measures of salience and polarization and a scarcely considered source of data.

I expect that this effect is rather driven by the AfD as suggested by related literature. As defined above, the first ingredient to increase politicization is to render an issue salient. There are several reasons why the AfD had an incentive to increase the salience of immigration during the refugee crisis. Theoretical literature suggests that immigration may be brought to the political arena by right-wing parties. According to the issue entrepreneurship theory (Hobolt and de Vries, 2015), right-wing parties have an incentive to introduce new issues to electoral competition in order to gain voters' support. This process involves the increase of salience to maximize the aspired effects. Other theoretical literature also supports that new parties challenge mainstream parties with new issues (e.g. Aragonès et al., 2015 and Buisseret and van Weelden, 2020). Notably, the time span covers the peak of the refugee crisis in Germany. Thus, incentives to introduce the issue immigration to the state legislative process can be expected to be stronger than in less charged times. Moreover, the AfD was not part of the national parliament at that time. The AfD had been a party with a focus on euro-scepticism before 2015. The refugee crisis opened up new dimensions for political agendas. As a result, the time span covered in this study can be considered a turning point for the AfD, shifting from only euro-scepticism to a party introducing immigration to the political arena with a very critical position (Jesse, 2018).

An increasing number of theoretical studies from economics on electoral competition also includes the salience of issues in the model. Salience is then an important aspect to determine what issues parties focus on (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). If the AfD considers immigration to be an advantageous issue for electoral competition, which is implied by the issue entrepreneurship theory, this strand of work also suggests that the AfD will have an incentive to increase salience. Similar arguments hinting at strategic behavior by the AfD to increase salience of immigration are also implied by the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018).

In order to polarize the electorate effectively with a new issue, raising its salience is key.

The next argument supporting the hypothesis that the AfD increased the salience of immigration stems from the concept of issue ownership. This concept suggests that a specific party or candidate emphasizes a certain issue because the party or candidate is better at handling the issue than the competitors (see, e.g., Petrocik, 1996). Several studies show that right-wing parties owned the issue migration in the mid of the 2010s (e.g. Dennison and Goodwin, 2015). Importantly, the AfD took ownership of this issue in the considered time span in this study (Arzheimer and Berning, 2019 and Franzmann, 2019). This insight strengthens the expectation that the AfD candidates increased the salience of immigration. If the AfD was considered more competent at the issue immigration there would be a clear incentive to make this issue more visible in the debate.

Finally, there is some empirical support that right-wing parties link immigration with other issues, which is the indicator for salience in this study. Gessler and Hunger (2022) reveal that these parties connected immigration with European integration in Austria, Switzerland and Germany based on press releases.

While several arguments suggest that the AfD aims at reaching higher levels of salience for the issue immigration, the cosmopolitan Greens are not expected to twin the issue immigration with other issues. Consequently, speeches of these party should not hint at an intended increase in salience. The Greens were already established in the German political landscape in 2015, contrary to the AfD. As a result, the Greens were not in need to introduce new issues to the political arena. Another difference to the AfD is that supporting immigration had already been part of the agenda of the Greens before the refugee crisis. As outlined above, the AfD was a relatively new party with a high emphasis on euro-scepticism at that time. Intuitively, introducing a new issue with a polarizing position yields a higher incentive to raise salience than explaining the stance on an issue that has already been part of the own agenda before.

Given the abovementioned arguments, the expectations on the issues addressed by state legislators of the AfD and of the Greens in speeches including the immigration are as follows:

Hypothesis 1 (Salience of immigration): *AfD legislators' speeches in all states comprising the issue immigration also deal with issues not directly related to immigration. Green legislators' respective speeches in all states only deal with immigration-related issues.*

The second dimension of politicization in this framework is polarization, in line with the work by van der Brug et al. (2015). An issue is considered polarized if stances on it differ between parties. This study tests whether polarization is prevalent in a sense that frames of the issue immigration employed by AfD legislators differ from those utilized by Green legislators. The analysis is based on the distinction between different frames of immigration used by Benson (2013) and Mendelsohn et al. (2021). This study employs the same definition of a frame as Benson (2013). The main categories consider immigrants "victims", "heroes" or "threats". While the first two categories hint at a supportive and positive framing of immigration, the latter accounts for a skeptical and negative framing.

The ideological positions the AfD and the Greens each represent suggest that their politicians employ different frames in speeches during state legislative sessions. As described above, the AfD is widely considered a party skeptical on immigration (Berning, 2017, Art, 2018 and Arzheimer and Berning, 2019), whereas the Green are regarded as their ideological counterpart in support of immigration (Bayram, 2017, Franz et al., 2019 and Hartmann, 2020). Applying the aforementioned scheme by Benson (2013) then suggests that AfD politicians frame the issue immigration as a threat. On the contrary, the frames in the respective topics by Green politicians can be attributed to the categories victims and heroes. The different categories of frames represented in topics result in a clear indicator for polarization. In addition to the distinct differences in the political agendas, the arguments implying that the AfD has an incentive to increase the salience of the issue immigration also indicate that the AfD has an incentive to elicit polarization. Following the issue entrepreneurship theory, the AfD should aim to elicit polarization to emphasize the opposite stance on immigration compared to established parties, such as the Greens. The argument from the cleavage theory is similar. The effect of a cleavage introduced to the political arena increases in the distance between the positions covered by the competing parties. Finally, there is empirical evidence that the AfD employs a rougher tone addressing immigration (Kopke, 2017).

In line with the prementioned arguments, the expectations on topics addressed by state legislators of the AfD and of the Greens in sentences containing the issue immigration are as follows:

Hypothesis 2 (Polarization between parties): *AfD legislators' sentences dealing with immigration reveal a framing of threats within the topics in all states. The respective sentences by Green legislators show frames of victims and heroes in all states.*

If framing of immigration differ on party level as outlined in Hypothesis 2, this will be evidence of political polarization related to the issue immigra-

tion between the two considered parties in the state legislative process. As defined in the framework by van der Brug et al. (2015), polarization prevails if positions by parties are very different, which is met if Hypothesis 2 can be confirmed. Notice that, if the results affirm both hypotheses, there will be evidence that the issue immigration is politicized in the context of this study. Because the AfD strengthens salience in this case, politicization is driven mainly by the AfD. In order to detect politicization, the second hypothesis has to be confirmed, which means that polarization given by different frames is a necessary condition. This does not apply to the first hypothesis. Politicization can be reached if any of the two parties or both parties increase salience by addressing issues not related to immigration in the respective speeches. Parties that engage in strengthening salience elicit politicization in case polarization pertains as depicted in Hypothesis 2. The hypotheses in line with several strands of literature yet suggest that AfD legislators politicize the issue immigration. They achieve this by increasing its salience and employing a negative framing contrary to the positive framing by Green legislators.

6.4 Results

Before presenting the analyses of the hypotheses, I provide some summary statistics on the data set. Note that "SN" stands for Saxony, "TH" for Thuringia and "BB" for Brandenburg. Speeches and sentences dealing with the issue immigration are defined such that they contain at least one of the following words or compounds: asyl, immigrant, refugee, immigration, fled[2].

Number of / State: Party	Legislative sessions	Total speeches	Speeches immigration	Share: Speeches immigration	Sentences immigration
SN: AfD	14	443	77	17.4 %	382
SN: Greens	14	298	49	16.4 %	166
TH: AfD	23	409	104	25.4 %	555
TH: Greens	23	79	22	27.8 %	161
BB: AfD	10	220	64	29.1 %	248
BB: Greens	10	194	48	24.7 %	285

Table 1: Summary statistics

Table 1 reveals that the share of speeches held from August 10, 2015 to March 31, 2016 related to immigration do not differ much between AfD leg-

[2]The German words are: Asyl, Migrant, Flüchtling, Migration, Geflüchtet, geflüchtet, Zuwander, zugewandert. Notice that immigrant, immigration and refugees have more than one valid translation in German and that some German words are shortened to gather compounds.

islators and Green legislators in SN and TH. The biggest difference prevails in BB, where the share of speeches containing the issue immigration is by 4.4 percentage points higher for AfD legislators compared to Green legislators. There are notable differences between state parliaments, though. Across parties, the share of speeches comprising the issue immigration as defined is higher in TH and BB compared to SN. If this study were to use a standard quantitative approach to measure salience of an arbitrary issue this would be evidence to conclude that the issue immigration was more salient in the peak of refugee crisis in TH and BB than in SN. This is due to both parties' more frequent focus on the issue.

Next, I present the results on the topics legislators of the AfD and of the Greens address in their speeches containing the issue immigration across the different states. This analysis aims to test Hypothesis 1 for each state. The following two tables show the topics from the speeches held by each AfD and Green legislators in SN[3]. In the right column, each topic is summarized by a key word.

No.	Words	Description
1	request, citizens, euro, million, germany, applicant for asylum, refugee, human, saxony, already	request costs
2	euro, million, rural district, independent, local authority, local, amount, city, separate estate, space	costs constitution
3	pallas[4], albrecht, asylum law, immigration, consider, agreed, use, voice, bartl[5], opinion	state politicians asylum law
4	property, square meter, million, euro, housing space, vacancy, property, vacant, administrative order, request	housing costs
5	leipzig, begin, state minister, council for refugees, equality, translator, mandatory, conduct, convey, anyway	integration via language education

Table 2a: Topics in speeches: AfD in SN

No.	Words	Description
1	request, saxony, human, integration, commune, afd, political, city, faction, tillich[6]	AfD request on integration
2	state of law, commune, tillich, municipality, integration, heidenau, city, monopoly on the use of force, force, worth	federal structure
3	commune, city, municipality, jewish, organization for immigrants, state minister, hungary, afd, european, organization for immigrants of the state	organizations for immigrants
4	school, youths, child, state of law, ressource, politics, integration, hungary, immigration background, students	education ressources
5	interview, hungary, commune, safety, draft bill, state of law, coalition, playing soccer, afd, jewish	safety state of law

Table 2b: Topics in speeches: Greens in SN

Tables 2a and 2b yield evidence that both legislators of the AfD and legislators of the Greens in SN address issues related to immigration in speeches

[3]Words are translated from German into English. Note that German compounds cannot be translated with an English coumpound in many cases, which results in more than one word in the translation. Topics in German can be found in the appendix.

[4]Albrecht Pallas: state legislator, Social Democrat (SPD)

[5]Klaus Bartl: state legislator for the left party

[6]Stanislaw Tillich: prime minister of Saxony, Christ Democrat (CDU)

which contain at least one word of the issue immigration. Moreover, AfD politicians include another issue, which is the federal structure. Thus, Hypothesis 1 cannot be rejected for SN. In addition, AfD legislators mention costs in three of the five topics. This is not met in the respective speeches by Green legislators.

Next, speeches held by AfD legislators and Green legislators in TH are analyzed analogously:

No.	Words	Description
1	euro, local authority, applicant for asylum, draft bill, state government, democracy, million, Thuringian, school, certainly	costs lawmaking
2	media information, organizer, consumer protection, justice, immigration, launiger[7] minister, petty bourgeois, xenophobic, demonstration	immigration law demonstration
3	democracy, referendum, polling, citizens' initiative, people, direct, euro, constitution, media information, citizen	pure democracy
4	local authority, student, euro, sport club, school, teacher, million, gymnasium, local, local government reorganization	local educational infrastructure costs
5	sport club, school, europe, gymnasium, local authority, EU, student, democracy, sport, acceptance rate	european democracy local educational infrastructure

Table 3a: Topics in speeches: AfD in TH

No.	Words	Description
1	euro, refugee, million, human, day, disposal, school, cdu, request, subsequent	costs request
2	interview, draft bill, oral, sport, youth, additional question, document, legislator, committee, session	legislative session
3	education for adults, fit, euro, million, day, munich, strengthen, refugee, maybe, sponsor	optimization of refugee education
4	document, additional question, legislator, insulation, oral, accommodation for refugees, request, state secretary, götz[8], assault	request refugee protection
5	municipality, integration of refugees, social workers at schools (female), school related, education of adults, day, social workers at schools (male), municipality, social work for the youth, organizer	education and social work for integration

Table 3b: Topics in speeches: Greens in TH

Tables 3a and 3b reveal that AfD candidates include topics addressing democracy in speeches containing the issue immigration in SN. These are topic three and topic five. This result shows that those speeches also cover wider issues with which the issue immigration is linked. This pattern cannot be found within the respective speeches delivered by the Greens. The second topic is not directly related to immigration, but an administrative one. Combining the findings on side of the AfD and on side of the Greens, there is evidence that AfD legislators attempt to increase the salience of the issue immigration as outlined in Hypothesis 1. This does not apply to Green legislators in TH. As a result, Hypothesis 1 is confirmed for TH.

[7]Dieter Launiger: Minister of migration, justice and consumer protection in Thuringia, Green

[8]Probably a reference to Götz Kubitschek, a right-wing acitivist

As a last step to examine Hypothesis 1, speeches of AfD legislators and Green legislators in BB are analyzed:

No.	Words	Description
1	political, human, say, sanction, brandenburg, state government, politics, euro, state, cdu	state politics
2	sanction, russia, economy, russian, political, german, partner, medium-sized, reach, relationship	economic partnership between Russia and Germany
3	kretschmann[9], teacher, facility, east, baden-württemberg, greens, school, municipality, prime minister, winfried	Winfried Kretschmann schools
4	school, facility, teacher, accomodate, gymnasium, tent, use, child, space, financial	accommodation at schools
5	kretschmann, force, east, baden-württemberg, brandenburgian, winfried, available, distribution, green, plumber	Winfried Kretschmann violence in Brandenburg

Table 4a: Topics in speeches: AfD in BB

No.	Words	Description
1	integration, shared accommodation, state, euro, good, fled, million, human, request, brandenburg	integration costs
2	shared accommodation, afd, fled, draft bill, flat, germany, private, supply, social politics, threat	accomodation
3	shared accommodation, border check, reception centre, university, removal, fled, violence, commission of inquiry, country of origin, asylum application	Arrival of refugees
4	shared accommodation, euro, million, supplemental budget, draft bill, force, flat, fled, federal state, budget	costs for accomodation
5	private, minister, problem, unaccompanied, housing space, motion for a resolution, underage, feel happy for, ending, general agreement	agreement on accomodation for underaged without parents

Table 4b: Topics in speeches: Greens in BB

As depicted in Table 4a, only topic four addressed by AfD legislators in BB is related to immigration. The other topics on their side deal with state politics, international relations and the prime minister of the state Baden-Württemberg, Winfried Kretschmann, who represents the Greens. Consequently, there is evidence to conclude that AfD legislators in BB aim to increase the salience of the issue immigration as defined above. On the contrary, all topics addressed by the Greens in BB deal with immigration. Due to the evidence found, Hypothesis 1 is confirmed for BB.

In the following, I examine Hypothesis 2 for each state, similar to the previous analysis. Therefore, the topics addressed in sentences containing the issue immigration are considered. The description contains a frame as outlined by Benson (2013) and Mendelsohn et al. (2021) or, if those frames are not applicable, a summary of the topic as in the prior step.

For SN, the topics addressed by AfD legislators and Green legislators, respectively, in sentences comprising the issue immigration are as follows:

[9]Winfried Kretschmann: prime minister of Baden-Württemberg, Green

No.	Words	Description
1	applicant for asylum, must, refugee, saxony, more, year, germany, million, asylum, euro	Threat: Fiscal
2	european, agenda for migration, applicant for asylum, already, together, politics on asylum, enumerate, system of asylum, new, policy for immigration	Threat: Public Order
3	asylum, applicant for asylum, euro, million, european, must, refugee, county, already, agenda for immigration	Threat: Fiscal
4	asylum law, million, euro, applicant for asylum, go, germany, county, european, know, AfD	Threat: Fiscal
5	asylum law, go, know, requesting asylum, AfD, asylum, stand, time, therefore, abandon	Threat: Public Order

Table 5a: Topics in sentences: AfD in SN

No.	Words	Description
1	refugee, go, topic, integration, request, asylum, seeking for asylum, saxony, assault, fled	Victim: Discrimination
2	motivated, political, accommodation for asylees, crime, right-wing mentioned, case, capture, arson, refugee	Victim: Discrimination
3	refugee, topic, accommodation for refugees, assault, asylum, integration, at, fled, go, debate	Victim: Discrimination
4	accommodation for refugees, refugee, assault, all around germany, go, request, society, accommodate, reject, demand	Victim: Discrimination
5	request, organization for immigrants, placement, topic, fled, stand, assault, child, youths, immigration background	Victim: Discrimination

Table 5b: Topics in sentences: Greens in SN

Table 5a indicates that AfD legislators in SN focus on topics framing immigrants as a threat in line with the framework employed by Benson (2013) and Mendelsohn et al. (2021) within sentences dealing with immigration in their speeches. Topics one, three and four are about costs immigration entails. Moreover, topics two and five imply that asylum law has altered due to the waves of immigrants at that time. On the contrary, topics addressed by Green legislators in SN suggest that they consider immigrants as victims of crime. This pattern prevails in all five topics. Consequently, Hypothesis 2 can be confirmed for SN, implying that there is polarization based on the different frames of immigration.

Next, sentences by each AfD and Green legislators in TH are analyzed:

No.	Words	Description
1	immigration, consumer protection, justice, minister, launiger, applicant for asylum, year, committee, million, euro	Threat: Fiscal
2	year, applicant for asylum, consumer protection, justice, immigration, minister, million, euro, launiger, more	Threat: Fiscal
3	euro, year, million, refugee, per, politics on asylum, must, certainly, say, asylum	Threat: Fiscal
4	applicant for asylum, euro, million, placement, year, accommodate, state, child, fair, field of asylum	Threat: Fiscal
5	year, applicant for asylum, euro, placement, germany, last, number, per cent, refugee, accommodate	Numbers on refugees

Table 6a: Topics in sentences: AfD in TH

No.	Words	Description
1	seeking for asylum, refugee, must, thuringia, human, accommodation for refugees, fled, state, secure, attack	Victim: Discrimination
2	seeking for asylum, accommodation for refugees, refugee, attack, must, act of violence, human, state, right-wing, racist	Victim: Discrimination
3	cdu, committee, justice, consumer protection, immigration, draft bill, transfer, fiedler[10], request, must	legislative process
4	thuringia, seeking for asylum, attack, accommodation for refugees, act of violence, secure, local authority, year, so-called, country of origin	Victim: Discrimination
5	protection, task, thuringia, come, fled, human, always, grant, put, clear	protection for refugees

Table 6b: Topics in sentences: Greens in TH

According to Table 6a, AfD legislators talk about the costs of immigration in several contexts, e.g. consumer protection and accommodation. This hints at a framing of immigration as a threat. Only the last topic does not convey a frame in a sense that immigration can be considered a threat. Green legislators in TH frame immigrants as victims of discrimination in a sense that there is crime and violence against. This prevails in topics one, three and four. The last topic suggests that the state has to protect refugees, which strengthens this framing. Thus, the evidence suggests that Hypothesis 2 can be confirmed in TH.

Finally, sentences by each AfD and Green legislators in BB are examined:

No.	Words	Description
1	refugee, come, applicant for asylum, state, brandenburg, must, know, year, let, say	Refugees in Brandenburg
2	come, applicant for asylum, refugee, refugee crisis, let, fled, costs, brandenburg, year, always	Threat: Public Order Fiscal
3	refugee crisis, costs, overcoming, immigration crisis, applicant for asylum, enormous, challenge, come, know, asylum	Threat: Public Order Fiscal
4	seeking for asylum, fled, applicant for asylum, request, put in, human, come, legal status, asylum, let	Process of integration
5	politics on asylum, applicant for asylum, already, brandenburg, must, asylum application, reject, immigration, year, know	Administration of immigration

Table 7a: Topics in sentences: AfD in BB

No.	Words	Description
1	refugee, human, fled, brandenburg, state, integration, must, more, provide, good	Hero: Integration
2	integration, fled, human, immigrant, supply, more, request, refugee, always, state	More opportunities for integration
3	accommodation for refugees, integration, especially, attack, violence, political, supply, human, act of crime, fled	Victim: Discrimination
4	more, integration, immigrant, germany, state government, flat, federal state, moment, possible, say	More opportunities for integration
5	integration, state, under aged, unaccompanied, secure, must, more, fled, immigrant, really	immigration of under aged

Table 7b: Topics in sentences: Greens in BB

Topics two and three within Table 7a show that AfD legislators in BB consider the situation at that time as a crisis, which hints at a framing of a threat for the public order, in line with Benson (2013) and Mendelsohn

[10]Wolfgang Fiedler: state legislator in Thuringia, Christ Democrat (CDU)

et al. (2021). Besides, costs are also part of these two topics, suggesting a frame of a fiscal threat. This is in line with the findings for AfD legislators in the other two states. The other topics do not convey such a frame, though. Topics addressed by Green legislators in BB do not only suggest that the Greens consider immigrants as victims of violence as in the two prior cases, but also that immigrants integrate into society and that this process has to be enhanced. As a result, Hypothesis 2 can be confirmed for BB.

Summarizing the results of the two conducted steps to check for the hypotheses in each state, there is evidence that immigration is a polarized issue in all three considered states. Moreover, especially in TH and BB, AfD legislators address issues not directly related to immigration in speeches that contain the issue immigration. This hints at an attempt to increase the salience of the issue immigration as defined. Thus, AfD legislators politicize the issue immigration notably in TH and BB and to some extent in SN. This is in line with previous literature on politicization of immigration and on how right-wing parties.

6.5 Discussion

An increasing number of studies shows that right-wing parties have strengthened the politicization of the issue immigration in various countries (Grande et al., 2019, Lauwers et al., 2021, Gessler and Hunger, 2022 and Hutter and Kriesi, 2022). These articles employ a quantitative measure, i.e., the share of text dealing with immigration, to examine the salience of the issue immigration. Using speeches in three German state parliaments during the peak of the refugee crisis in Germany and this quantitative measure, I cannot confirm an increase of the salience of the issue immigration stemming from the speeches by the right-wing AfD. The shares of speeches comprising at least one word from the issue immigration do not differ much between AfD and Green legislators on state level. In case of TH, the share is even higher on the Green side.

There are two reasons why the quantitative criterion does not imply a stronger emphasis on the issue immigration on the AfD side compared to the Green side of each parliament. First, legislative sessions feature an agenda which provides a clear structure on issues to a large extent. Thus, there is few space for legislators to place issues arbitrarily in case those do not fit the agenda item. In contrast, parties are able to design manifestos, social media posts and press releases. These constitute the basis of most related studies, with very few restriction regarding content. Second, this study analyzes legislative speeches only within the peek of the refugee crisis, while other literature focuses on long periods of time and identifies peeks of salience. In the latter strand of literature, peeks with high salience of the issue immi-

gration are characterized by high shares of content related to immigration compared to times with low salience. Within the peeks, differences are not detected, as in this study. This study also suggests that in peek times, not only right-wing parties, but also cosmopolitan parties such as the Greens in Germany deal with the issue immigration with high intensity.

Quantitative measures do not suggest that AfD legislators politicized the issue immigration because of a lack of an increase in salience. This does not indicate that the data on legislative sessions does not provide evidence that the AfD politicized immigration. Instead of quantitative criteria, qualitative criteria newly introduced to the literature show that the AfD politicizes the issue immigration in the case of the legislative process.

AfD legislators address several issues which are not directly related to immigration in speeches comprising the issue immigration. These include state politics in general, democratic processes, international politics and relations and politics in other German states. This is evidence that AfD legislators attempt to connect immigration with other issues to increase its importance. Intuitively, AfD politicians suggest that immigration influences the other issues, the other way around or that both directions are valid. An exact analysis of the direction of the influence is not possible with NLP methods. The existence can be shown, though. On the contrary, Green legislators focus on immigration in their respective speeches. Some topics deal with integration, education and accommodation. These are important aspects of politics on immigration. This is a key difference to the topics found for AfD legislators. Intuitively, Green politicians focus on immigration and all its facets itself to optimize the work on this issue. As a contrast, AfD legislators put immigration and its effects in a much wider context. These findings provide abundant evidence to conclude that AfD legislators, contrarily to Green legislators, intentionally increase the salience of the issue immigration.

There is an alternative approach to explain the prevalence of issues not related to immigration in speeches held by AfD politicians. While the agenda of state legislative session is structured, there are also some general agenda items at which representatives discuss general or major issues. Following the results, this could imply that the AfD places the issue immigration into the set of important issues they address in this agenda item. This does not require any direct connection between these issues. This explanation does not hurt the conclusion that AfD legislators increase salience while Greens do not do so, though. The explanation from the previous paragraph assumes that the increased salience of immigration stems from the interaction between immigration and various other issues. The approach in this paragraph suggests that an increase in salience of immigration is depicted by addressing this issue in agenda items dedicated to major issues. In other

words, the first explanation is based on an indirect increase of salience while the latter explanation rests on a direct increase of salience. Importantly, neither approach suggests an intended increase of salience by Green legislators. Distinguishing between the two approaches is not possible with the method used in this article but is an interesting avenue for future literature on this matter.

The outcomes on salience are in line with the expectations depicted in Hypothesis 1. Literature on the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) and on the issue entrepreneurship theory (e.g. Hobolt and de Vries, 2015 and Buisseret and van Weelden, 2020) suggests that the AfD, a relatively new party at that time, had an interest in increasing the salience of immigration. This study adds evidence of these theories from the legislative process with a qualitative measure for salience. Moreover, the concept of issue ownership provides another explanation why the AfD had an incentive to increase the salience of the issue immigration. Several studies find that the AfD took the ownership of this issue during the time span considered in this article (Arzheimer and Berning, 2019 and Franzmann, 2019). The finding that the AfD linked the issue immigration with other issues may be interpreted as evidence of the process of taking the ownership. If the links between the issue immigration and other issues seem sensible for the electorate, this will be an indicator for the competence of the AfD regarding immigration.

Recent literature on the relation between the salience of an arbitrary issue within an electorate and political elites suggests that an increase of salience of an arbitrary issue within the electorate causes changes in politicians' communication (Helbling and Tresch, 2011, Wagner and Meyer, 2014, Klüver and Sagarzazu, 2016, Stier et al., 2018 and Dennison and Geddes, 2019). The results from this study can be interpreted as an example for this pattern. As outlined in section 2, the refugee crisis reached its peek during the time span considered with a large share of the electorate shaping opinions on this issue (Jesse, 2018 and Niedermayer, 2018). Combining with the (neo-)cleavage theory and the issue entrepreneurship theory, the AfD could have been incentivized to change the communication in legislative sessions to increase the salience of immigration. The incentive also applies to the political arena.

Additionally, the results support the increasing role salience plays in theoretical models of electoral competition from political economy (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017). In such models, salience or the weight of the issue is treated as an exogenous parameter. It determines, e.g., how much an issue is focused in strategies. The evidence suggests that certain parties increase salience

of issues by themselves, though. Thus, this article suggests that modeling salience as a endogenous parameter is a more realistic assumption. This insight may enhance theoretical models from political economy.

The examination of sentences in which each AfD and Green legislators mention the issue immigration suggests that they frame immigration differently as expected in Hypothesis 2. This applies to each of the three states considered. Moreover, the framing used by AfD politicians suggests that immigration is a threat while the Greens frame immigrants as victims. The frame of a threat can be considered negative, whereas the victim framing is supportive towards immigrants. This is evidence that there is ideological polarization between the parties considered. The framework by Benson (2013) and Hovden and Mjelde (2019) provides several subcategories of the general frames victim, hero and threat. The framing hero only prevails for the Greens in BB in one topic. Most topics found are evidence of the subcategory "fiscal" in case of the AfD while most topics can be attributed to the subcategory "discrimination" on the Green side. Some other topics addressed by AfD legislators in SN and BB can be related to the subcategory "public order".

While the major categories of frames in the results are as expected, the low number of subcategories featured in the sentences requires some intuition. One reason behind the limited scope of subcategories may be the source of data. In state legislative sessions, daily and current political issues are discussed. Thus, the focus is on events and major concerns which matter at that time. In addition, the time each legislator possesses for each speech is limited. Both factors contribute to speeches that aim to convey as much important content as possible. Contrary to e.g. manifestos or press releases, there is not enough time to address developments or reasons behind events. Stating costs of immigration or violence against immigrants is much easier and more valuable in this regard than, e.g., explaining long-term effects of immigration or reasons behind immigration. Examples for subcategories depicting long-term effects in the framework by van der Brug et al. (2015) and Hovden and Mjelde (2019) are "jobs" or "worker", an example for a reason for integration is "global economy". Such subcategories should not be expected in speeches from state legislative sessions.

The time frame of the collected speeches and sentences accounts for another reason. As outlined in section two, it is the peek of the refugee crisis in Germany. At that time, large numbers of immigrants arrived. Consequently, long-term effects of immigration on, e.g., society, culture and economy could not be detected at that time. There should thus be a strong focus on the arrival and short-term accommodation of immigrants with all its effects. The topics of the first analysis support this expectation.

The results from this analysis are evidence that framing an arbitrary issue in different manners can engender polarization. Notably, the data consists of speeches and not of manifesto data. The latter contains much more information about policies. Consequently, the nature of polarization found in various other studies that focus on manifestos (e.g. Hutter and Grande, 2014 and Meyer and Rosenberger, 2015) is different to the nature of polarization in this article. Importantly, there are more opportunities to polarize by employing framing, e.g. in social media and in speeches, than by utilizing policies. Therefore, the study therefore reinforces the growing body of contemporary literature that researches the role of framing in politics (e.g. Slothuus and de Vreese, 2010, Elias et al., 2015 and Vliegenhart et al., 2016).

The results show that legislative sessions as a data source as well as qualitative measures of salience and polarization are worthwhile alternatives to approaches in related literature. Similar research questions could be examined with focus on centre-right parties (inspired by earlier findings by e.g. Green-Pedersen and Krogstrup, 2008, Meyer and Rosenberger, 2015 and van der Brug et al., 2015) or on changes over time, e.g. before and after a tipping point in the course of a crisis. Notice that, data sets from state legislative sessions are not very large compared to long-term manifesto data. Yet, they are relatively easy to collect completely and can show short-term effects well because parliamentary sessions are frequent and deal with current issues.

Using a quantitative measure for salience did not reveal the results expected in Hypothesis 1. On the contrary, a newly introduced qualitative measure uncovered that the salience of the issue immigration was rather increased by AfD legislators than by Green legislators. This is evidence that salience should not only be considered a quantitative characteristic, but also a qualitative one.

Finally, the results show that AfD legislators in SN did not politicize immigration as much as their colleagues in TH and BB due to lower increases in salience. The purely quantitative measure also suggests that salience was higher in TH and BB compared to SN. This is depicted by a lower share of speeches dealing with immigration from both parties in SN. This implies that the context matters for the investigation of politicization. Importantly, certain local events may have a strong effect. The topics provide several clues that local events are addressed. Examples include demonstrations and crime against accommodations for refugees.

6.6 Conclusion

This study presents how the right-wing AfD politicized the issue immigration during the peek of the refugee crisis in Germany. Using state legislative speeches from three state parliaments as a basis, it employs a new type of data source within the corresponding literature. Moreover, it builds on the definition of an politicized political issue by van der Brug et al. (2015), who assume that an issue is politicized if and only if it is both salient and polarized. Salience and polarization are measured qualitatively and using NLP, contrary to related literature. Immigration is salient if speeches covering immigration also contain other political issues. Employing frame categories as introduced by Benson (2013) and Hovden and Mjelde (2019), topic modeling applied on the sentences containing the issue immigration can detect different frames across parties and thus polarization. The results show that the AfD politicized the issue immigration as expected in all states considered, especially in Thuringia and Brandenburg. AfD legislators, contrarily to Green legislators, raised the salience of immigration connecting it with various other political issues. Moreover, AfD politicians frame immigrants as a threat while Greens employ a victim frame, suggesting strong polarization.

With its results and approach, the study contributes to the strand of literature finding that right-wing populist drive the politicization of immigration. This is accomplished with novel criteria to measure salience and polarization, though. The is key to detect an increase of salience induced by the AfD qualitatively since the shares of speeches dealing with polarization do not differ much between the Greens and the AfD.

Besides its new features to the literature on politicization of immigration, the study contributes to and reinforces other related work as well. The results are in support of both the (neo-)cleavage theory (e.g. Kriesi et al., 2012 and Hooghe and Marks, 2018) and the issue entrepreneurship theory (e.g. Hobolt and de Vries, 2015 and Buisseret and van Weelden, 2020). Moreover, it shows how parties can influence the salience of issues. This is a key finding for recent theoretical work on electoral competition comprising the salience of issues (e.g. Krasa and Polborn, 2010, Krasa and Polborn, 2014 and Matakos and Xefteris, 2017).

Finally, the approach employed in this article opens up plenty of room for further studies on the politicization of issues. Future research may e.g. focus on short-term effects, which are by the nature of parliamentary sessions a good field. Moreover, differences in the degree of politicization between an arbitrary party across states can be examined. Additionally, it can be a valuable to consider what issues parties associate with a given arbitrary issue.

Acknowledgments

I am thankful to the participants of the 2023 Meeting of the European Public Choice Society.

Appendix

The following table depicts frames of immigration as identified by Benson (2013) and Hovden and Mjelde (2019) and presented by Mendelsohn et al. (2021):

Frame	Description
Victim: Global Economy	Immigrants are victims of global poverty, underdevelopment and inequality
Victim: Humanitarian	Immigrants experience economic, social, and political suffering and hardships
Victim: War	Focus on war and violent conflict as reason for immigration
Victim: Discrimination	Immigrants are victims of racism, xenophobia, and religion-based discrimination
Hero: Cultural Diversity	Highlights positive aspects of differences that immigrants bring to society
Hero: Integration	Immigrants successfully adapt and fit into their host society
Hero: Worker	Immigrants contribute to economic prosperity and are an important source of labor
Threat: Jobs	Immigrants take nonimmigrants' jobs or lower their wages
Threat: Public Order	Immigrants threaten public safety by being breaking the law or spreading disease
Threat: Fiscal	Immigrants abuse social service programs and are a burden on resources
Threat: National Cohesion	Immigrants' cultural differences are a threat to national unity and social harmony

Table 8: Frames of immigration

The following pictures show the topics of speeches used for the examination of Hypothesis 1 in German. Notice that the first number stands for the number of all speeches, while the second number depicts the number of speeches containing at least one word of the issue immigration.

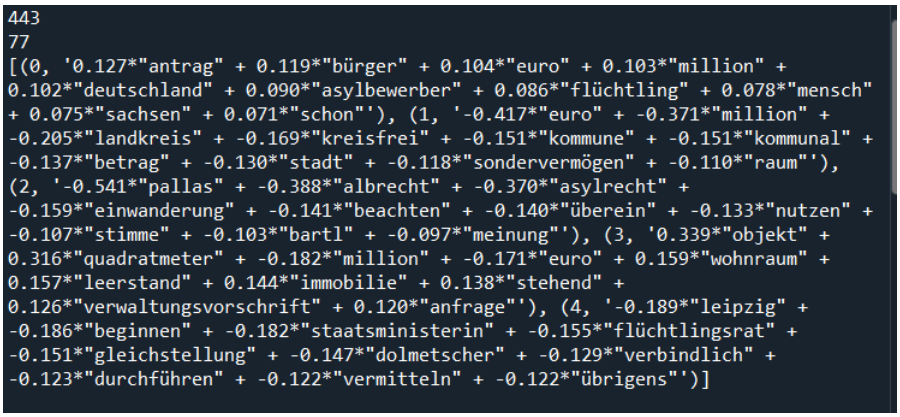


Figure 1a: Topics in speeches in German: AfD in SN

Figure 1a Alt Text: This image shows that AfD legislators held in total 443 speeches in the state parliament of Saxony from August 10, 2015 to March 31, 2016. 77 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: antrag, bürger, euro, million, deutschland, asylbewerber, flüchtling, mensch, sachsen, schon
2: euro, million, landkreis, kreisfrei, kommune, kommunal, betrag, stadt, sondervermögen, raum
3: pallas, albrecht, asylrecht, einwanderung, beachten, überein, nutzen,

stimme, bartl, meinung
4: objekt, quadratmeter, million, euro, wohnraum, leerstand, immobilie, stehend, verwaltungsvorschrift, anfrage
5: leipzig, beginnen, staatsministerin, flüchtlingsrat, gleichstellung, dolmetscher, verbindlich, durchführen, vermitteln, übrigens

Figure 1b: Topics in speeches in German: Greens in SN

Figure 1b Alt Text: This image shows that Green legislators held in total 298 speeches in the state parliament of Saxony from August 10, 2015 to March 31, 2016. 49 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: antrag, sachsen, mensch, integration, gemeinde, afd, politisch, stadt, fraktion, tillich
2: rechtsstaat, gemeinde, tillich, landkreis, integration, heidenau, stadt, gewaltmonopol, gewalt, wert
3: gemeinde, stadt, landkreis, jüdisch, migrantenorganisation, staatsministerin, ungarn, afd, europäisch, landesmigrantenorganisation
4: schule, jugendliche, kind, rechtsstaat, ressource, politik, integration, ungarn, migrationshintergrund, schüler
5: anhörung, ungarn, gemeinde, sicherheit, gesetzentwurf, rechtsstaat, koalition, fußballspielen, afd, jüdisch

Figure 2a: Topics in speeches in German: AfD in TH

Figure 2a Alt Text: This image shows that AfD legislators held in total 409 speeches in the state parliament of Thuringia from August 10, 2015 to March 31, 2016. 104 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: euro, kommune, asylbewerber, gesetzentwurf, landesregierung, demokratie, million, thüringer, schule natürlich
2: mediumeninformation, organisator, verbraucherschutz, justiz, migration, launiger, minister, biedermänner, fremdenfeindlich, demonstration
3: demokratie, volksentscheid, abstimmung, bürgerbegehren, volk, direkt, euro, grundgesetz, mediumeninformation, bürger
4: kommune, schüler, euro, sportverein, schule, lehrer, million, turnhalle, kommunal, gebietsreform
5: sportverein, schule, europa, turnhalle, kommune, eu, schüler, demokratie, sport, anerkennungsquote

Figure 2b: Topics in speeches in German: Greens in TH

Figure 2b Alt Text: This image shows that Green legislators held in total 79 speeches in the state parliament of Thuringia from August 10, 2015 to March 31, 2016. 22 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: euro, flüchtling, million, mensch, tag, verfügung, schule, cdu, antrag, kommend
2: anhörung, gesetzentwurf, mündlich, sport, jugend, zusatzfrage, drucksache, abgeordnet, ausschuß, sitzung
3: erwachsenenbildung, passen, euro, million, tag, münchen, stärken, flüchtling, vielleicht, träger
4: drucksache, zusatzfrage, abgeordnet, wärmedämmung, mündlich, flüchtlingsunterkunft, anfrage, staatssekretär, götz, übergriff
5: landkreis, flüchtlingsintegration, schulsozialarbeiterinnen, schulbezogen, erwachsenenbildung, tag, schulsozialarbeiter, gebietskörperschaft, jugendsozialarbeit, träger

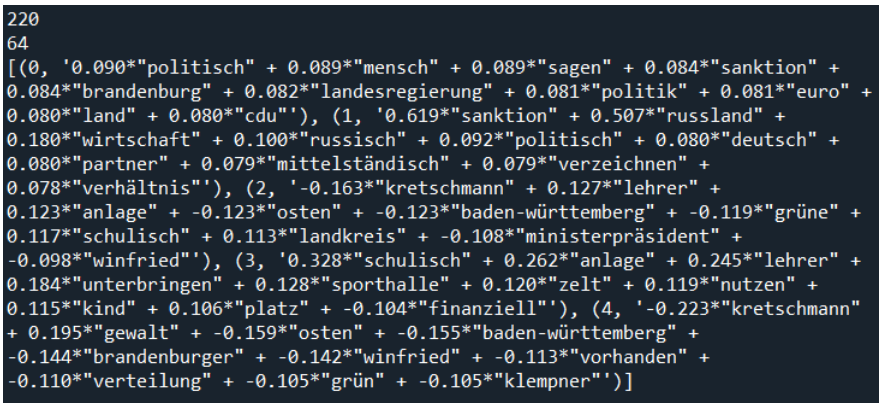


Figure 3a: Topics in speeches in German: AfD in BB

Figure 3a Alt Text: This image shows that AfD legislators held in total 220 speeches in the state parliament of Brandenburg from August 10, 2015 to March 31, 2016. 64 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: politisch, mensch, sagen, sanktion, brandenburg, landesregierung, politik, euro, land, cdu
2: sanktion, russland, wirtschaft, russisch, politisch, deutsch, partner, mittelständisch, verzeichnen, verhältnis
3: kretschmann, lerher, anlage, osten, baden-württemberg, grüne, schulisch, landkreis, ministerpräsident, winfried
4: schulisch, anlage, lehrer, unterbringen, sporthalle, zelt, nutzen, kind, platz, finanziell
5: kretschmann, gewalt, osten, baden-württemberg, brandenburger, winfried, vorhanden, verteilung, grün, klempner

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194
48
[(0, '-0.095*"integration" + -0.094*"gemeinschaftsunterkunft" + -0.091*"land" +
-0.084*"euro" + -0.084*"gut" + -0.084*"geflüchtet" + -0.082*"million" +
-0.079*"mensch" + -0.078*"antrag" + -0.076*"brandenburg"'), (1,
'-0.171*"gemeinschaftsunterkunft" + 0.169*"afd" + -0.136*"geflüchtet" +
-0.133*"gesetzentwurf" + -0.125*"wohnung" + 0.115*"deutschland" +
-0.109*"privat" + -0.102*"versorgung" + 0.100*"sozialpolitik" +
0.100*"bedrohung"'), (2, '0.134*"gemeinschaftsunterkunft" +
0.128*"grenzkontrolle" + 0.127*"erstaufnahmeeinrichtung" + -0.117*"hochschule" +
0.100*"abschiebung" + 0.097*"geflüchtet" + 0.094*"gewalt" +
-0.091*"enquetekommission" + 0.086*"herkunftsstaat" + 0.085*"asylverfahren"'),
(3, '-0.193*"gemeinschaftsunterkunft" + 0.168*"euro" + 0.138*"million" +
0.137*"nachtragshaushalt" + -0.133*"gesetzentwurf" + -0.129*"gewalt" +
-0.126*"wohnung" + -0.118*"geflüchtet" + 0.100*"bund" + 0.096*"haushalt"'), (4,
'-0.215*"privat" + -0.119*"ministerin" + -0.114*"problem" + 0.114*"unbegleitet"
+ -0.109*"wohnraum" + 0.101*"entschließungsantrag" + 0.099*"minderjährig" +
0.095*"freuen" + 0.091*"punkt" + -0.088*"rahmenvereinbarung"')]
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Figure 3b: Topics in speeches in German: Greens in BB

Figure 3b Alt Text: This image shows that Green legislators held in total 194 speeches in the state parliament of Brandenburg from August 10, 2015 to March 31, 2016. 48 of these speeches dealt with the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the speeches dealing with immigration. The topics include the following words:
1: integration, gemeinschaftsunterkunft, land, euro, gut, geflüchtet, million, mensch, antrag, brandenburg
2: gemeinschaftsunterkunft, afd, geflüchtet, gesetzentwurf, wohnung, deutschland, privat, versorgung, sozialpolitik, bedrohung
3: gemeinschaftsunterkunft, grenzkontrolle, erstaufnahmeeinrichtung, hochschule, abschiebung, geflüchtet, gewalt, enquetekommission, herkunftsstaat, asylverfahren
4: gemeinschaftsunterkunft, euro, million, nachtragshaushalt, gesetzentwurf,

gewalt, wohnung, geflüchtet, bund, haushalt
5: privat, ministerin, problem, unbegleitet, wohnraum, entschließungsantrag, minderjährig, freuen, punkt, rahmenvereinbarung

The following pictures show the topics of sentences used for the examination of Hypothesis 2 in German. Notice that the first number stands for the number of all speeches, the second number depicts the number of speeches containing at least one word of the issue immigration and the third number embodies the number of sentences comprising at least one word of the issue immigration.

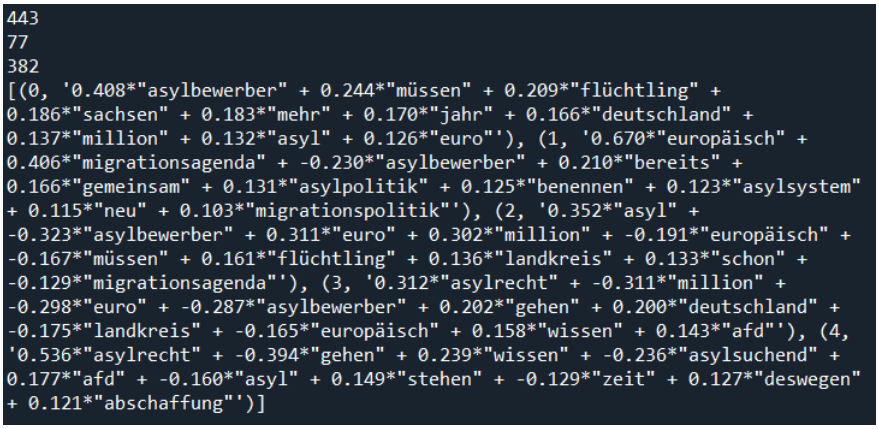

Figure 4a: Topics in sentences in German: AfD in SN

Figure 4a Alt Text: This image shows that AfD legislators held in total 443 speeches in the state parliament of Saxony from August 10, 2015 to March 31, 2016. 77 of these speeches dealt with the issue immigration. 382 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: asylbewerber, müssen, flüchtling, sachsen, mehr, jahr, deutschland, million, asyl, euro
2: europäisch, migrationsagenda, asylbewerber, bereits, gemeinsam, asylpolitik, benennen, asylsystem, neu, migrationspolitik
3: asyl, asylbewerber, euro, million, europäisch, müssen, flüchtling, landkreis, schon, migrationsagenda
4: asylrecht, million, euro, asylbewerber, gehen, deutschland, landkreis, europäisch, wissen, afd
5: asylrecht, gehen, wissen, asylsuchend, afd, asyl, stehen, zeit, deswegen, abschaffung

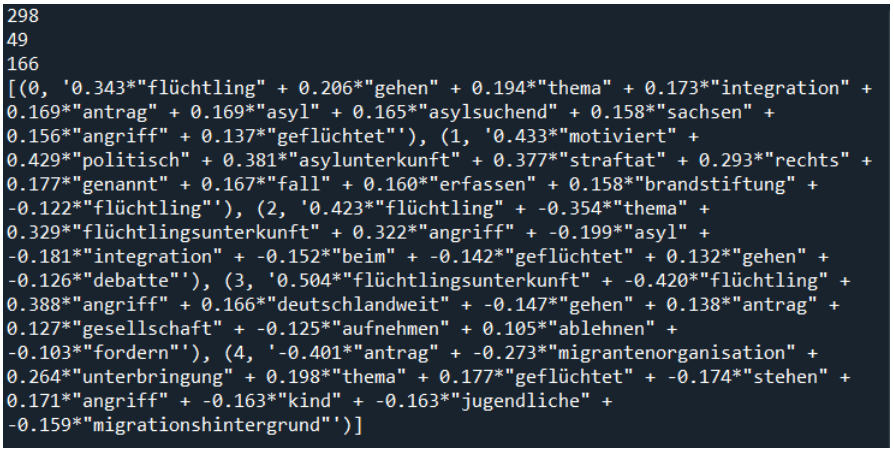

Figure 4b: Topics in sentences in German: Greens in SN

Figure 4b Alt Text: This image shows that Green legislators held in total 298 speeches in the state parliament of Saxony from August 10, 2015 to March 31, 2016. 49 of these speeches dealt with the issue immigration. 166 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: flüchtling, gehen, thema, integration, antrag, asyl, asylsuchend, sachsen, angriff, geflüchtet
2: motiviert, politisch, asylunterkunft, straftat, rechts, genannt, fall, erfassen, brandstiftung, flüchtling
3: flüchtling, thema, flüchtlingsunterkunft, angriff, asyl, integration, beim, geflüchtet, gehen, debatte
4: flüchtlingsunterkunft, flüchtling, angriff, deutschlandweit, gehen, antrag, gesellschaft, aufnehmen, ablehnen, fordern
5: antrag, migrantenorganisation, unterbringung, thema, geflüchtet, stehen, angriff, kind, jugendliche, migrationshintergrund

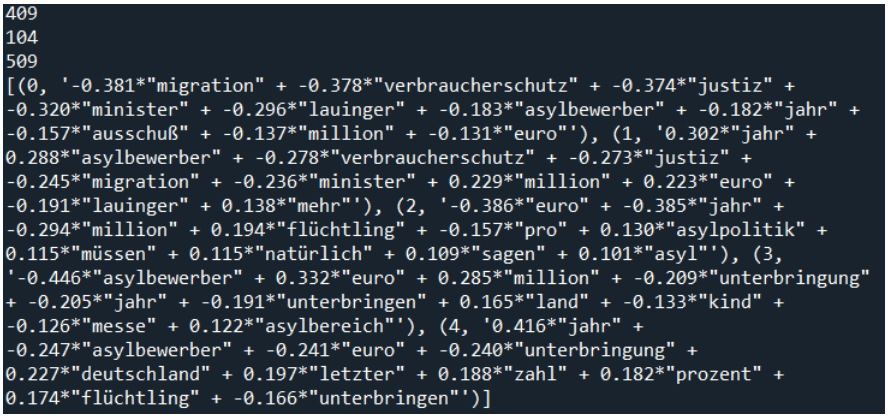

Figure 5a: Topics in sentences in German: AfD in TH

Figure 5a Alt Text: This image shows that AfD legislators held in total 409 speeches in the state parliament of Thuringia from August 10, 2015 to March 31, 2016. 104 of these speeches dealt with the issue immigration. 509 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: migration, verbraucherschutz, justiz, minister, launiger, asylbewerber, jahr, ausschuß, million, euro
2: jahr, asylbewerber, verbraucherschutz, justiz, migration, minister, million, euro, launiger, mehr
3: euro, jahr, million, flüchtling, pro, asylpolitik, müssen, natürlich, sagen, asyl
4: asylbewerber, euro, million, unterbringung, jahr, unterbringen, land, kind, messe, asylbereich
5: jahr, asylbewerber, euro, unterbringung, deutschland, letzter, zahl, prozent, flüchtling, unterbringen

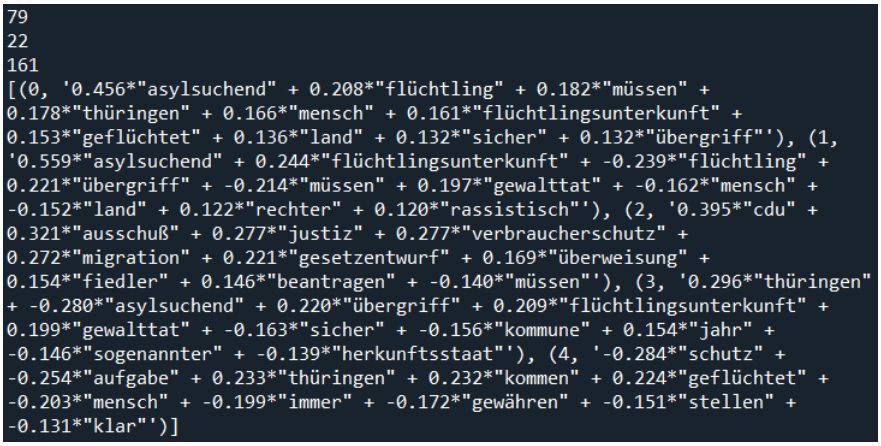

Figure 5b: Topics in sentences in German: Greens in TH

Figure 5b Alt Text: This image shows that Green legislators held in total 79 speeches in the state parliament of Thuringia from August 10, 2015 to March 31, 2016. 22 of these speeches dealt with the issue immigration. 161 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: asylsuchend, flüchtling, müssen, thüringen, mensch, flüchtlingsunterkunft, geflüchtet, land, sicher, übergriff
2: asylsuchend, flüchtlingsunterkunft, flüchtling, übergriff, müssen, gewalttat, mensch, land, rechter, rassistisch
3: cdu, ausschuß, justiz, verbraucherschutz, migration, gesetzentwurf, überweisung, fiedler, beantragen, müssen
4: thüringen, asylsuchend, übergriff, flüchtlingsunterkunft, gewalttat, sicher, kommune, jahr, sogenannter, herkunftsstaat
5: schutz, aufgabe, thüringen, kommen, geflüchtet, mensch, immer, gewähren, stellen, klar

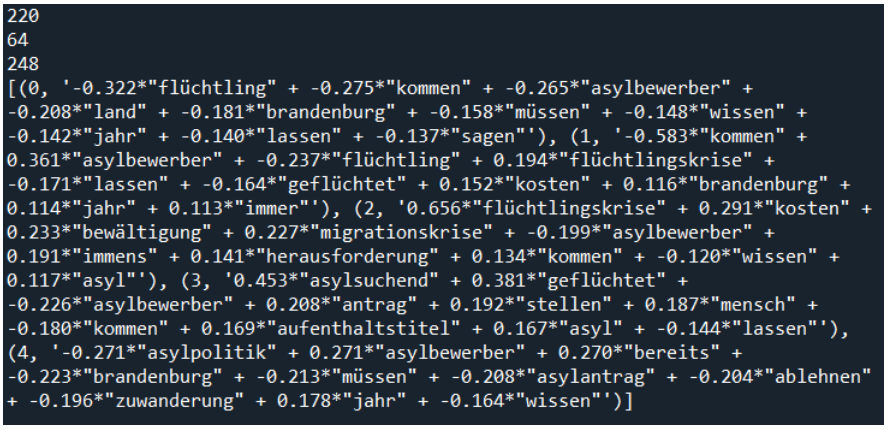

Figure 6a: Topics in sentences in German: AfD in BB

Figure 6a Alt Text: This image shows that Green legislators held in total 220 speeches in the state parliament of Brandenburg from August 10, 2015 to March 31, 2016. 64 of these speeches dealt with the issue immigration. 248 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: flüchtling, kommen, asylbewerber, land, brandenburg, müssen, wissen, jahr, lassen, sagen
2: kommen, asylbewerber, flüchtling, flüchtlingskrise, lassen, geflüchtet, kosten, brandenburg, jahr, immer
3: flüchtlingskrise, kosten, bewältigung, migrationskrise, asylbewerber, immens, herausforderung, kommen, wissen, asyl
4: asylsuchend, geflüchtet, asylbewerber, antrag, stellen, mensch, kommen, aufenthaltstitel, asyl, lassen
5: asylpolitik, asylbewerber, bereits, brandenburg, müssen, asylantrag, ablehnen, zuwanderung, jahr, wissen

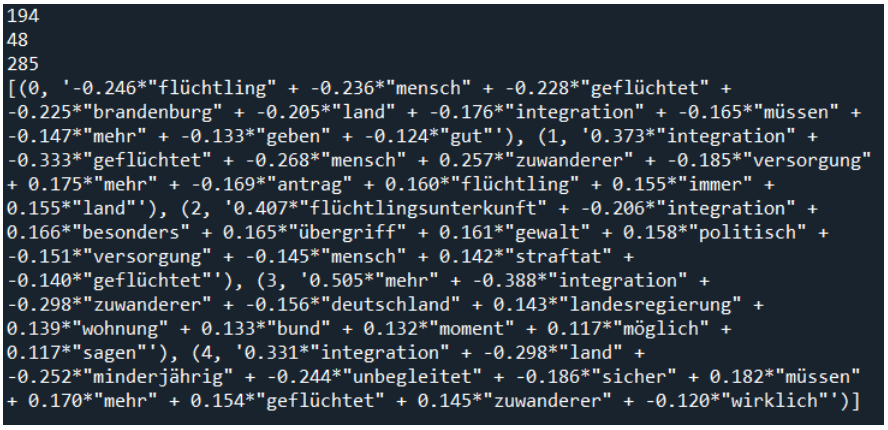

Figure 6b: Topics in sentences in German: Greens in BB

Figure 6b Alt Text: This image shows that Green legislators held in total 194 speeches in the state parliament of Brandenburg from August 10, 2015 to March 31, 2016. 48 of these speeches dealt with the issue immigration. 285 sentences within these speeches include the issue immigration. The image depicts the five topics revealed by LSI models used to analyze the sentences dealing with immigration. The topics include the following words:
1: flüchtling, mensch, geflüchtet, brandenburg, land, integration, müssen, mehr, geben, gut
2: integration, geflüchtet, mensch, zuwanderer, versorgung, mehr, antrag, flüchtling, immer, land
3: flüchtlingsunterkunft, integration, besonders, übergriff, gewalt, politisch, versorgung, mensch, straftat, geflüchtet
4: mehr, integration, zuwanderer, deutschland, landesregierung, wohnung, bund, moment, möglich, sagen
5: integration, land, minderjährig, unbegleitet, sicher, müssen, mehr, geflüchtet, zuwanderer, wirklich

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