ERASMUS UNIVERSITEIT ROTTERDAM

Brussels' Gucci Gulch

Examining the density of corporate interest group populations in the EU

Master Thesis

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Date: 27.06.2022

Word Count: 19,946

Summary

Over the past decades, studies on interest groups in the EU have increased noticeably. However, the available literature focusses mainly on the micro-level, which examines individual groups. Research into the systems of interest groups, so-called populations, at the macro-level remains underrepresented. A variety of theories, originating from the US, explain differences in the development of interest group populations. The Population Ecology Theory of Lowery and Gray is the most prominent example in contemporary political science, often applied through the cross-sectional ESA model. While its application to the EU has been limited by fragmented data sources, the Transparency Register now offers an opportunity to conduct a comprehensive large-n study. The present paper utilizes this possibility to identify variables that facilitate the mobilization of corporate interest groups and shape the density of their populations. For this purpose, an adapted ESA model tests five hypotheses. Results highlight the importance of two different variables. First, the density of corporate interest group populations increases with higher constituency, operationalized by annual turnover. This relationship is limited by density dependence, proving that populations only increase to a certain point until competition among similar interest groups limits further growth. It further shows that the EU interest group system has reached a point of maturity, which was not verifiable a decade ago. The second variable that has a significant relationship with density is policy participation. Having more expert groups to participate in the policy-making process, brings more interest groups to Brussels. Further explorative findings highlight the differences between corporate and social interest groups. It becomes evident that their mobilization processes vary substantially and can therefore not be explained by the same approaches. Future research can link the gained knowledge with micro-level studies, focus more on the mobilization of social interest groups and further specify the independent variables of the ESA model.

Acknowledgement

This master thesis marks the end of my academic career for the time being and gives reason to look back with sincere gratitude. The path towards this work would have not been possible without the support of countless people. I would like to thank my parents and grandparents for their continuous love and support on every step along the way. Your presence made all the difference and I dedicate this work to you. Beyond that, I am thankful for all the friends I made in various occasions over the past years. My personal development is owed to every single one of you.

Looking back on the last year in the IMP programme, I want to thank all the people that have been working closest with me. First and foremost, thank you to Professor Haverland for his work in class and his patient support in creating this thesis. I want to thank Dr. Zhelyazkova for her efforts and expertise as my second reader. Further specific academic support was given by Dr. Berkhout from the University of Amsterdam, which I highly appreciate. I am also grateful for my thesis circle of Elena, Christine, and Laurens. Their regular feedback helped to overcome many hurdles along the way. Having the combined support of supervisors, thesis circle, and guidelines helped to achieve a work of high academic standards. Furthermore, I want to take the opportunity and thank some people specifically who made the last year special. Thank you to Chris for being my best friend during this master. Thank you to Katha, Elsa, and Theresa for taking your time and giving me input to think outside the box. Thank you to Niklas for getting me into a working mode. Thank you to Fritzi for providing needed distraction from studying. Thank you to my roommates for enduring my late night studying with loud music. Thank you to Romy for helping me to overcome the lockdown and even my Covid infection. I hope this master thesis can live up to all my gratitude and reflect on the personal development that I have achieved.

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List of Abbreviations

Abbreviation	Meaning
CONECCS	Consultation, the European Commission and Civil Society
EESC	European Economic and Social Committee
ESA	Energy, Stability, Area
EU	European Union
ISIC	International Standard Industrial Classification
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical Classification of Economic Activities in the European Community)
OLS	Ordinary least squares

1 Introduction

Gucci Gulch may sound like the name of a faraway canyon populated by exotic animals; rather, it is derived from the gathering of luxury shoes in the United States (US) Senate (Politico, 2013). These are found on the feet of people that roam around the corridors without holding a public office: lobbyists. Though lobbyists may not be exotic animals, the comparison between biology and their organisation in interest groups is less incongruous than it first appears. Academic research that studies lobbyists resemble noticeable similarities with biology. Animals can either be studied by dissecting the individuals (de Villiers & Monk, 2005) or by examining their population in a certain habitat (Rosenzweig & Winakur, 1969). The same applies to interest groups, where the research can be similarly split into two categories: micro- and macro-level studies (Hanegraaff et al., 2020).

Micro-level studies are proverbially dissecting individual interest groups, examining differences in their strategies and lobbying results. Differences are mostly described by factors like the amount of money spent, issue topics, and the policy venue (Bouwen, 2004). Studies engaging with these factors can generally be assigned to the micro-level, which represents the dominant lens to examine interest groups in contemporary political science (Nownes, 2010). Macro-level studies on the other hand aim to explain the system of interest groups, also known as population. While animal populations are defined in terms of genetic commonality, organizational populations must have a unitary character that holds shared dependence on the environment (Hannan & Freeman, 1988). If the environment changes, its members are affected similarly. According to Hanegraaff et al. (2020) findings of macro-level studies provide implication for the representation, policy making, and social stability. Compared to its counterpart, macro-level studies remain less prominent in interest group literature (Nownes, 2010).

Early research on the macro-level focussed on external mobilization factors as the driving force behind the formation of groups. Disturbance Theory expects that individuals are inclined to engage in interest groups when their interests are threatened by disturbances (Truman, 1951). Succeeding theories proposed that interest groups and their entrepreneurs must offer incentives for people to join (Olson, 1965; Salisbury, 1969). The present paper will however focus on the Population Ecology Theory (Lowery & Gray, 1995), which focusses on population characteristics as main cause for the mobilization and development of groups. Population ecology was originally proposed to understand biological populations, using competition and legitimacy to explain developments in their composition. The main characteristics are defined as density, which describes the number of interest groups, and diversity, which describes the range of involved actors (Chalmers, 2015). For the application to interest groups, the Population Ecology Theory can either be tested with time-series or cross-sectional designs (Lowery & Gray, 2015).

The underrepresentation of macro-level studies is matched by the heavily skewed proportion of political systems that are examined for interest group research. A majority of existing literature has been conducted in the US (Kanol, 2015). Prominent macro-level theories in the present paper (e.g., Lowery & Gray, 1995; Olson, 1965; Truman, 1951) have also been developed based on national and state interest groups in the US. The European Union (EU) and its interest groups have historically received less attention, once described as a “niche field of research” (Beyers et al., 2008, p. 1103). However, the literature saw an increase in the 21st century and impelled Bunea and Baumgartner (2014) to conduct a meta-analysis of 196 articles. This revealed that certain aspects of EU interest groups received more attention than others. The general focus was mainly on the relationship between interest groups and lobbying strategies, access, and forms of participation – namely micro-level studies. The authors recognised that this leads to lack of macro-level studies in the EU compared to the prevalent domains. Furthermore, Bunea and Baumgartner (2014) noticed that only 24% of the reviewed studies had a quantitative design. For these reasons, the authors highlighted the urge for more emphasis on the macro-level and increased quantitative designs.

Considering the general insufficiency of macro-level studies in interest group research, specifically in the EU, opens promising opportunities to tackle this issue in the present paper. One study that has covered both fields was conducted by Messer et al. (2011), where they applied the Energy, Stability, Area (ESA) Model to the EU. It was originally proposed by Lowery and Gray (1995) in the context of Population Ecology Theory and examines its three name-giving terms regarding their influence on population density. However, since the EU differs significantly in its political system to the US, the terms and operationalizations required fundamentally adaption for reasonable use (see chapter 2.3.2). There are two reasons why it is worth revisiting the application of the ESA Model in the EU. First, Messer et al. (2011) were only cautiously optimistic about their findings and implied that future research must further examine implications of different political systems. This includes the advancement of utilized operationalisations and an explicit focus on the relationship between corporate interests and the ESA model. Secondly, the time difference to 2011 means that data availability has substantially changed. While this prevents for a direct replication, as certain variables cannot be replicated, it is mainly beneficial as new data allows for updated conclusions. In this context, the introduction of the Transparency Register (European Commission, 2022a) is of particular value. It enables to consider more than 12,000 interest groups, whereas Messer et al. (2011) relied on a comparatively small sample of 168 groups.

Taking all this into consideration, the present paper enhances interest group research on various fronts. Not only is it possible to broaden the field of the macro-level approach and reduce the leading edge of research in the US, but new data availability allows to consolidate existing findings in the EU. To achieve these goals, existing findings (e.g., Berkhout et al., 2015; Messer et al., 2011) are

considered and under the availability of new data evolved into a contemporary adaption of the ESA Model. This approach can be summarized in the following research question, which reflects the general objective and guides through the upcoming chapters: *Which variables influence the density of corporate interest group populations in the EU?*

1.1 Theoretical Relevance

To examine whether the present paper and its research question can claim to have theoretical relevance, the guiding advice of Lehnert et al. (2007) is consulted. According to their requirements, academic works must provide a better theoretical and empirical understanding of a theory or concept. For this purpose, the new work must build on existing literature and explicitly tie its outcomes to previous research. The present paper fulfils this requirement as it stands in direct alignment with the legacy of macro-level theories of interest group research and the Population Ecology Theory (Lowery & Gray, 1995). Its theoretical value is given by this basis and additionally through the above-described gaps in the literature. Measuring population phenomena has generally been underexplored due to measurement issues (Gray & Lowery, 1994) and Bunea and Baumgartner (2014) have showed the resulting gaps on this field in the EU. Already existing results (e.g., Berkhout et al., 2015; Messer et al., 2011) is employed as reference to interpret findings of this study.

Furthermore, Lehnert et al. (2007) present eight possible venues to prove theoretical relevance, of which the present paper fits at least two. First is the application of a theory to a new empirical domain. While the EU interest group population is not an entirely new domain without any preceding research, its underrepresentation in the literature makes it a suitable case for this venue. A utilization of the Transparency Register (European Commission, 2022a) has also not taken place in Population Ecology Theory, which contributes additional knowledge to the research community. The second venue proposed by Lehnert et al. (2007) is the provision of alternative explanation through the integration of existing theories. Taking the ESA model as core of this research and considering the partially mixed findings of Messer et al. (2011) requires adaption in the variables, operationalisations and considered population. This progress results in an evolved and superior model than its predecessors. Due to the described compliance with Lehnert et al. (2007) and their requirements, theoretical relevance is assured for the present paper.

1.2 Societal Relevance

Assessing the presence of societal relevance continues to follow along the work of Lehnert et al. (2007). An academic work can claim it when people are affected by its topic. At the same time researchers must present an evaluation standard that can examine varying evaluations among affected people for possible outcomes of the issue. In the present case, the evaluation standard for differences in density is influence. Lowery & Gray (2015, p. 9) wrote: „Influence necessarily depends upon who is at the table,

what they want, and how they lobby, variables that (…) are profoundly influenced by the density (…) of lobbying communities”. Thus, the influence on policy making changes when levels of density vary. For example, higher density among interest groups that are invested in regional policies could shift the legislative focus from external trade to more local policies. Affected people of varying density are primarily public officials and interest groups themselves. Knowing which variables influence these variations will give public officials a better responsiveness to lobbying activities. Possibly, they could take measurements to increase influence of underrepresented groups by enhancing their density. Interest groups on the other hand can learn how differences in influence compared to other groups occur. They can derive strategies from the presented results to increase their own density, which would increase their own influence. Ultimately, the varying influence caused by density differences leads to changed policy outcomes in the EU. This affects all its citizens and therefore extends the relevance far out of Brussels. Chapter 7 will take all this into account and deliver practical recommendation for the affected actors to further increase the presence of societal relevance (Lehnert et al., 2007).

1.3 Thesis Guide

The following chapters will lead this thesis to find an answer for the presented research question. For this purpose, the broad definition of interest groups is going to be applied. Stated relevance is going to be equally considered along the process. Chapter two starts by conducting a literature review that gives an overview on addressed macro-level theories and corresponding studies. Based on the available literature, the theoretical framework is derived in chapter three. This includes theory-driven hypotheses and a further development of the ESA model to match the case of the EU. Subsequentially, chapter four describes choices for the research and operationalisations as well as an assessment of objectivity, reliability, and validity. Statistical results of the ESA model can be found in chapter five. The discussion in chapter six reflects on them in the context of existing studies to draw implications from the new state of research. Finally, chapter seven gives a final answer to the research question and presents recommendations, limitations, and advice for future research.

2 Literature Review

Scholars have been interested in mobilization processes since the early days of interest group research (Truman, 1951). In the beginning, characteristics of a populations were solely seen as results of external factors (Lowery & Gray, 2015). The dominating discourse put the focus on mobilization events that lead institutions and individuals to found or join interest groups (Truman, 1951; Olson, 1965; Salisbury, 1969). This changed in the mid-1990s with the *Population Ecology Theory*, exemplified and summarized by Gray and Lowery (1996). Shifting the focus towards internal characteristics of populations, the theory showed how they can influence adaption, strategies, tactics, and influence of interest groups. The following chapter provides an overview on the timeline of research in interest group mobilization

processes. Starting with Truman (1951), Olson (1965), Salisbury (1969) and presenting the Population Ecology Theory of Lowery and Gray (1995) in detail outlines underlying processes and present the current state of research.

2.1 Disturbance theory

As one of the first theories to examine the mobilization of interest groups, Truman (1951) assumed that interest groups arise from two interrelated processes. First, society is becoming increasingly complex through changing economy, technology, and mass communication. To meet the development and requisite skills in this complex environment, division of labour is expanding among industries, creating new groups with individual political interests. However, increasing complexity and the rise of diverse groups do not account for interest group mobilization alone. Disturbances on a societal level are the second process to give the impetus for organization and mobilization of lobbying activities. Generally, disturbances are expected to change the relationship between groups or individuals and others, altering the existing equilibrium. Organizing in interest groups gives a chance to stabilize new relationships and to create a new equilibrium that overcomes the disadvantageous forces of the preceding event. Truman (1951) does not present a specific definition of events for his disturbance concept. However, it is nowadays widely agreed that the concept is applicable for different forms in the entire spectrum of interest groups (Walker, 1983). Even the formation of an interest group itself can be a disturbance to opponents, creating a process of waves that mobilizes interest groups until an equilibrium is re-established.

Implications of disturbances on interest groups have been widely examined in academic literature, especially with major events in the US. LaPira (2014) utilized a data set of lobbying disclosure reports between 1998 and 2008 to examine lobbying activity and mobilization after the terrorist attacks of 9/11. Counted reports, mentioning homeland security as dependent variable, showed that existing interest groups shifted their attention and new groups opportunistically mobilized. Interestingly, mobilization in the field of homeland security did not increase directly after the terrorist attacks. The disturbance only took effect after 2002, once new bureaucratic conditions were institutionalized. LaPira (2014) credited Truman (1951) but saw the main explanation in large-scale attention shifts of the government, resulting in high demand for information. In another study, Chalmers (2015) focussed on the effects of the financial crisis in 2008. While it had generally diminished the number of financial interest groups, increased salience on specific regulations reversed this effect. Media coverage and announcements for negotiation processes influenced more diverse groups to engage in this issue. This ties with Halpin (2011), who showed that catalysers, such as media, civil servants, and campaign groups, can create cascades of mobilization, by highlighting certain policy issues. All these findings support the importance of key events or disturbances (Truman, 1951) for interest groups.

In European countries, Junk et al. (2021) examined the disturbance theory in the context of the Covid-19 pandemic. However, it was not researched whether Covid-19 increased the mobilization of interest groups, but rather their access to policymakers. Mailed questionnaires collected self-reported data for dependent and independent variables from multiple groups. The results found that interest groups, which were more affected by the pandemic, showed more frequent advocacy and had increased access across all venues. However, higher advocacy and mobilization only accounted partially for this outcome, since affected organizations even increased their access when holding lobbying intensity constant in the regression. The authors see the main explanatory factor in a controlled government response to affected businesses, leading to a demand-pull for input from policymakers. Yet, Junk et al. (2021) explicitly highlighted the importance of Truman’s (1951) disturbance theory for contemporary research of interest group mobilization.

Despite these presented takes on Truman (1951) from recent years, most research on disturbances was conducted in the late 20th century. In many studies it has been directly compared to the exchange theory of Salisbury’s (1969). The following chapter therefore gives an introduction into this theory, including its origins in the collective action theory (Olson, 1965). Subsequently, comparative studies and their findings are presented to examine implications of both theories for interest group mobilization.

2.2 Collective Action and Exchange Theory

Truman’s (1951) disturbance theory attracted frequent critiques from an early stage, with the Logic of Collective Action (Olson, 1965) as one of the most strident ones. It assumes that individuals are not inclined to act in collective endeavours when their interests are threatened by disturbances. The hurdle of mobilization is basically too high to offer sufficient incentives for the decision to enter. Instead, group formation is only made realistic if the group offers exclusive collective benefits to their members, including possible free riders. Entering the group must offer more benefits than the cost of staying outside.

Salisbury (1969) build on this with the Exchange Theory. In short, it postulates that the benefits of entering interpersonal relationships derive from the exchange with each other. It broadens Olson’s (1965) theory to two forms of non-material benefits. The first is solidary benefits, which are based on opportunities to meet people in the group to form friendship and gain status. Second are purposive benefits, describing the satisfaction that members receive from working for the purpose of their group. While the disturbance theory expects external events to be sufficient for entering groups, Exchange Theory claims that entrepreneurs need to raise awareness for the benefits of entering. Whether a group becomes successful depends therefore on the quality of entrepreneurship. Notwithstanding, Berry (1978) argued that Exchange Theory and Disturbance Theory are not fully discrete. In his

perspective, entrepreneurial activity is an external stimulus that can become a form of disturbance, although Truman (1951) never mentions it specifically. However, as leaders are still part of the interest groups, this interpretation may not fully reflect the intentions of the original theories.

As mentioned in chapter 2.1, various research in the 20th century directly compared the Exchange Theory and Disturbance Theory. In a qualitative approach, Hofrenning (1995) interviewed entrepreneurs of religious interest groups in Minnesota. In 80% of the cases, a link between identifiable disturbances and the group mobilization was identifiable. Most common were interferences of the United States in South America, the Roe vs. Wade case at the Supreme Court and advances in gay rights movements. Regarding the Exchange Theory, examined groups offered only negligible entrepreneurial information to show benefits for possible members. Solidary benefits also did not play a major role, since few groups offered regular meetings of fellowships to their members. Hofrenning (1995) explained his findings in favour of the Disturbance Theory with the unique nature of religious groups and their response to injustice in society.

Other comparisons of Truman's (1951) and Salisbury's (1969) theories were rather mixed. The case of sixty US interest groups showed that new groups mostly rely on aggressive and independent entrepreneurs to collect funds from different sources (Nownes & Neeley, 1996). Early benefits to members were additionally found to be crucial, thus supporting the Exchange Theory. However, the survey data also showed that many founders formed interest groups in response to a specific event or series of events. Examples included the Vietnam War, the assassination of Martin Luther King and the Roe vs. Wade case at the US Supreme Court. While these events do not push individuals to join the group, they do act as disturbance and play an important role in stimulating the founding activity. Nownes and Neeley (1996) conclude that the different roles of entrepreneurship and disturbances in interest group mobilization give room for the theories to co-exist together.

This inference goes hand in hand with Berry (1978), who contrasted Disturbance Theory with Exchange Theory in the case of 83 interest groups in Washington DC. Through standardized interviews, histories of each group were coded as dependent variable, to examine the effects of disturbances and entrepreneurship in mobilization. Latter has been the more dominant factor in interest group origins. Leaders were documented to show extensive engagement for certain issues and gaining members through active sourcing. Only a third of the organizations was founded in a direct response to disturbances, mainly characterized by national defence and the nuclear arms race. However, the engagement of entrepreneurs was often connected to disturbances that initiated motivation to represent their own political interests. Like Nownes and Neeley (1996), disturbances were found to stimulate the founding of groups rather than pushing individuals to join a group. Berry (1978) eventually suggested that it

would be useful to move beyond the two theories and develop a more comprehensive theory that includes more influencing factors.

2.3 Population Ecology Theory

Existing mobilization theories were disrupted in the mid-1990s by the Population Ecology Theory (Lowery & Gray, 1995), which turned out to become the most prominent macro-level theory in contemporary interest group research. Compared to its predecessors, the Population Ecology Theory shifted the focus from external mobilization factors to population characteristics as driving force of mobilization. The number of interest groups is no longer seen as a sole artifact of external forces, but mainly a product of environmental constrains. At the core are the characteristics density and diversity, which have been originally proposed in population ecology theories by biology scholars for examining the populations of certain species (Real & Brown, 1991). Following, the concept was adopted by sociologists and applied to organisations of all kinds (Carroll & Hannan, 2000). With the transfer to political interest groups by Lowery and Gray (1995), two main arguments were brought forward. First, density as consequence of mobilization does not only depend on micro-level processes and external events. Second, the environment of interest groups is the most important factor to determine the density of their population.

Population Ecology Theory is generally studied in quantitative designs, setting itself apart from its predecessors (Lowery & Gray, 2015). While Truman’s (1951) and Salisbury’s (1969) theories often considered self-disclosures from interest groups to find mobilization factors, population characteristics can be better represented in numeric terms. Differences in Population Ecology Theory occur in time-series or cross-sectional designs (Lowery & Gray, 2015). Both approaches share one main core assumption: density dependence. This stipulates three stages in the development of an interest group population. At the early developing stage, the general growth is expected to be slow. Subsequently, founding and density increases rapidly until too many similar organisations compete for the scarce resources in the population. Competition becomes the limiting factor to the establishment of new interest groups and marks a tipping point. Density dependence predicts hereinafter a period of declining growth and high death rates among interest groups until a stable equilibrium is reached. In studies with time-series designs, all three stages of this development are observed over longer periods of time. However, theoretical applicability requires the assumption of fixed resources, and the population is modelled against itself over time. With cross-sectional designs on the other hand, the first period of growth is mostly not included because single cross-section barely contains cases of newly developing interest groups. Beneficially though, the necessary resources to survive within a population of similar organizations are directly modelled. The most dominant approach in contemporary research has been the ESA model by Lowery and Gray (1995). Here, environmental factors such as competition for limited resources or policy uncertainty are examined regarding their influence on population density.

2.3.1 Population Ecology Theory: Time-series Research

Studies on the population ecology theory, using a time-series design, have generally been based on collected interest group data from multiple decades. Nownes and Lipinski (2005) expanded a data set by Nownes (2004) of gay and lesbian rights groups to examine their US population between 1945 and 1998. The extensive data was composed from two different sources. First, the annual volumes of the Encyclopaedia of Associations as a collection of all associations in the US with corresponding information. Second, the New York Times Index, which was browsed for articles with relevant keywords to search in corresponding articles for mentioned interest groups. Organizational death was the dependent variable in the final study, coded with 0 for each year in active existence and eventually with 1 for the year of disbandment. Independent variables have been the density, issue salience, composition of Congress, the presidencies of Ronald Reagan and Bill Clinton, interest group age and periods of varying gay and lesbian rights advocacy. Results showed a significant relationship between organizational mortality rate and density dependence. With rising density, mortality rates decrease at first but increase again at high density. Furthermore, a non-monotonic relationship of an inverted U-curve between interest group age and dissolution rate was found. The lifespan of gay and lesbian interest groups is also affected by the societal and governmental environment they face.

In a subsequent study of Nownes (2010), he examined the density dependence in the case of US transgender interest groups between 1964 and 2005. The data collection was anew based on the Encyclopaedia of Associations, this time browsing for transgender-related key words. Additions were made through histories of transgender politics, relevant websites, and personal contacting. With the founding rate as dependent variable and density as independent variable, results provided another supporting evidence for density dependence. Nownes (2010) found a significant relationship between founding rate and density in form of an inverted U-curve, showing increasing founding with rising density and decreasing founding at a high level of density. He concludes that the support for density dependence shows the carrying capacities of populations, limiting the mobilization of interest groups. Furthermore, the results would allow to make predications over future developments within the population.

Fisker (2013) has been one scarce scholar to apply the time-series design of the population ecology theory in Europe. She examined the density dependence theory in the case of Danish patient groups between 1901 and 2011, a total time of 110 years. Using a population list based on existing databases, research projects, books, and parliamentary documents, she examined the founding year of interest groups as dependent variable. The number of interest groups in that year, equal to density, was utilized as independent variable. Density dependence was also found in this case, showing a positive curvilinear relationship between density and founding rate, thus refuting the assumption of unlimited population growth. Besides the reoccurrence of density dependence within an extensive data

set on interest groups, Fisker’s (2013) study provides additional value through its application in the Danish case. While most studies have been conducted in the pluralist system of the US, Denmark represents a corporative system with selected groups in privileged positions. Reproducing findings on density dependence in this context increases the external validity and its potential for generalization.

2.3.2 Population Ecology Theory: Cross-sectional Research

For cross-sectional designs, the dominant model has been, as mentioned above, the ESA model by Lowery and Gray (1995). The scholars established the model in their original proposal based on a study with state interest groups in the US. Dependent variable was the density per six selected interest guilds: construction, agriculture, and manufacturing in the profit sector; local government, welfare, and environmental in the non-profit sector. Independent variables were the number of constituents, constituent interests, interest certainty, interest-group-system age, and size of government. The number of constituents was individually assessed for each guild. For the profit sector, numbers of financially active members of each guild were collected. With non-profit guilds, the number of local governments per state was collected for local government, welfare was measured by the number of households using food stamps and full-time welfare workers, and environment was determined through the size of state memberships in an environmental advocacy club. Constituent interests were also individually assessed, mainly through state spending within the guilds of profit and non-profit sectors. Interest certainty was based on the party competition in each state, measured through the Ranney index. This can be attributed to findings that suggest high party competition is tied with high issue uncertainty for interest groups (Walker, 1991). Finally, system age was measured through the number of years between 1990 and a state joining the Union and size of government was assessed by the gross state product from government. In total, Lowery and Gray (1995) postulated 24 hypotheses, from which only two were unequivocally disconfirmed. Most outputs showed expected coefficients and significant results, however, welfare groups turned out as a problematic independent variable. Here, only few estimates turned out significant but were signed as expected. The generally persuasive result of the study led to five implications. First, population characteristics cannot solely be explained with reference to mobilization. Environmental constraints constraint the addition of more entities to the population through selective pressures. Second, private values and governmental action are necessary to create interest action. Third, density dependence limits unlimited growth of interest group populations. Fourth, increases of interest groups in the preceding decade can be linked to higher constituencies, resources of government activity and interest certainty. Fifth, the diversity of the population and the specificity of representation may change with increasing density.

Various studies applied the initial proposition of the ESA model to US interest group populations (e.g., Berkman, 2001; Chamberlain, 2019). Most recently, Holyoke (2021) replicated the model with new data on state interest groups. After a replication based on new interest group data between

2006 and 2017, density dependence was found again, while party competition in each state as policy uncertainty was not significant. Secondly, new independent variables were added to the ESA terms to test the robustness of the model. Number of constituents was modelled by the population in each state, party competition was replaced by per capita government spending and per capita long-term state debt was used as an operationalisation of stability. All three additions showed significant results, with a particular strong performance of state population, which never decreases growth of interest group numbers. Furthermore, count of interest groups as dependent variable was switched to solely trade associations, citizen groups, and labour unions, which are recognized as factual interest groups. This results in similar outcomes, leading to the addition of further independent variables. Thereof, state revenue, per capita measure of higher education and citizen ideology turned out to significant. As a third step, Holyoke (2021) examined possible extensions of the ESA model. By coding per group type, distinguishing between business-orientated and public interest groups, counter-mobilization as response to opposing groups offered a possible addition for future research. More importantly, a new ESA term called Capacity was tested. It consisted of measurements for legislative professionalism, number of government employees, state revenue, Democrats in state legislatures, governors party affiliation and state government ideology. The term tested significantly positive and showed a curvi-linear effect. Interestingly, the depicted data showed a slightly convex relationship between capacity and number of interest groups. A possible explanation that has been discussed is the effect of the recession after the financial crisis. In total, Holyoke (2021) concludes the original ESA model remains applicable to the present interest group population in the US. However, certain adaption would increase its accuracy and could be tackled in future research.

In Europe, research on interest group populations using cross-sectional designs has also been dominated by forms of the ESA model. Two widely recognized examples are going to be described below (Klüver & Zeidler, 2019; Messer et al., 2011). However, one exemption to the prevailing discourse has been the study by Berkhout et al. (2015). They aimed to examine the varying density of interest groups in the EU among economic sectors, based on supply and demand approaches. Supply variables are located within population and environment to influence density. Demand variables influence density from the institutional side and the policy process. Constituents, wealth, market integration of interest groups, the active proportion of institutions and umbrella organisations were recognized as supply factors. Demand factors were measured through the total level of EU regulation, spending on policies in the relevant sector, and information needed by administrators. The dependent variable of density was collected through the interest organizations active in the European Parliament per sector. Results showed a strongly skewed distribution of interest groups among sectors, with strong support for the supply variables and inconsistent evidence for demand variables. While the structure of economic sectors seemed to effect density significantly, number of legislative acts, DG

budgets and DG staff size did not show any effect. Berkhout et al. (2015) assumed that their results show an overestimation of political explanations over economic ones. They advised further research into the empirical relationships between supply factors and interest group populations.

Klüver and Zeidler (2019) did also examine the varying density of interest groups among economic sectors, this time with the ESA model in the context of German interest groups. They relied on the national lobbying register to map the size and composition of the German interest group population as dependent variable, arguing that these registers are the ideal source to measure populations of interest groups. Their independent variables included firms per economic sector as potential constituents, wealth of potential constituents, number of legislative bills per economic sector and policy uncertainty. Latter is operationalized through the policy positions of the members of parliament. Findings showed that the density increases with size and wealth of potential constituents. Density dependence was only found in relation with wealth, not the number of potential constituents. In other words, the growth rate of the interest group population did not slow down with increasing constituents but rather with increasing wealth of the economic sectors. The number of legislative bills did turn out to have a significant effect on density, while results for policy uncertainty have been mixed. This leads Klüver and Zeidler (2019) to conclude there is a reciprocal relationship between interest groups and legislative activity. They expect equal findings in other democratic countries when examining their business interest groups.

The study that is closest related with the approach of the present paper was conducted by Messer et al. (2011). They tested the ESA model of Lowery and Gray (1995) in the interest group population of the EU to examine the model’s transferability. Applying the ESA model to this case included methodological issues, as the EU is not easily compared to other forms of government. To fit the institutional structures of the EU system, the authors modified the ESA model on various fronts. Instead of comparing different states, as researchers in the US would do, economic sectors were equated to states – so called guilds. For their dependent variable of interest group density within the different guilds, the scholars used data from Berkhout and Lowery (2008). It was based on a sample selection from the Commission data base, the Parliament register, and paper directories. Potential constituents were measured by added value per economic sector for economic interest groups. Potential supporters for certain issues were utilized to operationalize constituents for social interest groups. To emulate constituent interests, Messer et al. (2011) did count the legislative acts moving through the EU legislative process and measured policy participation with the number of consultative bodies at the Commission. Finally, interest certainty was replaced by the element of policy uncertainty, which counted the number of open public consultations from the Commission that were relevant to each guild. Interest system age and size of government were not included in the study since these factors were seen as rather theoretical than an empirical relevance. The results did show mixed support for the

hypotheses of the authors and the application of the ESA model to the EU. In the first calculated model, no support for the postulated hypotheses was found. This changed however when social interest groups were excluded from the analysis to focus on corporate groups. Results revealed that more potential constituents and higher numbers of consultative bodies produce more corporate interest groups. Effects of legislative activity and public consultations as well as density dependence could not be found in the analysis. Messer et al. (2011) draw three conclusions from their results. First, regarding the zero-results for social interest groups, it appears that social interest groups in the EU are mobilized by different processes than business interest groups. Possible explanations included that high public support would be represented in democratic responsiveness, therefore requiring less interest group population than for issues that lack public support. Second, the authors explained that the missing evidence for density dependence can be put down to the lacking maturity of the EU interest group system. While the US interest group population had significantly more time to develop, the EU community was expected to be in a growth period at the time of the study. Third and lastly, notwithstanding the mixed results, Messer et al. (2011) recognised the ESA model as a useful theoretical insight to study the EU interest groups with potential for future research.

3 Theoretical Framework

Based on the literature review it becomes apparent that the determining factors for interest group mobilization are diverse. Multiple theories compete to explain the development of interest group population through different variables, while existing studies show varying proof for them. The present paper takes on the existing literature to answer w*hich variables influence the density of interest group populations in the EU.* For this purpose, the most dominant approach in contemporary literature is utilized: the Population Ecology Theory. The following chapter follows along a theory-based line of arguments to substantiate this decision, show shortcomings of competing theories, establish the fit of the Population Ecology Theory, identify variables, and establish several hypotheses. This approach helps to increase the internal validity of the study by decreasing the hazard of overlooking important factors (Kellstedt & Whitten, 2018).

3.1 Exclusion of Competing Theories

This preference of the Population Ecology Theory over the theories by Truman (1951), Olson (1965) and Salisbury (1969) is based on three reasons. First, methodical reasons make the Population Ecology Theory the best fit for this study. The Disturbance Theory (Truman, 1951) would ideally be tested with a time-series design that includes data of the years before the disturbance and afterwards, to test fro long-term effects (LaPira, 2014). Unfortunately, there is no reliable data for the EU available to apply such a design (Messer et al., 2011). For the theories by Olson (1965) and Salisbury (1969), corresponding studies relied on qualitative research to collect their data (Hofrenning, 1995; Nownes & Neeley,

1996). However, based on given data and calls for increased quantitative research in the EU (Bunea & Baumgartner, 2014), this paper does pursue a large-n approach. Available data of this scale does not offer the opportunity to examine the leadership characteristics of various interest groups to accept or reject assumptions of Olson (1965) and Salisbury (1969).

Secondly, Population Ecology Theory has become the most recognized and proven approach for contemporary research of interest group populations since its introduction (Halpin & Jordan, 2009). A multitude of studies (Fisker, 2013; Holyoke, 2021; Nownes & Lipinski, 2005; Messer et al., 2011) have shown that the structure of interest group populations is key to explain their survival strategies, adaptions, tactics, and varying influence. These findings exceed the realm of interest groups in the US, where Lowery and Gray (1995) first tested their assumptions, as the theory has been applied in very different political systems around the world. Through this process, details of the Population Ecology Theory have developed since its first publication and can be applied carefully for the present purposes.

Thirdly, basing this study on the Population Ecology Theory does not mean that Truman (1951), Olson (1965) and Salisbury (1969) are disregarded. Lowery and Gray (1995) themselves reference to all their three predecessors to substantiate their own research interest. While none of them focussed their research on population characteristics, all are interest in why some groups are better represented than others and all acknowledge in some way the implications that come with changing populations. Truman (1951) did mention that dense interest group communities could contribute to political stability, while Olson (1982) raised concern that too many interest groups could threaten economic growth. Salisbury (1992) later assumed that interest mobilization would not only be triggered by private value, but on a conjunction of private value and governmental action, creating interaction between population growth and policy realisation.

Taking the three described reasons into account, creates the basis to decide on the Population Ecology Theory to examine variables that influence interest group density in the EU. However, to establish the fit of latter, a detailed description of its application to the present case is required. This is presented in the following paragraphs.

3.2 Application: Population Ecology Theory

Proclaiming that mobilization events are not sufficient to fully explain density of interest group populations, as contrary suggested by Truman (1951), Olson (1965) and Salisbury (1969), the Population Ecology Theory of Lowery and Gray (1995) represented a novum in academia. Successive studies provided support for this perspective, as seen in the literature review. Focusing solely on external mobilization factors was therefore superseded by perceiving the environment of interest groups as the key factor to explaining their population.

As described in the literature review, hypotheses derived from Population Ecology Theory can be either tested with time-series or cross-sectional designs. Both approaches are based on the core assumption of density dependence and show similar figures of population development in different studies (Lowery et al., 2015). However, their results are not perfectly comparable. Time-series models focus on all parts of population development with slow growth in the beginning, rapid growth in the middle and a period of density dependence at the end. Cross-sectional models on the other hand generally lack a perspective into the first period where interest groups first develop and gain legitimacy. Furthermore, the different approaches require different models and therefore different data. Time-series designs review longer periods of time and require more data on the population in this timeframe (Nownes, 2004; Nownes & Lipinski, 2005; Fisker, 2013). The population is modelled against itself over time, assuming that resources stay constant over time. For cross-sectional design, resources are directly modelled to comprehend spatial variations in density. Here, the ESA model (Lowery & Gray, 1995) has been most popular among scholars. It highlights how environmental forces and competition for resources with similar organizations influence the density of lobby populations. To create a cross-sectional comparison, Lowery & Gray (1995) originally followed the tradition of island biogeography (Lack, 1947). American states were treated as unconnected island, which could be compared to each other as different cases. Other researchers, particularly in the EU, treated different sectors as island to create units of analysis in absence of comparable states (Messer et al. 2011; Berkhout et al. 2015).

For the present case, the cross-sectional ESA model is the best fitting choice for two reasons. First, existing studies that have used time-series designs were based on density data of multiple decades. Nownes (2004) examined 48 years of US interest groups focussing on gay and lesbian rights, Nownes and Lipinski (2005) extended this research to 53 years and Fisker (2013) exceeded both by using data on 110 years of Danish patient groups. As Messer et al. (2011) have already mentioned, there is no available data of this scope for the EU. This has not changed since the introduction of the Transparency Register in 2011. Although the Publications Office of the EU (2022) publishes biannually data sets to save snapshots of the general interest group population, the archive only starts in June of 2015. A personal inquire at the Publications Office revealed that files before that cannot be rebuilt by the provider for technical reasons (N. Teixeira, email communication, May 05, 2022). Thus, the Transparency Register only offers a span of seven years, thereby severely undercutting the range of data from examples such as Nownes and Lipinski (2005) or Fisker (2013). Second, the lack of perspective into the first period of slow growth in density dependence that comes with a cross-sectional approach is presumably not relevant for the purpose of this study. While Messer et al. (2011) highlighted that the EU interest population may still be in a general growth phase, they acknowledge that the phase of establishment has been overcome. Others even argue that the population growth is slowing down since most interests are now represented on the EU level (Mazey & Richardson, 2005). The focus of

the ESA model on the second and third stage of population development is therefore sufficient for the present case. Both arguments substantiate that an application of the ESA model is most suitable for answering the given research question. A direct replication of Messer et al. (2011) is however precluded as their approach has seen mixed success and the data situation has changed in the meantime (see chapter 4.2). This gives the present paper the opportunity to combine existing literature with an innovative new theoretical perspective that adds further knowledge.

3.2.1 The ESA Model

Origins of the ESA model are tied to the academic field of biology, where it has been established to examine populations of different species (Wilson, 1992). Researchers assumed that the biodiversity would be greater with more solar energy, with more stable climate, and within a larger area. Therefore, resulting in the ESA name, as short form for Energy, Stability, and Area. While biodiversity can be transferred to interest group populations with the terms of density and diversity, the assumptions on area, solar energy, and stable climate require further adaptions (Lowery & Gray, 1995). These adaptions depend on the examined case, presently interest groups in the EU.

Findings of previous studies show that two general adaptions are necessary to test hypotheses on the EU interest group population with the ESA model. First, as mentioned in the preceding chapter, the original model of Lowery and Gray (1995) follows the tradition of island biogeography by comparing different states as unconnected islands. This comparison is not possible in the EU, since its interest group population is a unified system in Brussels. Messer et al. (2011) and Berkhout et al. (2015) solved this issue by utilizing different industry sectors instead of states. In other words, one sector represented one island with a certain density of interest groups. All sectors were compared against each other to create different units of analysis. This assumes that different interest group sectors are equally responsive and requires enough different sectors. The success in preceding studies gives sufficient reason to apply this approach equally in the present paper. Second, Messer et al. (2011) found that social interest groups are differently mobilized than corporate interest groups. They assume that social issues with high public support require less interest group, as they are already represented through democratic responsiveness of the political system. However, their adaption of the ESA model, which has been influential for this research, can only explain variables that significantly mobilizes corporate interest groups with certainty. The present theoretical framework therefore considers its interpretation of the ESA model to be solely applicable for corporate interest groups from the outset. Social interest groups are not included into the analysis. This may reduce the possibility of generalizing the results, but equally enables more precise and theory-based predictions. Furthermore, the literature agrees that economic interests indisputably outweigh other interests, whether it is on US state and federal level, in the EU, or in other national interest group populations (Baumgartner & Leech, 2001; Fisker, 2013; Lowery & Gray, 1998a; Lowery et al., 2005).

In sum, the presented version of the ESA model generally considers economic-orientated sectors as units of analysis. In the following paragraphs, detailed adjustments within the different terms of the ESA model are further described. To retain a common thread of logical arguments, the chapters are arranged in the order of Area, Energy, and Stability.

3.2.1.1 Area: Constituency. Scholars assumed that the density of species would increase with more available area (Wilson, 1992). What seems plausible for plant and animal life presents the question which analogue is most appropriate proxy of area for interest organisations. Lowery and Gray (1995) suggested that constituents of an interest group are most fitting. One cannot expect business interest groups to mobilize without the existence of associated companies and organisations. If there are, for example, only a few companies present, the resources for an interest group to survive are naturally limited. One group is probably sufficient to represent the interests of the present constituents. However, with more constituents available, the interest groups have more resources to survive, resulting in more active interest groups. The relationship between area and density is therefore most importantly positive. Later studies, applying the ESA model in Europe, agreed with this interpretation of area (Berkhout et al., 2015; Klüver & Zeidler, 2019; Messer et al., 2011). This leads to the first hypothesis for the present paper:

H1: *Density of corporate interest groups in the EU increases with a higher number of potential constituents in the corresponding sector of interest.*

The underlying assumption of H1, that density increases with available area, has been shown to be limited by the condition of density dependence, resulting in a curvilinear relationship between area and density (Lowery & Gray, 1995). In biology, species are competing for resources in the available area, which limits the population growth rates at higher density through competition (Wilson, 1992). This works equally in interest organizations. After the initial periods of growth, the population matures and becomes highly dense, eventually leading to a decrease in density. The sociological process of competition is the underlying explanation for this development. (Nownes & Lipinski, 2005). It refers to “constraints arising from the joint dependence of multiple organizations on the same set of finite resources” (Carroll & Hannan, 1995, p. 115). With increased interest groups in a population, the groups must compete for scarce resources to survive and/or receive only insignificant utility through the additional representation (Lowery et al., 2015). Therefore, competition is affected by density, while affecting the founding and death rates of interest groups itself.

While the general adaption of area for H1 has been easily translated into the EU context, it’s questionable whether the density-dependent character is equally applicable in the European context. Messer et al. (2011) did not find evidence for density dependence, arguing that the system is still in its initial growth phase and lacks maturity compared to the US. Notwithstanding, arguments of Mazey

and Richardson (2005) of potentially slowing processes of growth continue to hold value. Other scholars in Europe could find typical density dependent relationships in national interest group populations (Fisker, 2013; Klüver & Zeidler, 2019; Unger & van Waarden, 1999). These findings and the length of time elapsed since Messer et al. (2011) lead to the assumption that the EU interest group population has overcome its growth period. Therefore, the second hypothesis for the present study is deducted as follows:

H2: *The growth of corporate interest groups in the EU shows curvilinearity with higher constituency due to density dependence.*

3.2.1.2 Energy. To translate the biological assumption that biodiversity is greater with more solar energy, the question for an equivalent resource to sustain interest group populations arises (Lowery & Gray, 1995). Theoretical transposition and findings have been less homogeneous in the existing literature, compared to the Area term. Three dimensions, based on Messer et al. (2011), is therefore examined with individual hypotheses to adapt the Energy term into the present case.

The first dimension is *legislative activity*. According to Lowery and Gray (1995), the Energy term to interest groups are constituent interests: resources that are available for interest groups to persuade their constituents to engage in lobbying processes. In other words, the present or future activity of the government in the field that is related to the interest group sector. Higher activity is expected to lead to higher density, as it gives more energy to the interest groups, therefore presenting a positive relationship (Rasmussen et al., 2014). Messer et al. (2011, p. 170) rephrased constituent interest into levels of “legislative activity”, which is also going to be used for the present paper. Assessing the legislative activity for the EU holds characteristic challenges, since legislative activity cannot be tied to one singular institution in Brussels. Instead, it is split into a coordinated procedure of the Council, Commission and Parliament. A fitting operationalisation therefore requires a consideration of coordinated legislative proposals between all institutions and existing findings (see chapter 4.2.3). While the studies of Messer et al. (2011) and Berkhout et al. (2015) did not find significant results, other scholars found evidence for a relationship between density and legislative activity (Baumgartner et al., 2009; Klüver & Zeidler, 2019; Lowery & Gray, 1995; Rasmussen et al., 2014). This gives reason to carefully base the operationalisation on prolifically executions, while assuming an effect of legislative activity on density that is reflected here:

H3: *The density of corporate interest groups in the EU increases with higher legislative activity in their individual field of interest.*

The second dimension to transposition the full scale of biological solar energy into resources for interest groups is *policy uncertainty*. Lowery and Gray (1995) applied the likelihood that the

government will change certain policies as second Energy dimension. Given a low chance of any change, interest groups would have less incentive to lobby for maintenance or change themselves. However, with higher chances of policy change, interest groups can be expected to increase their efforts for maintenance or change of corresponding policies (Walker, 1991). Lowery and Gray (1995, p. 12) called this transposition “interest certainty” to represent the perceived certainty of a policy and resulting incentives to mobilize. Messer et al. (2011, p. 170) rephrased this contrarily to “uncertainty or the likelihood of policy change”, from which former is used for the present paper.

Furthermore, not only terminology differs in this case, but also the application to the political systems. Lowery and Gray (1995) measured the uncertainty in their ESA model through an index of party competition between Republicans and Democrats. This was based on the US system, where most policy proposals originate from two parties in elected state parliaments. These proposals often do not pass the hurdles of committees and the chamber floor – making actual policy change less likely than policy death (Mahoney, 2008). Messer et al. (2011) highlight two remarkable differences in the political system of the EU. First, the EU parliament is not dominated by two parties and does not function as the sole origin of legislation. This leads to the second difference, whereas most proposals are written into law after a consensual co-decision by the main EU institutions. Starting the policy-making process is therefore inseparable tied to a high probability of actual change (Mahoney, 2008). Based on these differences, Messer et al. (2011) proposed to use the starting point of legislative processes instead of party competition for the operationalisation of uncertainty in the EU case. This signals the likelihood of change to all stakeholders, therefore creating policy uncertainty. However, an actual start of the process is difficult to determine as the origins can be diverse. Based on the Commission’s right of initiative in mind (Hix & Hoyland, 2011), Messer et al. (2011) suggested public consultations of the Directorates General as the earliest point in the legislative process to operationalise policy uncertainty.

However, the results of Messer et al. (2011) did only show positive coefficients but no significance. The authors critically assume that open consultations could occur too early in the policy cycle to signal policy uncertainty. Taking this into consideration, while remaining within Commission as legislative starting point to resemble uncertainty, it is consequential to recognize a subsequent step in the process as possible operationalisation. Following an open consultation, the Commission publishes a draft act, which is once again published for open feedback (European Commission, 2022b). Afterwards, the Commission can either adopt or reject the initiative. In the case of adoption, the legislative proposal is closed for feedback and transmitted to the Council and Parliament. This gives the present study two options for a fitting operationalisation, it could count draft acts or adopted proposals in a sector of interest. In fact, between the two, the official adoption of a consultation by the Commission is to be selected. It is the more prominent signal of policy uncertainty towards stakeholders and commences the legislative process with all EU institutions included. Therefore, only adopted consultations

with closed feedback status are used for the second Energy dimension in the EU and the following hypothesis emerges:

H4: *The density of corporate interest groups in the EU increases with consultations in their individual field of interest that have been adopted by the Commission.*

The third dimension of the Energy term is *policy participation*. Messer et al. (2011) introduced this to the ESA model to reflect the unique system of the EU. It is another resource that supports interest groups to engage in lobbying activities. More specifically, the Commission, as the main initiator of EU legislation, relies on participation to gain expert knowledge and technical information. This reliance is due to a relative lack of resources on part of the Commission considering its range and number of policy decisions (Greenwood & Young, 2005). To overcome the lacking resources, organized groups are solicited to participate and consult with their expertise in committees, expert groups, and working parties (Bouwen, 2002; Mazey & Richardson, 2005). Interest groups can use this opportunity of providing their knowledge simultaneously to influencing the outcomes of discussed policy proposals. Messer et al. (2011) used the number of consultive bodies and show that they had a significant positive effect on corporate interest group density. The source for counting the bodies was a database called Consultation, the European Commission and Civil Society (CONECCS), which closed around 2008 in favour of a broader transparency initiative (Verheyden et al., 2013). As an alternative, the EU Register for Expert Groups is used to quantify the opportunities for interest group participation. A further discussion on this operationalisation can be found in chapter 4.2.5. The suggested hypothesis of Messer et al. (2011) of policy participation is adopted as follows:

H5: *The density of interest groups in the EU increases with more expert groups created by the Commission for interest group participation.*

3.2.1.3 Stability. Finally, the biological ESA model assumed that a stable climate over different seasons and years would create greater biodiversity (Wilson, 1992). Lowery and Gray (1995) translated this assumption to a general stability for interest group systems, adding two further variables test two assumptions of existing literature. First, the age of an interest system would lead to higher group density (Olson, 1982). Second, increasing size of the government would also increase the interest group density (Mueller & Murrell, 1986). Since Lowery and Gray (1995) were basing their research on interest group systems in the US states, their assumptions hold difficulty in translating them to the EU system. System age cannot be compared to other values, as the EU institutions and interest group sectors do not have specific years of accession, whereas US states joined the Union in differentiable and traceable years. Government size is also not generally translatable to the EU, since the different roles of the Council, Commission and Parliament make a comparison of their staff or agencies inapplicable. Furthermore, Messer et al. (2011) highlight that general assumption of the Stability term is more of

theoretical than empirical relevance. In fact, the results of Lowery and Gray (1995) did not support that interest system age and the size of government would determine interest group density. For these reasons, the present paper does not draw any hypotheses from the Stability term put forward by Lowery and Gray (1995).

Resulting from the adaption of the ESA model to the present paper, a final formula remains to examine the density of the EU interest group population. While it shows resemblance with the one suggested by Lowery and Gray (1995, p. 12), it is reasonable adjusted to represent later findings and specifics of the EU:

$$\begin{aligned}\text{Density of corporate interest groups} = {} & a + b_1 \text{ Constituency} \\ & + b_2 \text{ Constituency squared} \\ & + b_3 \text{ Legislative Activity} \\ & + b_4 \text{ Policy Uncertainty} \\ & + b_5 \text{ Policy Participation}\end{aligned}$$

4 Research Design, Data, and Methods

To consolidate the presented theoretical framework, the following chapter discusses how available research designs, data and methodologies were assessed for its application. First, an overview over acknowledged research designs is given to present possible options. An argument regarding the present case justifies the final decision for this study. Second, the operationalizations of the independent variables is described based on accessible data. This concludes in a graphic representation of the ESA model to visualize taken steps for a contribution to the methodological debate. Third and finally, a discussion of objectivity, reliability, and validity determines the robustness of answering the given research question.

4.1 Available Research Designs

The present paper aims to answer the research question, which variables influence the density of corporate interest group populations in the EU. In approaching this goal, the research is mainly based on the Population Ecology Theory and the derived ESA model, as described in the theoretical framework. Applying the existing approach, mainly specified by Lowery and Gray (1995) and Messer et al. (2011), predefines the design selection for this study as a deductive, quantitative, observational, and cross-sectional research design. The concomitant implications of these characteristics are set out in the following paragraphs.

Starting with the deductive character, deductive approaches are “basing analysis on pre-existing theory” (Gale et al., 2013, p. 3) and try to confirm or falsify those. An inductive approach uses “detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher” (D. R. Thomas, 2006, p. 238). In other words, empirical data is surveyed to generate a theory. For the present paper, the theory of Population Ecology Theory was already given beforehand by Lowery and Gray (1995) and refined through multiple scholars (Holyoke, 2021; Klüver & Zeidler, 2019; Messer et al., 2011). The research trajectory therefore follows a clear deductive approach.

Second comes the distinction between qualitative and quantitative designs. The qualitative approach is based on interpretivism and constructivism (Sale et al., 2002). Reality is constructed individually based on the situational context and therefore changing constantly. Quantitative research on the other hand is based on positivism. It assumes that phenomena can be reduced to empirical variables representing the objective reality, which is not tied to human perception. Both designs furthermore differ in their approach to attain validity. In qualitative research, causal processes between the dependent and independent variables are observed in purposeful selected samples that undergo in-depth exploration (Gschwend & Schimmelfennig, 2007). Thus, qualitative samples do not aim to represent a full population (Sale et al., 2002). Quantitative designs use contrarily large sample sizes within a value-free framework to create a representative sample of the population (Gschwend & Schimmelfennig, 2007). Thus, results become generalizable and increase the validity of the corresponding study. At this point, it becomes obvious why latter approach has been the common choice for research on the Population Ecology Theory (Berkhout et al., 2015; Klüver & Zeidler, 2019; Messer et al., 2011). Variables that influence the density of an interest group population can be better examined if the population is best possible represented in the study. Applying a quantitative design in the present paper is therefore well suited for the topic of research.

Third, the observational characteristic results from feasibility rather than given examples in the literature. Observational design and experiments both aim to establish a causal relationship between the independent and dependent variables, avoiding interference of other influences (Kellstedt & Whitten, 2018). In an experiment, the researcher achieves this by controlling for the values of the independent variable. Simultaneously, the values are randomly assigned to the participants in the experiment to avoid a pollution of the comparison by interfering variables. While this approach has proven to be efficient in establishing causal relationships, it cannot be applied to every case. For interest group populations, factors that influence real-world population growth cannot be controlled for. Therefore, an observational design is going to be applied, which is a popular alternative in political science. The values of the independent variable occur naturally here, without any control of the researcher. However, variability in the independent variable across cases and variation in the dependent

variable are prerequisite. These qualities of observational designs fit well with the aim and variables of the present case.

Further differentiation within an observational design can be made between time-series and cross-sectional designs, which makes the fourth characteristic of the present study. The former refers to a comparison between measures of one unit that have been taken over time, latter between individual units at one point (Kellstedt & Whitten, 2018). Since the ESA model is a cross-sectional design by default (Lowery & Gray, 1995), the present study accordingly sticks to this. This is also supported by the given arguments in chapter 3.2.

4.2 Data and Operationalization

To test the proposed hypotheses and answer the research question of the present paper, dependent and independent variables need to be operationalized. This entails the shift from a conceptual level to a real measurable level (Kellstedt & Whitten, 2018). Existing studies that have applied the ESA model give an idea for possible operationalizations. However, some contemporary sources have not been available when former studies were conducted, while other sources are nowadays inaccessible. The following paragraphs therefore describe the used data and its application for the present study.

4.2.1 Dependent Variable: Density

Examining the EU interest group population has been difficult for a long time due to two reasons. First is the lack of a shared understanding, which characteristics define an interest group. The term of interest groups itself was criticized by Jordan et al. (2004) for reflecting significant ambiguity in the research field. C. S. Thomas (2004) opposed this, arguing that the broad term is necessary to prevent exclusion of interests in research. He defined interest group as “an association of individuals or organizations or a public or private institution that, on the basis of one or more shared concerns, attempts to influence public policy in its favor” (C. S. Thomas, 2004, p. 4). Beyers et al. (2008) added three general key features for interest groups. Organisation is the first, relating to the nature of a group that aggregates forms of political behaviour. The second feature is political interest, which refer to attempts of influencing policy outcomes and pushing public policy in a desired direction. Third, informal interactions with public officials without seeking for public offices and elections is the last feature.

The second reason was the lack of a general registration mechanism in the EU. Research projects tried to overcome this by collecting data to give an overview on the population (Schmitter & Streeck, 1999; Philip, 1985). Berkhout and Lowery (2008) examined the value of such academic projects and further included commercial directories, memberships of consultation committees, and registries of the European Commission. They concluded that all sources had little overlap with each other, preventing from broad generalisations based on their data. For this reason, Messer et al. (2011) based their study on a data set that was created by Berkhout and Lowery (2008) for their research purposes.

Compared to the actual population, the scope was rather limited with only 168 interest groups and firms actively engaging in one or more EU institution, reducing the external validity of the research.

With the 2011 interinstitutional agreement on the Transparency Register in the EU, a new and valuable alternative to examine the interest group population has emerged (European Commission, 2022a). The Register covers “all activities carried out with the objective of influencing the formulation or implementation of EU policy or legislation, or the decision-making processes of the European Parliament, the European Commission and the Council of the European Union, or other EU institutions, bodies, offices and agencies, with the exception of certain specified activities”. Provision of legal or professional advice, spontaneous meetings, administrative procedures, delivering information on request and activities of social partners are not covered by the register. All individuals, legal persons, formal or informal groups, associations, and networks that engage in the framework of covered activities shall register. Governments, intergovernmental organisations, diplomats, churches, political parties, and regional authorities are excepted from registration. Technically, the registration is voluntary for interest groups. However, certain activities with the EU institutions are conditionally tied to a registration in the Transparency Register, making it de facto mandatory. Some examples of conditional measures include meetings with decision-makers, meeting of staff, participation in events or briefing sessions, consideration for mailing lists, and access to premisses of the EU institutions. The decisions for conditionality principles are taken individually by each institution and have different frameworks in the Council, Parliament, and Commission. Generally, the Transparency Register offers a solution to the main issues of examining the EU interest group population. It fits the broad definitions of interest groups (Beyers et al., 2008; C. S. Thomas, 2004) and yields a general registration mechanism for the EU.

Critics have often lament that the Transparency Register falls short in delivering real transparency to the process of lobbying in the EU (Politico, 2020). The main criticism has been focussed on the lacking disclosures of meetings. Yet, there are also some downfalls that might limit its use for assessing the EU interest group population. Critics argue that the conditionality would leave too many loopholes to enforce registration, for example by declaring meetings as spontaneous and thus avoiding registration. The individual decision making of each institution on conditionality, can increase the chance of loopholes – a critique that has been mainly targeted on the Council. While the Transparency Register was mainly promoted and run by the Commission and Parliament, the Council only put few conditional measures into place. This could again leave room for possible avoidance of registration. Furthermore, measures to punish violation of the rules have been criticised as not forceful enough, which may increase the chance of certain interest groups risking a punishment.

Despite the reasonable critique and the lack of long-time data, the Transparency Register remains highly valuable for the present research purpose. This is highlighted by two practical arguments. First, the search mask allows to filter for fields of interest, enabling the selection of corporate sectors for the presented hypotheses (European Commission, 2022a). Second, a recent interinstitutional agreement between the Parliament, Council and the Commission on a mandatory Transparency Register introduced a new registration form in 2021 to reflect new requirements (European Commission, 2022c). Registrants received thereupon an invitation to amend their registration between September of 2021 and March of 2022, otherwise they would be removed from the register. This makes the current data set of the Transparency Register highly relevant, as virtually all included interest groups can be considered as currently active. From an academic perspective, Berkhout (2015) claimed that interest group registers are the ideal source to examine density and diversity of population. Using the EU Transparency Register is also more extensive than the data set of Berkhout and Lowery (2008) that has been utilized by Messer et al. (2011), extending the external validity for the present paper. Finally, using the data of the Transparency Register increases the comparability with interest group research that also relied on registers (Klüver & Zeidler, 2019).

In practice, the Transparency Register was filtered by fields of interests through the search mask (European Commission, 2022a). The number of interest groups per field was collected to measure density. All this was conducted on the 22nd of May 2022 to receive the most recent data available. Data outputs of the search mask were exported for future analysis and documentation purposes. Subsequently, the fields of interest relating to social interests were manually excluded to reflect the corporate character of interest groups that is central for this research (see Appendix A). Specifications to motivate exclusions followed examples from preceding studies (Lower & Gray, 1995; Lowery & Gray, 1998b; Messer et al., 2011). Applying these examples directly to the fields of interest in the Transparency Register (European Commission, 2022a) was not without ambiguity, as there were almost no identical role models. Examples such as “Employment and social affairs” highlight this issue since corporate interests overlap with employment policies but not with most contents of social affairs. In these cases, a manual check on suitability was conducted by researching background information of interest groups that were connected to the field of interest in question. Another technical issue has been the possibility of interest groups to register for multiple fields of interest at the same time, therefore being counted repeatedly in the assessment of density. However, this should not pose a critical problem to the analysis as the large number of captured interest groups (N = 12,217) should offset any systematic error in the dependent variable across the 40 fields of interest. The specific data on all fields of interest can be found in the Appendix A. From here on, all corporate fields of interest (N = 30) were treated as units of analysis and the number of included interest groups represents their density as the dependent variable. The corresponding descriptive data is noted in Appendix B.

4.2.2 Independent Variable: Group Constituency

According to Walker (1991, p. 187), the most common formular to assess constituency is “to base an association upon a tightly knit commercial or occupational community in the profit sector”. Lowery and Gray (1995) therefore did measure the corporate constituents in different US states with numbers on payrolls, sales and establishments of construction firms, farms, and manufacturing factories. Since studies on EU interest groups are not able to compare constituents among different states, business sectors or guilds were utilized as replacements. Messer et al. (2011) used economic activity, operationalized by added value per sector in the EU. Sectors were categorized by the Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) Rev. 1.1 classification system, which included fifty-two different industry sectors. For Berkhout et al. (2015), the International Standard Industrial Classification (ISIC) was utilized. Its most recent version, ISIC Rev. 4 offers 20 superordinated sectors with 56 subordinated categories. Fitting data on added value per industry sector is offered by the OECD (OECD, 2022).

Unfortunately, the preceding operationalisations cannot be transferred directly to the present study. The NACE classification system of Messer et al. (2011) has been updated since then to Rev. 2.2, which only includes twelve sectors (European Commission, 2008). Contemporary data on added value from Eurostat relies on this classification, making it difficult to assess a causal relationship due the low N. With the ISIC classifications used by Berkhout et al. (2015), the matching process with the dependent variable would leave multiple cases unassigned. The system of the UN provides clear industry focussed categories, while the fields of interest in the Transparency Register refer to broader terms (see Appendix A). However, this obstacle can be overcome by operationalising economy activity through given financial information in the Transparency Register of the EU. Interest groups are asked to present a series of figures on employees, accreditations for the Parliament, costs, and annual turnover of the institution. Out of the given options, the information on turnover is closest to indicate economic activity. Berkhout et al. (2015) also showed that turnover increases the density of interest group populations. The required data cannot be extracted through the regular search mask of Transparency Register but is available through the Publications Office of the EU (2022). For the present study, data sets of June 2019, 2020, and 2021 were downloaded to increase the depth of data. Interest groups can present their turnover either in absolute amounts or by selecting a range. In the given absolute amounts, two outliers caused further complication. In June 2019, the Università degli Studi di Catania had to be excluded as their statement exceeded 17 trillion Euro, which was not plausible after further research. The same was done with De Vlaamse Waterweg NV in the data from June 2020, exceeding 200 trillion Euro. Given ranges were manually converted into their mean value to receive unitary values for analysis (e.g., 0-99,999 was replaced by 50,000). After settling the data set, each interest group in the Transparency Register was coded for their associated fields of interest as filter variables. This enabled

to calculate the annual turnovers per field of interest in the three considered years. Afterwards, the turnovers of the three years were averaged to operationalise constituency for the analysis.

4.2.3 Independent Variable: Legislative Activity

To operationalize legislative activity, Messer et al. (2011) and Berkhout et al. (2015) both relied on the EUR-Lex database. It is run by the Publications Office of the European Union and offers an online gateway to EU legal documents including the Official Journal of the EU, treaties, legal acts, case-law, international agreements, and preparatory documents (EUR-Lex, 2022). Legislation that is no longer in force can also be accessed. The advanced search mask allows to filter for key words, publishing date, document type and identification codes.

Messer et al. (2011) utilized classification codes to match them with their examined business sectors. Some sectors were matched with three or more relevant codes, creating some overlap between sectors with shared interests. Subsequently the number of legislative and preparatory acts for each code were counted in three different years. This activity shall count each legislative proposal each time as it moves through the process, as it is expected that interest groups would become increasingly attentive to proposals with each step closer to a final decision (Gray et al., 2005). Berkhout et al. (2015) relied on descriptions of economic sectors, outlined in the ISIC classification scheme. Key words that covered each sector were used in the Boolean search mask of EUR-Lex to identify fitting legislations. The total number of EU legislative acts connected to a sector were used at the independent variable to operationalize legislative activity.

Due to the lack of significant findings in Messer et al. (2011), the present paper does not take preparatory documents into consideration. They include proposals, positions, and opinions, which may not be sufficiently significant legislative acts to mobilize interest groups. Instead, legal acts were collected through EUR-Lex, which includes regulations, directives, decisions, and recommendations. The data base offers a directory of legal acts with 20 main domains and several subdomains. All fields of interest in the dependent variable were matched to fitting domains and subdomains to assess the number of legal acts (see Appendix C). There was some overlap, created by similar interests and terminologies. This led to adverse multiplications of observations, a methodological downside also encountered by Messer et al. (2011). Subsequently, legal acts were counted for each field of interest from 2019 to 2021. Legislation in force was equally considered as legislation that is currently not in force. In doing so, each proposal that moved through the legislative process is treated as an event of interest, potentially increasing the mobilization of interest groups.

4.2.4 Independent Variable: Policy Uncertainty

Lowery and Gray (1995) operationalized policy uncertainty with an index of party competition, which is not applicable to the EU case (see chapter 3.2.1.2). Messer et al. (2011) therefore did utilize open

public consultation of the Commission to shift policy uncertainty from a conceptual to a measurable level. Through an online data base, all consultations were collected and matched to the interest groups sectors based on their name. Additionally, classification codes from EUR-Lex were consulted for further relevance checks. Some consultations turned out to be relevant for more than one sector and were therefore matched with multiple. The total number of matched consultations per sector was finally used as operationalisation of policy uncertainty.

However, the lack of significant results in Messer et al. (2011) led to the conclusion that an open consultation might be to too early in the policy process. For this reason, the present paper is solely going to consider closed and adopted consultations of the Commission. This shall send a more striking signal of policy uncertainty to the affected interest groups, since this is the point where the legislative process including Council and Parliament starts (European Commission, 2022b). While all consultations were collected on the Your Voice website at the time of previous research, the data base has now migrated to a new website. Its data base includes 2,449 initiatives at the time of writing (European Commission, 2022d). All entries can be filtered through a search mask by keywords, topic, stage, feedback status, feedback period, type of act, and document category. For this operationalisation, the stage was set to “Commission adaption” and feedback status was filtered by closed consultations. Topics were matched with the fields of interest given by the Transparency Register (see Appendix D). “Culture and Media” and “Foreign Affairs and Security Policy” had to be matched twice due to overlap. The number of closed and adopted consultations between 2019 and 2021 was then counted per topic to determine the level of policy uncertainty for each field of interest.

4.2.5 Independent Variable: Policy Participation

As suggested by Messer et al. (2011), the present study also does include the independent variable of policy participation to reflect the unique system of the EU. The Commission encourages stakeholders and experts to engage in committees, expert groups, and working parties to overcome its own lack of resources in developing extensive policies (Bouwen, 2002; Mazey & Richardson, 2005). Broscheid & Coen (2007) found that invitation of the Commission causes many interest groups to actively participate and lobby in the given domains. Among the active interest groups, business interests are dominating even more than already in the general population (Rasmussen & Carroll, 2014; Wonka et al., 2010). In their adaption of the ESA model, Messer et al. (2011) operationalized policy participation through utilizing consultive bodies. These are comprised of public officials and interest representatives that are appointed by the Commission. Names of overall 134 consultive bodies were matched to interest sectors to count a total number for each of them.

Unfortunately, CONECCS, the database that has been used by Messer et al. (2011) to research consultive bodies, was closed around 2008 (see chapter 3.2.1.2). Since CONECCS is not available for

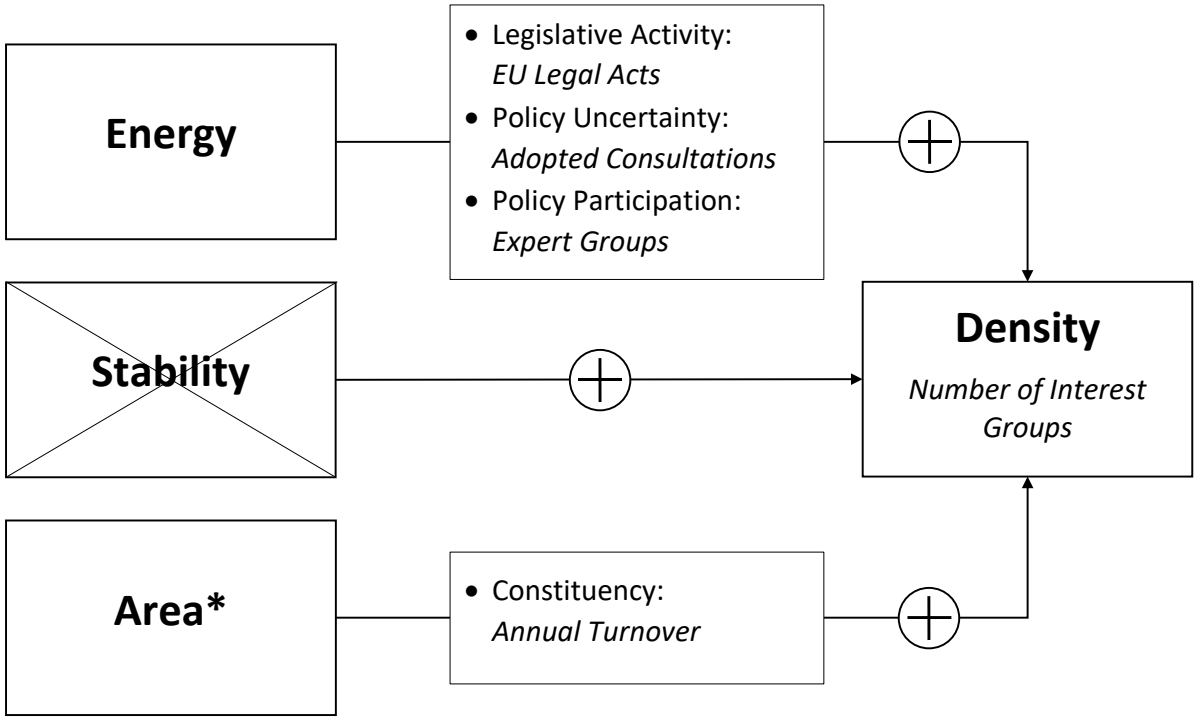
the operationalisation of policy participation, the present paper had to explore other possibilities. One possibility has been the integrated bodies of the European Economic and Social Committee (EESC) (EESC, 2022). However, this would mean that only one consultative body of the EU would be recognized. A preliminary data review did also reveal a lacking fit between the EESC bodies and fields of interest from the Transparency Register. As a second alternative, the utilization of expert groups was considered. Expert groups are “advisory bodies that assist the European Commission and its services in preparing legislative proposals and policy initiatives” (European Commission, 2022e). They can be created through a written decision by the Commission or by the initiative of a Directorate General. According to Gornitzka and Sverdrup (2008), expert groups are the most frequently used form of consultation for the Commission to gain technical and specialised knowledge. While the composition is intended to diverse interest representatives, it was found that that business sector representatives dominate the groups (Vassalos, 2008). Through the ability to influence decision in the crucial early stage of decision making, expert groups offer an ideal opportunity for interest groups to participate.

The present research utilized the Register of Commission Expert Groups and Other Similar Entities (European Commission, 2022e) to conduct the operationalisation of policy participation. It enables to filter for expert group characteristics, including lead DG and group policy area. Latter was matched with the fields of interest from the Transparency Register (see Appendix E). Like legislative activity and policy uncertainty, some policy areas showed contextual overlap with multiple fields of interest, creating occasional multiplications of observations. These cases were checked for relevance to the fields of interest and matched repeatedly where appropriate. Unfortunately, the data base on expert groups by the European Commission (2022e) does not offer data from the preceding years. For this reason, only current data from the day of elicitation was collected (22nd of May 2022). This reflects all active expert groups at this point. Matched group policy areas were then counted to conduct the policy participation opportunities for each field of interest individually.

Considering the described research design and its implementation through available data leads to an intermediate step, complementing the comprehensive description of the ESA model with recapitulatory visualization in figure 1. The model combines existing knowledge with an innovative theoretical perspective to examine corporate interest group populations in the EU. Operationalizations of the different terms profit particularly from the changes, as they allow for precise and systematic data collection. This will offer new opportunities for the methodological debate.

Figure 1

Visualisation of the adapted ESA Model



Note. This figure visualises the three different terms of the ESA Model: Energy, Stability, Area. Each is in a positive relationship with the dependent variable of Density. The Stability term was dropped in the present paper (see chapter 3.2.1.3). Subsequent boxes of the Energy and Area terms list the corresponding variables, their operationalisations are written in italic.

* Limited by density dependence.

4.3 Objectivity, Reliability, and Validity

Criteria to evaluate the robustness of quantitative studies can be divided into three different terms: objectivity, reliability, and validity (Yilmaz, 2013). Starting with the first term, objectivity “expresses the idea that the claims, methods and results of science are not, or should not be influenced by particular perspectives, value commitments, community bias or personal interests” (Sprenger & Reiss, 2014, p. 1). While quantitative research is often assumed to have high resistance against interference of mentioned specifications, it is nevertheless tied with interpretation and manipulation of the researcher (Westmarland, 2001). Identifying a subject of research is already a subjective decision, equally as selecting sources for the literature review and data sources. Under these considerations, the present paper cannot guarantee to be purely objectivity either. However, the research process grants the claim of a sufficient level. Despite the subjectivity of choosing interest groups in the EU as a general topic, the theory of interest was derived from a multitude of sources to gain a theory-based foundation. The utilization of different sources has been described in the operationalisation (see chapter 4.2)

to give the reader an understanding for taken decisions. Consequential objectivity is further increased by the open access of all included data, which enables direct replications. Results that are derived from this data are presented comprehensively in chapter 5 and in the appendices to guarantee as much objectivity for the interpretation process as possible.

Second is reliability, which describes “the extent to which applying the same measurement rules to the same case or observation will produce identical results” (Kellstedt & Whitten, 2018, p. 123). In other words, with a reliable measurement, repeated measures of the same variables would produce equal results for each trial. An unreliable measurement would obscure the underlying relationships and produce inconsistent results. Furthermore, there is hardly any reason to evaluate the validity of a study without given reliability. Turning therefore to the assessment of the present study, the reliable measurement of its variables is given for multiple reasons. The approach on operationalisation and source selection is, like objectivity, key for this claim. Dependent and independent variables must be clearly defined and operationalized to enable the precise measurement of involved concepts. This has been achieved in chapter 4.2. Many defined operationalisations rely on existing approaches that have proven themselves in the past to be consistent through multiple measurements. The selected data sources are generally provided through trustworthy institutions, mainly the European Commission itself. All this gives the opportunity to compare accessible data across studies with the findings of this paper.

Validity as the third term is the most important criterium to assess research quality of causal theories (Kellstedt & Whitten, 2018). A distinction can be made between internal and external validity (Bryman, 2012). Internal validity describes whether the relationship between dependent and independent variables can be ascribed to causality. In other words, is it ensured that the independent variables explain changes in the dependent variable? If the research design allows for high confidence that this is the case, the study is recognised to have high internal validity. While observational studies are often considered to be inferior to experiments in this regard, there are four hurdles that can be overcome to ensure sufficient internal validity (Kellstedt & Whitten, 2018). First, it needs to be evaluated whether there is a credible causal mechanism before conducting the study. This has been achieved in this case through the theory-based application of the ESA model, which explicitly states the causal mechanisms between independent and dependent variables. Different studies from the literature review consolidate the causality, cumulating in the present theoretical framework and operationalisations. The second hurdle aims to eliminate the possibility that changes in the dependent variable may cause the independent variable to change, so-called reversed causality. Cross-sectional studies have a general predisposition towards this issue. Unfortunately, this cannot be sufficiently solved by using data from past years for most of the independent variables and current data for the dependent variable. Higher density and therefore bigger influence in previous years could be influencing the

turnover of corporate industries, as lobbying approaches often lead to monetary advantages (Alexander et al., 2009). Legislative activity and policy uncertainty are also possibly affected by reverse causality, where the administration reacts to pressures of interest groups and their initiated ideas (McFarland, 1991). There is no literature on the direction of expert groups as the operationalisation for policy participation, but it seems likely that it could also be affected in both ways. Notwithstanding, results from previous studies remain good chances for a causal arrow from independent to dependent variables (Berkhout et al., 2015; Lowery & Gray, 1995; Messer et al., 2011). The meaningfulness of the work is therefore still given, but only if the possibility of reverse validity is considered (Kellstedt & Whitten, 2018). With the third hurdle, a necessary covariation between dependent and independent variables is examined. As Kellstedt and Whitten (2018) mentioned, bivariate connections are a direct way to demonstrate covariation. Relevant results can be found in Messer et al. (2011), Berkhout et al. (2015) and in chapter 5 of this paper. Finally, the fourth hurdle examines whether other factors possibly pollute the independent variables and interfere the causal relationship. This is commonly critical for observational studies, however the present studies overcome the issue through using multiple independent variables. These have proven themselves collectively to have a causal relationship with the dependent variable in existing studies on the ESA model. Based on existing results, all independent variables that could have an influence were selected to eliminate pollution best possibly.

External validity on the other hand describes the degree of confidence to apply the results to a broader population that exceeds the units of analysis in the corresponding study (Kellstedt & Whitten, 2018). The more generalizable a measurement is, the higher the external validity. For the present study, the envisaged external validity is limited to the EU from the outset. In the past, the ESA model has been already showed its applicability in other contexts such as the US. The specific selection of independent variables, operationalisations and sources allows therefore for a generalization to other, maybe forthcoming, corporate interest groups in the EU, but not beyond. This may seem as limiting at first but offers a broad range considering the indisputably dominance of economic interests in the EU and elsewhere (Baumgartner & Leech, 2001; Fisker, 2013; Lowery et al., 2005). A further argument in favour of external validity can be drawn from the presented internal validity, as both tend to go hand in hand (Harris, 2002).

5 Analysis

The following data analysis presents results of the ESA model to contribute to existing knowledge from previous studies. Ordinary least squares (OLS) regression was used to test the five proposed hypotheses. This is appropriate given the cross-sectional nature of the ESA model and has been commonly used for analytical approaches in the study of interest group populations (e.g., Messer et al., 2011). In general, three main benefits of this approach can be stated according to Graddy (1999): Using a statistical

regression is accessible, its specifications are robust, and the achieved results have been valuable for theoretical explanations and practical forecasts in the past. All statistical tests were carried out by using SPSS Statistics (28th version, IBM Corp, 2021), with the significance level set to $\alpha = .05$. Each independent variable was mean centred for interpretation purposes of curvilinear and linear trends. This is particularly relevant for H2, which requires a squared variable of constituency to test the expected curvilinear relationship within a linear regression. The taken approach is based on the model of Messer et al. (2011). A discussion of the results and their implications in the context of existing literature can be found in chapter 6.

To test whether the necessary assumptions for an OLS regression were fulfilled, the tests and checks suggested by Graddy (1998) were conducted beforehand. The first assumption, that a set of independent variables can express the dependent variable through a linear function with an error term, is given by the theory-based selection of each variable. Secondly, observations and error terms can be assumed to be uncorrelated by including beta coefficients as fixed constants in the regression. A Shapiro-Wilk test tested the third assumption that error terms are expected to show a normal distribution. It did not show a significant departure from normality, $W(30) = 0.963$, $p = 0.363$. The corresponding Q-Q-Plot of standardized residuals also showed no deviation from a normal distribution (see Appendix F). Heteroskedasticity was debunked with a White test, which did not deviate significantly from homoskedasticity, χ^2 (19, $N = 30$) = 15.066, $p = 0.718$. A further inspection of the residual scatter plot did show a rectangular distribution without any recognisable clusters (see Appendix G). The fourth assumption for an OLS regression can be accepted by consulting the scatter plot and correlation matrix of the independent variables. Here, no sign of a significant linear relationships between the independent variables was found (see Appendix H). This sets the present study apart from Messer et al. (2011), where considerable multicollinearity was found, which can inflate the standard errors of regression coefficients. The research design further includes more observations than independent variables (N = 30) to fulfil the second obstacle of the fourth assumption.

After verifying all four assumptions, the OLS regression was conducted with the given data. An overview on its results can be found in Table 1, combined with a corresponding scatter plot in Figure 2. Table 1 includes three partial models, from which the final two reflect explorative approaches that are explained later in this chapter. The most relevant part is Model 1, as it uses the initial population of corporate interest groups and tests the proposed hypotheses. Here, constituency and the estimate of squared group constituency turned out to be significant predictors for density. Both predictors of the Area term showed their predicted signs, indicating a curvilinear relationship in the shape of a slightly ascending reversed-U (see Figure 3). In practical terms, this reflects an increasing density of corporate interest groups with higher turnover, which eventually slows down and possibly reaches a tipping point. However, the two predictors show small coefficients, indicating that both only result in

noticeable influence at high values. An evident explanation can be found in the underlying values of the operationalisation, as reported turnovers of influence groups vary across multiple million Euros (see Appendix A). Notwithstanding, H1 and H2 can be accepted based on the findings of the OLS regression.

Table 1

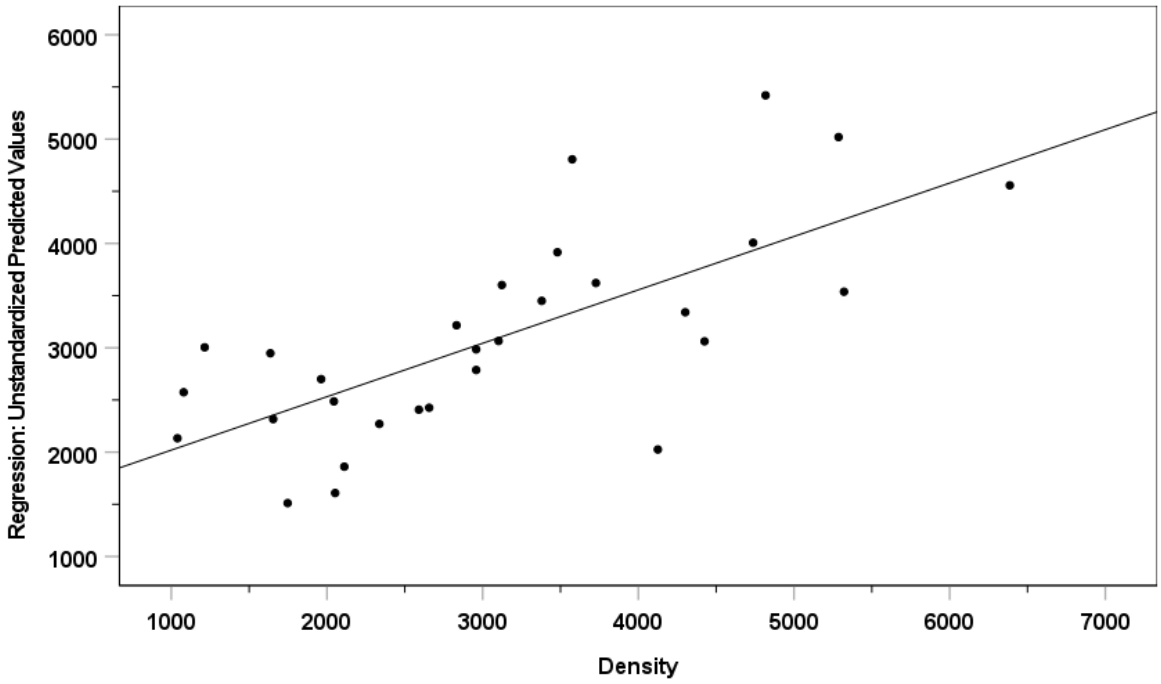
OLS regression results of the ESA Model.

	Dependent Variable: Density / Number of groups		
Independent Variables	Model 1	Model 2	Model 3
Area: Constituents	9.754E-6*	8.584E-6	-1.109E-5
	(0.000)	(0.000)	(0.000)
Area squared: Constituents²	-2.251E-13**	-1.934E-13*	-1.284E-13
	(0.000)	(0.000)	(0.000)
Energy 1: Legislative Activity	-0.768	0.148	11.767
	(1.186)	(1.256)	(6.019)
Energy 2: Policy Uncertainty	-31.725	-17.021	46.101
	(34.929)	(37.261)	(134.630)
Energy 3: Policy Participation	38.516**	48.309**	51.247
	(10.946)	(10.783)	(23.811)
Constant	3,648.870**	3,495.203**	4,175.981*
	(26.377)	(251.407)	(560.765)
R^2	0.512	0.472	0.867
N	30	40	10

Note: Coefficients with standard errors in brackets. All values centred for interpretation purposes. *p<0.05; **p<0.01

Figure 2

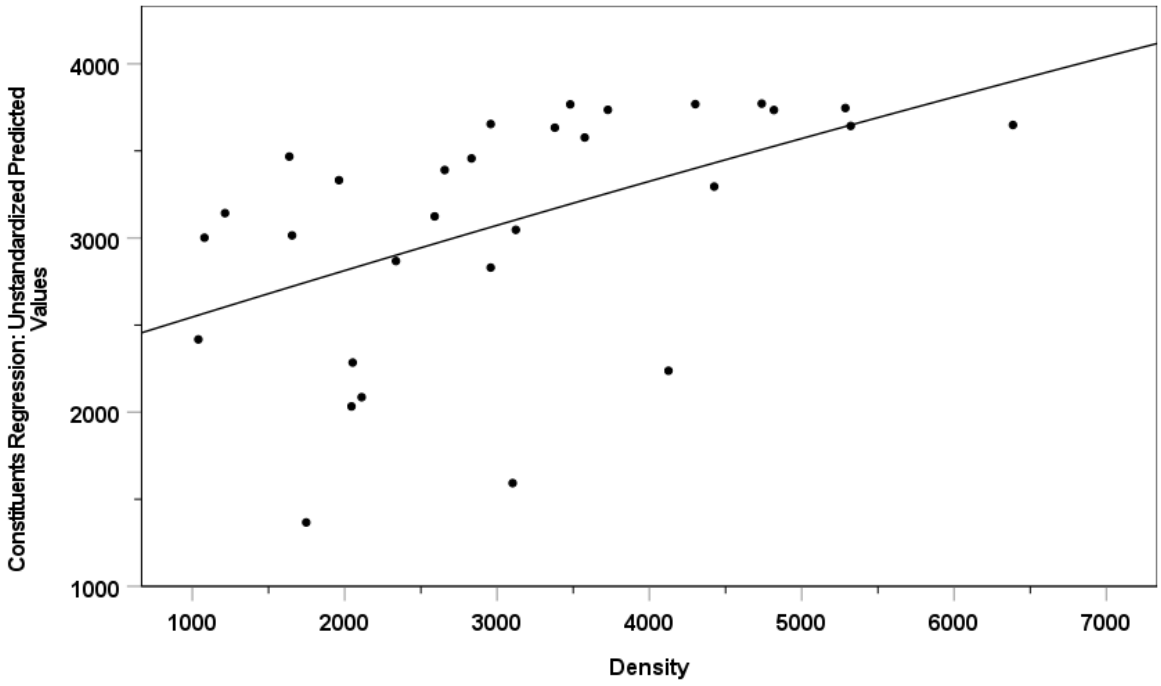
Scatter plot of the regression in Model 1



Note. The scatter plot reflects the relationship between density (dependent variable) and the unstandardized predicted values of the regression in Model 1. All independent variables were included.

Figure 3

Scatter plot of unstandardized predicted values in the Area term



Note. The scatter plot reflects the positive curvilinear relationship between density and the Area term. Here, constituency and its squared variable were solely considered as independent variables.

Conflict between the hypotheses and results can be found in the first two Energy dimensions of the calculated ESA model (see Table 1). Both predictors of legislative activity and policy uncertainty turned out to be not significant. Moreover, the signs of the estimates pointed opposite to the predicted direction. This means that, under the consideration of lacking significance, the number of interest groups declines with higher numbers of legislative acts and adopted consultations in their field of interest. Yet, the results of the first two Energy dimensions are not sufficient to allow for a rejection of the null hypothesis in the cases of H3 and H4. As opposed to the two other Energy dimensions, policy participation did turn out to be a significant predictor in Model 1. The number of corporate interest groups increases in a specific field of interest with higher policy participation, therefore accepting H5. In specific terms, the density increases by 38.5 interest groups per additional expert group in their field of interest.

To gain further insights into the factors influencing density of the EU interest group population and have more comparability with Messer et al. (2011), two models were added to the analysis (see Table 1). Model 2 combined all fields of interest from the Transparency Register. Its results were partially in line with Model 1, squared constituency dimension and the third Energy dimension turned out to be significant predictors for interest group density. Interestingly, the impact of policy participation seemed to be even stronger than in the first model. One expert group increases the density per field of interest by 48.3 interest groups. However, the regular dimension of constituency did not reach a critical significance level ($p = 0.086$) in contrast to its squared counterpart. This implies a quadratic but non-positive relationship. Legislative activity and policy uncertainty were once again not significant predictors of interest group density. To test for possible characteristics of specifically non-corporate interests, Model 3 tested all fields of interest that were not considered for Model 1 (see Appendix A). Within this approach none of the independent variables showed significant a result. This could result from the absence of any relationship between the variables and density of social interest groups. However, the low N decreases the likelihood of finding significant results severely if there is no strong underlying effect and does therefore not allow for this conclusion. Model 3 is further limited due to the lack of reliable generalizations and pre-tests showed that not all assumptions for an OLS regression were fulfilled.

6 Discussion of Findings

Presented results show that the Area term confirms the predicted increase of density with higher constituency per field of interest, limited by density dependence. This is in line with one of the core assumptions in Population Ecology Theory (Lowery & Gray, 1995). Density is further significantly increased with higher policy participation per field of interest, as seen in the third dimension of the Energy term. Legislative activity and policy uncertainty on the other hand did not have a significant effect

on density. The results even indicated that higher values of the two variables are associated with lower density. Thus, a mixed picture emerges from the findings compared to the proposed hypotheses (see table 2). In the explorative calculation of two additional models, findings highlighted the different mobilization processes for corporate and social interest groups. To identify the implications of these results, the following chapter reflects on content, methodology, and the ESA model itself. In addition, they are linked with existing studies to draw a cohesive picture of the current state of research.

Table 2

Concluding overview on proposed hypotheses

Hypotheses	Results
H1: Constituency	Accepted
H2: Density Dependence	Accepted
H3: Legislative Activity	Rejected
H4: Policy Uncertainty	Rejected
H5: Policy Participation	Accepted

Note. This table presents an overview of the results for all proposed hypotheses. The full content of each individual hypothesis can be found in Chapter 3.2.1.

6.1 Corporate Interest Groups

Focussing on the population of corporate interest groups in the EU, the findings of the presented ESA model are generally in line with the results of Messer et al. (2011). A positive relationship between constituency and density was found despite the changed operationalisation, utilizing annual turnover in each field of interest instead of added value per economic sector. The results support the assumption that both measurements are closely linked with each other and predict density (Berkhout et al., 2015; Klüver & Zeidler, 2019), giving an additional option for future research. It must however be noted that effects on the number of interest groups only become noticeable at substantial increases of turnovers. Adding €100,000 to the annual turnover only results in one more interest group in the corresponding field of interest.

More interestingly, the results of chapter 5 indicate a curvilinear relationship between area and density. This is in line with H2 and confirms the existence of density dependence in the corporate interest group population of the EU. The growth of considered interest groups does not increase infinitely with higher constituency but decreases once a certain level of density is reached. Presumably, too many similar organisations compete in their population for the same resources and therefore limit further growth. While this specific relationship has also been observed by a multitude of studies (e.g., Fisker, 2013; Lowery & Gray, 1995; Nownes & Lipinski; 2005), Messer et al. (2011) did not find evidence

for density dependence in the EU. This inconsistency between their results and the present study can be ascribed to two possible reasons. First, Messer et al. (2011) relied on a sample collected by Berkhout and Lowery (2008) including a selection of 168 interest groups from the Commission data base, the Parliament register, and paper directories. This limited sample might have been insufficient to supply the sufficient statistical power to detect density dependence. With 12,217 considered interest groups in the present sample, the positive curvilinear relationship between area and density might be better represented. A second reason for the discrepancy to Messer et al. (2011) findings is the passed time between their data collection and the current data. The data base for the first test of the ESA model in the EU originates back to 2005, creating a time span of seventeen years to the time of analysing and writing the present study. Messer et al. (2011) stated themselves that density dependence is a sign for maturity of the system that inhabits the population and that their results indicate a continuing flux of the EU interest community. Discussed reasons included the extensions of the EU at the beginning of the 21st century and continues expansion of the EU's policy mandate through treaty adaptions. The now found indication of density dependence is a sign that the development process of the EU has come recognisable closer to maturity over the past decade. Since 2011 only Croatia has joined as a new member state (European Parliament, 2021) and no new main treaty was adopted (European Commission, 2022f). These major developments are possibly influencing the interest group population, with density dependence as a sign of a near-complete representation of the civil society spectrum (Greenwood, 2007). However, interpreting the significant curvilinearity must take the severely limited curvature into consideration (see Figure 3). This might be an indicator that there is still room for growth in the population and EU system is still an evolving state. In other words, a turn towards declining density does not seem to be expectable in the immediate future.

Turning to the Energy term, the discussion of results can be divided into two parts. First, the two dimensions, legislative activity, and policy uncertainty, did not turn out to be significant predictors for density. Second, the dimension of policy participation that showed a significant positive relationship with density. Starting with the former two dimensions, both are in line with the findings of Messer et al. (2011). However, they are signed contrarily to the expected direction, indicating lower density at higher values of the predictors. Looking closely at legislative activity, this seems in the face of its low coefficient (see table 1) negligible. Instead, the result can be seen in a line of persistent rejection of this variable as a predictor for interest group density in the EU (Berkhout et al., 2015; Messer et al., 2011). Even the specification of the operationalisation in the present study did not break this trend. For policy uncertainty, operationalised through adopted consultations, the negative signed coefficient carries more weight. It indicates that density would decrease by roughly 32 interest groups per additional adapted consultation in the same field of interest. As this is not significant though, the most obvious assumption is failed operationalisation of policy uncertainty. Messer et al. (2011, p. 185)

already started this discussion in their study, conceding that they “may have simply failed to identify an appropriate proxy for the concept of policy uncertainty comparable to the use of levels of party competition in the US case”. Since the specification of this proxy has not yielded significant different results in the present study, future research needs to consider other possibilities of operationalising this part of the ESA model. For now, policy uncertainty cannot be accepted as a significant predictor for density. It is however recognised that the dimension is rather ambiguous and may be better transposed by other possibilities.

In the case of policy participation, operationalised by the number of expert groups, the interpretation is more straightforward. The significant positive relationship with density is consistent with Messer et al. (2011) and Broscheid and Coen (2007). Indeed, this finding is particularly gratifying since CONECCS, the initial data source of Messer et al. (2011), had been closed. The present study replaced this approach with counting expert groups per policy area in the Register of Commission Expert Groups and Other Similar Entities (European Commission, 2022e). Findings support this taken decision and further strengthen the general relationship between policy participation and interest group density. Given the character of the Commission, which relies on expert knowledge and technical information due to lacking resources (Greenwood & Young, 2005), interest groups are offered with an opportunity to engage in policy making from an early stage. In face of the given results, they seem to welcome this opportunity and take their chance of influencing future policies. From the demand side, the Commission might therefore increase the density of the population with every established expert group.

6.2 Explorative Models

Besides initial focus population of corporate interest groups, tests were also conducted with the overall population and social interest fields. Considering the results of Model 2 and Model 3 (see table X), further insights into the mobilization processes of EU interest groups can be derived. This is however not based on a priori hypotheses and limited, in the case of Model 3, by a severely low N. Therefore, any conclusions must be further examined in future purposive research.

Model 2 (see table 1) contained all fields of interest (N = 40), including corporate and social fields, to test possible relationships between their density and the independent variables. Despite having a higher N, no significant indicators for density dependence were found. Instead, the results indicated a quadratic but not positive relationship between area and density. This would mean that density is low in interest fields with low and high turnovers, while it is high at medial turnovers. As this seems implausible, the explanation most probably is to be found when taking the results of Model 3 into consideration. Here, social interests show a negative sign for the relation between area and density, which could possibly offset the positive relationship in the case of corporate interest groups. As Messer et al. (2011) already suspected, these results give increasing evidence that corporate and social interest

groups are brought to Brussels for different reasons. This puts Model 2 in difficult position, as an exhaustive consideration of all fields of interest in the ESA model does not realistically find reasonable success. From a theoretical standpoint, it can be argued that corporate and social interest groups might create cluster as they represent different populations. This could hurt the assumption of independent residuals as necessity for a linear regression (Graddy, 1998). Notwithstanding, the overarching consideration in the ESA model still raises interesting implications on the front of the third Energy dimension. After merging all interest fields, policy participation was still significantly related with density, adding about 48 interest groups per expert group. This is even higher than in Model 1 and strengthens the importance of policy participation in the mobilization process of interest groups.

In Model 3, only social interest groups (N = 10) were considered for the OLS regression (see Table 1). It is mainly striking that none of the independent variables turned out to be significant predictors for density. The most obvious explanation for this can be found in the statistical defectiveness of the model. Due to the low N of social interest groups, significant results become less likely if there is no strong underlying effect. However, Model 3 remains to offer a glimpse into implications for future research. Starting with the Area term, its coefficients and signs enable to derive indications and consistencies with other studies. Despite lacking any significance, reducing constituency seems to increase the density of social interest groups; the lower the turnover, the higher the density. This is in line with findings of Messer et al. (2011), who argued that policy makers in a democracy would be required to respond to social interests with high constituency irrespective of actual lobbying activities. In other words, high constituency should be reflected in democratic outcomes even without lobbying activity, while low constituency requires mobilization of interest groups. If this explanation is applicable to the present study, is in view of operationalising constituency through annual turnover however at least questionable. Lowery and Gray (1995) previously argued that monetary variables cannot be the ideal operationalisation to measure constituency for social interest groups. The signs of coefficients in the Area term should therefore not be overly interpreted for any unsubstantiated conclusions. Same applies to the negative sign for curvilinearity. Yet, future examination of the relationship between area and density of social interest groups may consider the possibility of curvilinearity, as it is often overlooked in social sciences (Karantka-Murray, 2010).

Looking at the Energy term in Model 3 and comparing it with Messer et al. (2011), an inconsistent picture emerges. Legislative activity was not significant, suggesting that social interests are not more responsive to legislative activity than corporate fields of interest. However, Messer et al. (2011) did find a significant positive relationship. Policy Uncertainty did not have a significant effect on the density of social fields of interest, while Messer et al. (2011) found a significant negative relationship. For the third Energy dimension of policy participation, again no significant results were observed in the present study. This indicates that the mobilization of social interest groups is not benefitting from the

opportunity of participation in expert groups of the Commission. Messer et al. (2011) on the other hand, found that higher policy participation would increase the density of social interest groups. For all these three independent variables, the most plausible relationship for the inconsistent results is the low N and lacking statistical power. Future research with a social focus might give consider certain variables again, this time under better statistical conditions.

7 Conclusion

Which variables influence the density of EU corporate interest group populations? In short, constituency and policy participation are increasing the density of corporate fields of interest. Former is limited by density dependence. The population of Brussels' Gucci Gulch is thus largely determined by annual turnover and expert groups. In the upcoming and final chapter an in-depth answer will be given to the research question. This is complemented by an updated perspective on the applied ESA model, adding to the existing literature, and providing comprehensive recommendations for practical matters. Furthermore, limitations and possible paths for future research are discussed to nudge ideas in interest group literature.

Findings of increased density with higher constituency and corresponding density dependence are in line with the core of Population Ecology Theory. Thus, strengthening the applicability of the Area term in the EU. For the specific case of the EU, it leads to the conclusion that the overall corporate interest group population has reached a status of maturity. This was not the case at the time of Messer et al. (2011) and adds considerable knowledge to the existing literature. Public servants and interest groups in Brussels can expect that the population is getting closer to complete representation of corporate interests, which eventually leads to high competition and decreasing density. However, a tipping point does not seem to be immediately expectable due to the weak expression of curvilinearity. For now, it is advisable that public officials consider the influence of annual turnover on density. Some groups might be disadvantaged in their representation by economic factors. Interest groups should prepare that forthcoming competition might limit access to necessary resources. Generally, the EU could profit from the reached maturity as it enhances economic development (Heo & Hahm, 2015).

In the case of the Energy term, mixed results lead to less straight-forward conclusions. On the one hand, more active expert groups and their possibility of policy participation increase density. EU public officials can use this to strategically tackle underrepresentation of certain corporate groups. If changes in the economy, such as energy transition, require more attention to a specific sector, the Commission could create more expert groups in their field of interest. This would increase representation for the sector and give the EU more access to expert knowledge. On the other hand, legislative activity and policy uncertainty did not have noticeable influence on density. The quantity of legislative

proposals can therefore be interpreted as a part of interest group work that does not play a role in mobilization. Future ESA models should cease it as independent variable. The variable of adopted consultations requires further research as it may not present an optimal operationalisation of policy uncertainty.

Explorative analysis beyond the a priori proposed hypotheses revealed noticeable differences in the mobilization process between corporate and social interest groups. Hence the approach of focussing specifically on corporate interests when applying the ESA model has been reinforced. Social interest groups do seem to be subject to different variables that influence the density of their populations. Most noteworthy is the assumption that the democratic representation possibly requires less density for high constituency and more density for low constituency. However, any implications in this regard must be considered with great caution, as the explorative analysis is characterized by a critically low N and a generally a posteriori approach that violates impeccable research methods. Practical recommendation should not be derived until further studies are conducted.

7.1 Limitations

The present paper sets itself apart from previous studies by its theory-based approach that utilizes new and comprehensive data to examine the density corporate interest groups in the EU. However, the findings are at the same time subject to several limitations that require critical reflection in the following paragraphs.

Empirical implementation has been limited by the technical restrictions that came with the Transparency Register and its 40 fields of interest. First, the number of fields provided by the Transparency Register limited the N for subsequent analysis and its statistical power. Empirical classification systems such as NACE or ISIC give further reason to assume that 40 fields of interest are insufficiently differentiated to reflect the complexity of interest groups. Second, the matchmaking between fields of interest and data for the Energy term included certain obstacles. For some cases of the legislative activity dimension, matching categories were only partially applicable, due to the lack of better alternatives (see Appendix C). In other cases, categories of one independent variable had to be matched multiple times to the fields of interest in the dependent variable (see Appendix C, Appendix D & Appendix E). This led to undesired multiplications of identic observations, reproducing an issue of Messer et al. (2011). Third, interest groups can subscribe to multiple fields of interest at the same time during the registration process for the Transparency Register. Critically viewed, this restricts the assumption of an independent island biogeography (see chapter 3.2.1). Technically a manual matching process would have avoided this limitation but is not feasible with 12,217 groups. Fourth, the low number of social fields of interests in the Transparency Register decreased the chance of finding significant effects, weakening the reliability of explorative findings (see chapter 5 and chapter 6.2). However, this

limitation does not reduce the implications of the initial findings and remains an opportunity to utilize the collected data in favour of possible indications despite their shortcomings.

Further limitations were created by lacking data availability. As mentioned in chapter 4.3, the absence of longitudinal data prevented the implementation of a time-series design to rule out reverse causality. Therefore, internal causality of the utilized model is reduced. Lack of similar data has also reduced the general comparability with Messer et al. (2011), especially regarding the Area term. Instead of added value per complete sector, the turnover of registered organisations in the Transparency Register was considered to operationalize constituency. Thus, a possible bias can be created as the turnover of organisations in the register may differ from organisations that do not engage in lobbying activity in Brussels. The findings, however, fundamentally support this approach and qualify turnover as additional operationalisation of constituency in future research.

Overall, however, the strengths of the present study outweigh its limitations. The approach is based on consistent theory-based reasoning and offers the necessary objectivity, reliability, and validity to gain academic progress. Utilizing the Transparency Register over 12,000 interest groups and recent data from the EU increases the external validity of the ESA model and Population Ecology Theory in general. This does not only broaden the field of macro-level studies in contemporary interest group research, especially in the EU, but also gives advantage over preceding studies without a comparable foundation of examined groups.

7.2 Future research

To finish this paper, four possible venues for future research are suggested. First, the field of macro-level theories in interest groups research does not only require further extension but also more linkage with micro-level theories (Hanegraaff et al., 2020). With the given findings, it is possible to examine the implications of varying density on achieved influence of corporate interest groups in the EU. Lowery & Gray (2015) themselves noted that the Population Ecology Theory is technically neutral in the debate on influence, but hint that the characteristics of density and diversity play a role in the outcomes of public policy. Given that high constituency and higher policy participation now showed to increase density of corporate interest groups in the EU, future research can examine whether affected fields of interest also profit from this through higher influence on policies.

Second, as mentioned above, the differentiation between corporate and social interest groups in the EU requires further and explicit examination. Possibilities include inter alia specific studies on the mobilization factors for social interest groups or a comparison that includes both sides of the isle. Consulting the Transparency Register could increase the comparability with the present paper and would give sufficient data to examine a multitude of groups.

Third, more specialised research could engage with the role of policy uncertainty in the EU adaption of the ESA model. While Messer et al. (2011) and the presented results could not find any relationship with density, there is good reason to assume an operationalisation issue as the underlying reason. Considering alternatives and their fit could further specify the ESA model and its use in the EU. The direct measurement of economic policy uncertainty by Azqueta-Gavaldón et al. (2020) through AI-processing is one of many possibilities that come to mind for this purpose.

Fourth and finally, in the medium to long-term future, the Transparency Register could present itself as a data source for time-series designs. With sufficient longitudinal data, future research could attempt to deepen the knowledge on EU interest group population and simultaneously rule out the risk of reverse causality with certainty.

Bibliography

Alexander, R. M., Mazza, S. W. & Scholz, S. (2009). Measuring Rates of Return for Lobbying Expenditures: An Empirical Case Study of Tax Breaks for Multinational Corporations. Journal of Law and Politics, 25(401), 401-457. DOI: http://dx.doi.org/10.2139/ssrn.1375082.

Azqueta-Gavaldon, A., Hirschbühl, D., Onorante, L. & Saiz, L. (2020). Economic policy uncertainty in the euro area: an unsupervised machine learning approach. *European Central Bank: Working Paper Series, 2359*. DOI: http://dx.doi.org/10.2139/ssrn.3516756.

Baumgartner, F. R. & Leech, B. L. (2001). Interest Niches and Policy Bandwagons: Patterns of Interest Group Involvement in National Politics. *The Journal of Politics, 63*(4), 1191–1213. DOI: https://doi.org/10.1111/0022-3816.00106.

Berkhout, J. & Lowery, D. (2008). Counting organized interests in the European Union: a comparison of data sources. *Journal of European Public Policy 15*(4), 489–513. DOI: https://doi.org/10.1080/13501760801996683.

Berkhout, J. (2015). Interest Organization Demography Research in Europe. In D. Lowery, D. Halpin & V. Gray (eds.), *The Organization Ecology of Interest Communities. Interest Groups, Advocacy and Democracy Series*. (pp. 37-60). London, UK: Palgrave Macmillan.

Berkhout, J., Carroll, B. J., Braun, C., Chalmers, A. W., Destrooper, T., Lowery, D., Otjes, S., & Rasmussen, A. (2015). Interest organizations across economic sectors: explaining interest group density in the European Union. *Journal of European Public Policy, 22*(4), 462-480, DOI: 10.1080/13501763.2015.1008549.

Berkhout, J., Hanegraaff, M. & Braun, C. (2017). Is the EU different? Comparing the diversity of national and EU-level systems of interest organisations. *West European Politics, 40*(5), 1109-1131. DOI: 10.1080/01402382.2017.1308695.

Berkman, M. B. (2001). Legislative Professionalism and the Demand for Groups: The Institutional Context of Interest Population Density. *Legislative Studies Quarterly, 26*(4), 661-679. DOI: 10.2307/440274.

Berry, J. M. (1978). On the Origins of Public Interest Groups: A Test of Two Theories. Polity, 10(3), 379-397. DOI: https://doi.org/10.2307/3234414.

Beyers, J., Eising, R. & Maloney, W. (2008). Researching Interest Group Politics in Europe and Elsewhere: Much We Study, Little We Know? *West European Politics, 31*(6), 1103-1128. DOI: 10.1080/01402380802370443.

Bouwen, P. (2002). Corporate lobbying in the European Union: the logic of access. *Journal of European Public Policy 9*(3), 365-390. DOI: 10.1080/13501760210138796.

Bouwen, P. (2004). Exchanging Access Goods for Access: A Comparative Study of Business Lobbying in the European Union Institutions. European Journal of Political Research, 43(3), 337–69. DOI: https://doi.org/10.1111/j.1475-6765.2004.00157.x.

Broscheid, A. & Coen, D. (2007). Lobbying activity and fora creation in the EU: empirically exploring the nature of the policy good. *Journal of European Public Policy, 14*(3), 346-365, DOI: 10.1080/13501760701243749.

Bryman, A. (2012). *Social Research Methods* (4th ed.). New York, NY: Oxford University Press.

Bunea, A. & Baumgartner, F. R. (2014). The state of the discipline: authorship, research designs, and citation patterns in studies of EU interest groups and lobbying. *Journal of European Public Policy*, 21(10), 1412-1434. DOI: 10.1080/13501763.2014.936483.

Carroll, G. R. & Hannan, M. T. (1995). Density-Dependent Evolution. In G. R. Carroll and M. T. Hannan, (Eds.), *Organizations in Industry: Strategy, Structure, and Selection*, (pp. 115-120). New York, NY: Oxford University Press.

Carroll, G. R. & Hannan, M. T. (2000). *The Demography of Corporations and Industries*. Princeton, NJ: Princeton University Press.

Chalmers, A.W. (2015). Financial industry mobilization and securities markets regulation in Europe. *European Journal of Political Research, 54*(3), 482-501. DOI: 10.1111/1475-6765.12099.

Chamberlain, A., Yanus, A.B. & Pyeatt, N. (2019). Revisiting the ESA model: a historical test. *International Groups & Advocacy, 8*, 23-43. DOI: https://doi.org/10.1057/s41309-018-00046-5.

De Villiers, R. & Monk, M. (2005). The first cut is the deepest: reflections on the state of animal dissection in biology education. *Journal of Curriculum Studies, 37*(5), 583-600. DOI: 10.1080/00220270500041523.

EESC. (2022). *European Economic and Social Committee: About*. Retrieved from: https://www.eesc.europa.eu/en/about.

EUR-Lex. (2022). *About EUR-Lex*. Retrieved from: https://eur-lex.europa.eu/content/welcome/about.html.

European Commission. (2008). *Transition between NACE Rev. 1.1 and NACE Rev. 2*. Retrieved from: https://ec.europa.eu/eurostat/web/nace-rev2/transition.

European Commission. (2022a). *Europe: Transparency Register*. Retrieved from: https://ec.europa.eu/transparencyregister/public/homePage.do?redir=false&locale=en#en.

European Commission. (2022b). *Have your say*. Retrieved from: https://ec.europa.eu/info/law/better-regulation/have-your-say_en.

European Commission. (2022c). *Europe: Transparency Register: Statistics*. Retrieved from: https://ec.europa.eu/transparencyregister/public/consultation/statistics.do?action=prepareView&locale=en#en.

European Commission. (2022d). *Published Initiatives*. Retrieved from: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives_en?frontEndStage=OPC_LAUNCHED.

European Commission. (2022e). *Register of Commission Expert Groups and Other Similar Entities*. Retrieved from: https://ec.europa.eu/transparency/expert-groups-register/screen/home.

European Commission. (2022f). *Founding agreements*. Retrieved from: https://european-union.europa.eu/principles-countries-history/principles-and-values/founding-agreements_en.

European Parliament. (2021). *The Enlargement of the Union*. Retrieved from: https://www.europarl.europa.eu/factsheets/en/sheet/167/die-erweiterung-der-europaischen-union.

Fisker, H. M. (2013). Density dependence in corporative systems: Development of the population of Danish patient groups (1901–2011). *Interest Groups & Advocacy, 2*(2), 119–138. DOI: 10.1057/iga.2013.4.

Gale, N. K., Heath, G., Cameron, E., Rashid, S. & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology 13*, 117. DOI: https://doi.org/10.1186/1471-2288-13-117.

Gornitzka, A. & Sverdrup, U. (2008). Who consults? The configuration of expert groups in the European union. *West European Politics, 31*(4), 725-750. DOI: 10.1080/01402380801905991.

Graddy, E. A. (1998). Multivariate Regression Analysis in Public Policy and Administration. In: Gerald J. Miller, Marcia Lynn Whicker (eds), *Handbook of Research Methods in Public Administration*. New York, NY: Marcel Dekker.

Gray, V., & Lowery, D. (1994). Interest Group System Density and Diversity: A Research Update. *International Political Science Review, 15*(1), 5–14. DOI: https://doi.org/10.1177/019251219401500101.

Gray, V. & Lowery, D. (1996). *The Population Ecology of Interest Representation*. Ann Arbor, MI: University of Michigan Press.

Gray, V., Lowery, D., Fellowes, M., & Anderson, J. L. (2005). Legislative Agendas and Interest Advocacy: Understanding the Demand Side of Lobbying. *American Politics Research, 33*(3), 404–434. DOI: https://doi.org/10.1177/1532673X04266638.

Greenwood, J. & Young, A.R. (2005). EU interest representation or US-style lobbying? In N. Jabko and C. Parsons (eds.), *With US or against US? European trends in American perspective. The state of the European Union*. (pp. 275-295). Oxford, UK: Oxford University Press.

Greenwood, J. (2007). Organized Civil Society and Democratic Legitimacy in the European Union. *British Journal of Political Science, 37*(2), 333-357. DOI: 10.1017/S0007123407000166.

Gschwend, T., & Schimmelfennig, F. (2007). *Research design in political science: How to practice what they preach*. Basingstoke, UK: Palgrave Macmillan.

Halpin, D., & Jordan, G. (2009). Interpreting Environments: Interest Group Response to Population Ecology Pressures. *British Journal of Political Science, 39*(2), 243-265. DOI: 10.1017/S0007123408000537.

Halpin, D. (2011). Explaining Policy Bandwagons: Organized Interest Mobilization and Cascades of Attention. *Governance, 24*, 205-230. DOI: https://doi.org/10.1111/j.1468-0491.2011.01522.x.

Hannan M. T. & Freeman, J. (1988). Density Dependence in the Growth of Organizational Populations. In G. R. Carroll (ed.), *Ecological Models of Organizations*. (pp. 7-31). Cambridge, MA: Ballinger.

Hanegraaff, M., van der Ploeg, J., & Berkhout, J. (2020). Standing in a Crowded Room: Exploring the Relation between Interest Group System Density and Access to Policymakers. *Political Research Quarterly, 73*(1), 51–64. DOI: https://doi.org/10.1177/1065912919865938.

Harris, P. (2002). *Designing and reporting experiments in psychology* (2nd ed.). Buckingham, PA: Open University Press.

Heo, U. & Hahm, S. D. (2015). Democracy, Institutional Maturity, and Economic Development. *Social Science Quarterly, 96*, 1041-1058. DOI: https://doi.org/10.1111/ssqu.12185.

Hix, S. & Hoyland, B. (2011). *The Political System of the European Union* (3rd ed.). London, UK: Red Globe Press London.

Hofrenning, D. J. B. (1995). Into the public square: Explaining the origins of religious interest groups, *The Social Science Journal, 32*(1), 35-48. DOI: 10.1016/0362-3319(95)90018-7.

Holyoke, T. T. (2021). Changing state interest group systems: replicating and extending the ESA model. *International Groups & Advocacy, 10*, 264–285. DOI: https://doi.org/10.1057/s41309-021-00127-y.

IBM Corp. Released 2021. *IBM SPSS Statistics for Windows (28.0)* [Software]. Armonk, NY, USA: IBM Corp.

Jordan, G., Halpin, D. & Maloney, W. (2004). Defining Interests: Disambiguation and the Need for New Distinctions? *The British Journal of Politics & International Relations, 6*, 195-212. DOI: https://doi.org/10.1111/j.1467-856X.2004.00134.x.

Junk, W. M., Crepaz, M., Hanegraaff, M., Berkhout, J. & Aizenberg, E. (2021). Changes in interest group access in times of crisis: no pain, no (lobby) gain. *Journal of European Public Policy*, DOI: 10.1080/13501763.2021.1968936.

Kanol, D. (2015). Comparative lobbying research: advances, shortcomings and recommendations. *Journal of Public Affairs, 15*, 110– 115. DOI: 10.1002/pa.1527.

Karantka-Murray, M. (2010). Work and health: Curvilinearity matters. In J. Houdmont & S. Leka (eds.), *Contemporary occupational health psychology: Global perspectives on research and practice*. (pp. 151-168). DOI: https://doi.org/10.1002/9780470661550.ch8.

Kellstedt, P. & Whitten, G. (2018). *The Fundamentals of Political Science Research*. Cambridge, UK: Cambridge University Press.

KfW. (2021). *Annual Report*. Retrieved from: https://www.kfw.de/About-KfW/Service/Download-Center/Financial-Publications/Gesch%C3%A4ftsbericht/.

Klüver, H. & Zeidler, E. (2019). Explaining Interest Group Density Across Economic Sectors: Evidence from Germany. *Political Studies, 67*(2), 459–478. DOI: https://doi.org/10.1177/0032321718774685.

Lack, D. (1947). *Darwin’s Finches*. Cambridge, UK: Cambridge University Press.

LaPira, T. M. (2014). Lobbying after 9/11. *Policy Studies Journal, 42*, 226-251. DOI: https://doi.org/10.1111/psj.12057.

Lehnert, M., Miller, B. & Wonka, A. (2007). Increasing the Relevance of Research Questions: Considerations on Theoretical and Social Relevance in Political Science. In T. Gschwend and F. Schimmelfennig (Eds.), *Research Design in Political Science: How to Practice What They Preach* (pp. 21-33). Basingstoke, UK: Palgrave.

Lowery, D. & Gray, V. (1995). The Population Ecology of Gucci Gulch, or the Natural Regulation of Interest Group Numbers in the American States. *American Journal of Political Science, 39*(1), 1–29. DOI: https://doi.org/10.2307/2111755.

Lowery, D. & Gray, V. (1998a). The Dominance of Institutions in Interest Representation: A Test of Seven Explanations. *American Journal of Political Science, 42*(1), 231–255. DOI: https://doi.org/10.2307/2991754.

Lowery, D., & Gray, V. (1998b). Representational Concentration and Interest Community Size: A Population Ecology Interpretation. *Political Research Quarterly, 51*(4), 919–944. DOI: https://doi.org/10.2307/449111.

Lowery, D., Gray, V., & Fellowes, M. (2005). Sisyphus Meets the Borg: Economic Scale and Inequalities in Interest Representation. *Journal of Theoretical Politics, 17*(1), 41–74. DOI: https://doi.org/10.1177/0951629805047798.

Lowery, D. & Gray, V. (2015). An Introduction to the Population Ecology Approach. In D. Lowery, D. Halpin & V. Gray (eds.), *The Organization Ecology of Interest Communities. Interest Groups, Advocacy and Democracy Series*. (pp. 1-15). London, UK: Palgrave Macmillan.

Lowery, D., Gray, V., & Cluverius, J. (2015). Temporal Change in the Density of State Interest Communities: 1980 to 2007. *State Politics & Policy Quarterly, 15*(2), 263–286. DOI: https://doi.org/10.1177/1532440015574477.

Mahoney, C. (2008). *Brussels versus the Beltway: Advocacy in the United States and the European Union*. Washington, D.C.: Georgetown University Press.

Mazey, S. & Richardson, J. (2005). Interest groups and EU policy-making. Organisational logic and venue shopping. In J. Richardson (eds), *European Union. Power and policy-making*. (pp. 247-68). Abingdon, UK: Routledge.

McFarland, A. (1991). Interest Groups and Political Time: Cycles in America. *British Journal of Political Science, 21*(3), 257-284. DOI: 10.1017/S0007123400006165.

Messer, A., Berkhout, J., & Lowery, D. (2011). The Density of the EU Interest System: A Test of the ESA Model. *British Journal of Political Science, 41*(1), 161–190. Retrieved from: http://www.jstor.org/stable/41241645.

Mueller, D. C. & Murrell, P. (1986). Interest Groups and the Size of Government. *Public Choice, 48*(2), 125–145. DOI: 10.1007/BF00179727.

Nownes, A. J., & Neeley, G. (1996). Public Interest Group Entrepreneurship and Theories of Group Mobilization. *Political Research Quarterly, 49*(1), 119–146. DOI: https://doi.org/10.2307/449044.

Nownes, A. (2004). The Population Ecology of Interest Group Formation: Mobilizing for Gay and Lesbian Rights in the United States, 1950–98. *British Journal of Political Science, 34*(1), 49-67. DOI: 10.1017/S0007123403000346.

Nownes, A. & Lipinski, D. (2005). The Population Ecology of Interest Group Death: Gay and Lesbian Rights Interest Groups in the United States, 1945–98. *British Journal of Political Science, 35*(2), 303-319. DOI: 10.1017/S0007123405000165.

Nownes, A. J. (2010). Density Dependent Dynamics in the Population of Transgender Interest Groups in the United States, 1964–2005. *Social Science Quarterly, 91*, 689-703. DOI: https://doi.org/10.1111/j.1540-6237.2010.00714.x.

OECD. (2022). *6A. Value added and its components by activity, ISIC rev4*. Retrieved from: https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE6A.

Olson, M. (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.

Olson, M. (1982). *The Rise and Decline of Nations*. New Haven, CT: Yale University Press.

Philip, A. B. (1985). *Pressure Groups in the European Community*. London, UK: University Association for Contemporary European Studies.

Politico. (2013). *'Gucci Gulch': Go-to on tax reform*. Retrieved from: https://www.politico.com/story/2013/10/gucci-gulch-tax-reform-098026.

Politico. (2020). *EU lobby register falls short of transparency demands*. Retrieved from: https://www.politico.eu/article/eu-lobby-register-falls-short-of-transparency-demands/.

Publications Office of the European Union. (2022). *Secretariat-General: Transparency Register*. Retrieved from: https://data.europa.eu/data/datasets/transparency-register?locale=en.

Rasmussen, A. & Carroll, B. (2014). Determinants of Upper-Class Dominance in the Heavenly Chorus: Lessons from European Union Online Consultations. *British Journal of Political Science, 44*(2), 445-459. DOI: 10.1017/S0007123412000750.

Rasmussen, A., Carroll, B. J. & Lowery, D. (2014), Representatives of the public? Public opinion and interest group activity. *European Journal of Political Research, 53*, 250-268. DOI: https://doi.org/10.1111/1475-6765.12036.

Real, L. & Brown, J. H. 1991. *Foundations of Modern Ecology*. Chicago, IL: University of Chicago Press.

Rosenzweig, M. L. & Winakur, J. (1969). Population Ecology of Desert Rodent Communities: Habitats and Environmental Complexity. *Ecology, 50*, 558-572. DOI: https://doi.org/10.2307/1936246.

Salisbury, R. H. (1969). An Exchange Theory of Interest Groups. *Midwest Journal of Political Science, 13*(1), 1–32. DOI: https://doi.org/10.2307/2110212.

Salisbury, Robert. 1992. *Research on Interest Groups*. Presented at the Annual Meeting of the American Political Science Association. Chicago, IL.

Sale, J. E., M., Lohfeld, L. H., & Brazil, K. (2002). Revisiting the Quantitative-Qualitative Debate: Implications for Mixed-Methods Research. *Quality and Quantity, 36*(1), 43-53. DOI: http://dx.doi.org/10.1023/A:1014301607592.

Schmitter, P. C. & Streeck, W. (1999). The organization of business interests: Studying the associative action of business in advanced industrial societies. *MPIfG Discussion Paper 99*/1, Max Planck Institute for the Study of Societies. Retrieved from: https://www.econstor.eu/bitstream/10419/43739/1/268682569.pdf.

Sprenger, J. M., & Reiss, J. (2014). Scientific Objectivity. In E. Zalta (Ed.), *Stanford Encyclopedia of Philosophy* (2014 ed.) http://plato.stanford.edu/entries/scientific-objectivity/.

Teixeira, N., Helpdesk at the Publications Office of the EU, email communication, May 05, 2022.

Thomas, C. S. (2004). Introduction: The Study of Interest Groups. In C. S. Thomas (ed.), *Research Guide to U.S. and International Interest Groups* (1st ed., pp. 1-20). Westport, CT: Praeger.

Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation, 27*(2), 237–246. DOI: https://doi.org/10.1177/1098214005283748.

Truman, D. B. (1951). *The governmental process*. New York, US: Alfred A. Knopf.

Unger, B. & Van Waarden, F. (1999). Interest associations and economic growth: a critique of Mancur Olson's Rise and Decline of Nations. *Review of International Political Economy, 6*(4), 425-467, DOI: 10.1080/096922999347128.

Vassalos, Y. (2008). *Secrecy and corporate dominance - a study on the composition and transparency of European Commission Expert Groups*. The Alliance for Lobbying Transparency and Ethics Regulation in the European Union. Retrieved from: https://corporateeurope.org/en/power-lobbies/2008/07/secrecy-and-corporate-dominance.

Verheyden, M., Glidden, J., & Shahin, J. (2013). *DG CONNECT’s Stakeholder Engagement Strategy*. Vrije Universiteit Brussel: Policy brief. Retrieved from: https://hdl.handle.net/11245/1.393976.

Walker, J. L. (1983). The Origins and Maintenance of Interest Groups in America. *American Political Science Review, 77*(2), 390–406. DOI: https://doi.org/10.2307/1958924.

Walker, J. L. (1991). *Mobilizing interest groups in America: Patrons, professions, and social movements*. Ann Arbor, MI: University of Michigan Press.

Westmarland, N. (2001). The Quantitative/Qualitative Debate and Feminist Research: A Subjective View of Objectivity. *Forum: Qualitative Social Research, 2*(1). DOI: https://doi.org/10.17169/fqs-2.1.974.

Wilson, E. O. (1992). *The Diversity of Life*. Cambridge, MA: Harvard University Press.

Wonka, A., Baumgartner, F. R., Mahoney, C., & Berkhout, J. (2010). Measuring the size and scope of the EU interest group population. *European Union Politics, 11*(3), 463–476. DOI: https://doi.org/10.1177/1465116510369267.

Yilmaz, K. (2013). Comparison of Quantitative and Qualitative Research Traditions: epistemological, theoretical, and methodological differences. *European Journal of Education, 48*(2), 311-325. DOI: https://doi.org/10.1111/ejed.12014.

Appendices

Appendix A

Data of the dependent and independent variables per field of interest

	Dependent Variable	Independent Variables			
Fields of Interest	**Density**	**Turnover (Mean)**	**Legislative Acts**	**Adopted Consultations**	**Expert Groups**
Agriculture and rural development	3124	100,224,764	567	4	44
Banking and financial services	2112	231,461,502.6	78	21	12
Borders and security	1655	99,088,630.16	259	0	2
Budget	1748	246,866,759	69	4	3
Business and industry	5287	142,399,491.7	94	0	49
Climate action*	6032	128,527,989.3	180	11	19
Communication	2337	94,157,963.36	71	4	4
Competition	4426	194,351,489	40	1	3
Consumers	4126	76,595,615.6	433	5	21
Culture*	1965	77,811,946.46	14	4	5
Culture and media	2053	77,763,189.86	121	4	2
Customs	2045	71,707,434.74	141	11	37
Digital economy and society	5322	130,306,293.5	80	9	21
Economy, finance and the euro	3728	163,824,329.3	63	2	12
Education and training*	3994	135,686,721.7	12	4	36
Employment and social affairs	3481	147,987,985.1	63	10	27
Energy	4738	150,663,741.1	53	9	28
Enlargement	1215	200,625,237.8	18	0	3
Environment*	7019	113,359,776.2	180	5	67
European neighbourhood policy	1040	81,165,944.46	215	0	11

External relations	2591	103,067,599.3	730	0	11
Food safety	2959	92,961,925.3	189	8	24
Foreign affairs and security policy	1963	111,707,897.3	164	0	2
Fraud prevention	1080	98,627,287.88	108	0	6
Humanitarian aid and civil protection*	1494	176,289,285.9	29	1	11
Institutional affairs	2657	189,917,460.1	447	12	2
International cooperation and development*	3620	134,724,297.9	180	1	15
Justice and fundamental rights	3103	62,091,213.39	51	15	64
Maritime affairs and fisheries	1637	118,515,812	203	15	18
Migration and asylum*	1092	141,181,821.4	18	9	9
Public health*	3815	116,172,766.8	136	8	35
Regional policy	2833	186,467,874.3	33	7	9
Research and innovation	6387	130,783,123.8	3	2	40
Single market	4818	163,996,100.8	338	3	65
Sport*	855	160,305,105.5	14	4	3
Taxation	3380	174,938,640.7	48	16	20
Trade	4302	155,850,417.7	230	8	13
Trans-European Networks	2959	173,144,372.8	7	15	6
Transport	3576	179,167,199.5	163	18	60
Youth*	2219	117,521,184.6	3	4	5

**Not considered as corporate fields of interest and therefore not included for Model 1.*

Appendix B

Descriptive statistics of the dependent and independent variables

	N	Min.	Max.	Median	Mean	Std.-Dev.
Density	30	1040	6387	2959	3089.40	1374.859
Turnover	30	62,091,213.39	246,866,759	13,6591,307.75	138,347,576.53	49,337,236.887
Legislative Activity	30	3	730	101	169.30	175.055
Adopted Consultation	30	0	21	4.5	6.77	6.252
Expert Groups	30	2	65	12.5	20.63	19.530

Appendix C

Matching between the fields of interest from the Transparency Register and the domains of the Directory of Legal Acts

	Legislative Act	
Field of Interest	Code number	Code name
Agriculture and rural development	03	Agriculture
	02.50.10	In the application of customs or agricultural rules
	02.50.20	For the recovery of claims in customs or agriculture
	06.20.10.10	Agriculture
	13.30.11	Agricultural and forestry tractors
Banking and financial services	06.20.20.20	Banks
	10.20	Monetary policy
	10.40	Free movement of capital
Borders and security	19.10	Free movement of persons
	18	Common Foreign and Security Policy
Budget	01.60	Financial and budgetary provisions
Business and industry	13.10	Industrial policy: general, programmes, statistics and research
	13.20	Industrial policy: sectoral operations
	06.20.30	Business activities
	17.30	Economic and commercial law
Climate action*	15.10	Environment
Communication	13.20.60	Information technology, telecommunications and data-processing
	20.07	Statistics
Competition	08	Competition policy
Consumers	15.20	Consumers

Culture*	16.40	Culture
Culture and media	16.40	Culture
	16.20	Dissemination of information
	13.20.60	Information technology, telecommunications and data-processing
Customs	02	Customs Union and free movement of goods
	11.30.30	Multilateral customs cooperation
	19.30.30	Customs cooperation
Digital economy and society	13.20.60	Information technology, telecommunications and data-processing
	13.10.30	Research and technological development
Economy, finance and the euro	10.30	Economic policy
	15.20.40	Protection of economic interests
Education and training*	16.30	Education and training
Employment and social affairs	05.20	Social policy
Energy	12	Energy
Enlargement	11.50	Action in favour of countries in transition
	02.10.10	Common customs territory
	19.10.10	Elimination of internal border controls
Environment*	15.10	Environment
European neighbourhood policy	11.40.10	European countries
	11.20	European political cooperation
External relations	11	External relations
	19.50	External relations
Food safety	13.30.14	Foodstuffs
	03.60	Products subject to market organisation

Foreign affairs and security policy	18	Common Foreign and Security Policy
Fraud prevention	08.20	Restrictive practices
	15.20.30	Protection of health and safety
	15.20.40	Protection of economic interests
	17.20	Intellectual property law
Humanitarian aid and civil protection*	11.70	Development policy
	05.20.05	General social provisions
Institutional affairs	01.40	Provisions governing the institutions
	10.20.10	Institutional monetary provisions
	10.30.10	Institutional economic provisions
International co-operation and development*	11.30	Multilateral relations
	11.70	Development policy
Justice and fundamental rights	17	Law relating to undertakings
	19.20	Judicial cooperation in civil matters
	19.30	Police and judicial cooperation in criminal and customs matters
Maritime affairs and fisheries	04	Fisheries
	07.30	Shipping
Migration and asylum*	19.10.30	Asylum policy
	05.20.40.20	Application to migrant workers
Public health*	15.30	Health protection
	15.20.30	Protection of health and safety
Regional policy	14	Regional policy and coordination of structural instruments
Research and innovation	16.10	Science

Single market	13.40	Internal market: policy relating to undertakings
	13.30	Internal market: approximation of laws
Sport*	06.20.20.50	Leisure services
	16.40	Culture
Taxation	09	Taxation
Trade	11.60	Commercial policy
	11.30.10	Relations in the context of the General Agreement on Tariffs and Trade (GATT)
Trans-European Networks	13.60	Trans-European networks
Transport	07	Transport policy
Youth*	05.20.05	General social provisions

**Not considered as corporate fields of interest and therefore not included for Model 1.*

Appendix D

Matching between the fields of interest from the Transparency Register and the topics of adopted initiatives by the European Commission

Fields of Interest	**Adopted Consultations: Topics**
Agriculture and rural development	Agriculture and rural development
Banking and financial services	Banking and financial services
Borders and security	Borders and Security
Budget	Budget
Business and industry	Business and Industry
Climate action*	Climate Action
Communication	Statistics
Competition	Competition
Consumers	Consumers
Culture*	Culture and Media
Culture and media	Culture and Media
Customs	Customs
Digital economy and society	Digital Economy and Society
Economy, finance and the euro	Economy Finance and the Euro
Education and training*	Education and Training
Employment and social affairs	Employment and Social Affairs
Energy	Energy
Enlargement	EU Enlargement
Environment*	Environment
European neighbourhood policy	European Neighbourhood Policy
External relations	Foreign Affairs and Security Policy
Food safety	Food Safety
Foreign affairs and security policy	Foreign Affairs and Security Policy
Fraud prevention	Fraud Prevention
Humanitarian aid and civil protection*	Humanitarian Aid and Civil Protection
Institutional affairs	Institutional Affairs
International co-operation and development*	International Cooperation and Development
Justice and fundamental rights	Justice and Fundamental Rights
Maritime affairs and fisheries	Maritime Affairs and Fisheries
Migration and asylum*	Migration and Asylum

Public health*	Public Health
Regional policy	Regional Policies
Research and innovation	Research and Innovation
Single market	Single market
Sport*	Sport
Taxation	Taxation
Trade	Trade
Trans-European Networks	Home Affairs
Transport	Transport
Youth*	Youth

**Not considered as corporate fields of interest and therefore not included for Model 1.*

Appendix E

Matching between the fields of interest from the Transparency Register and policy areas of expert groups

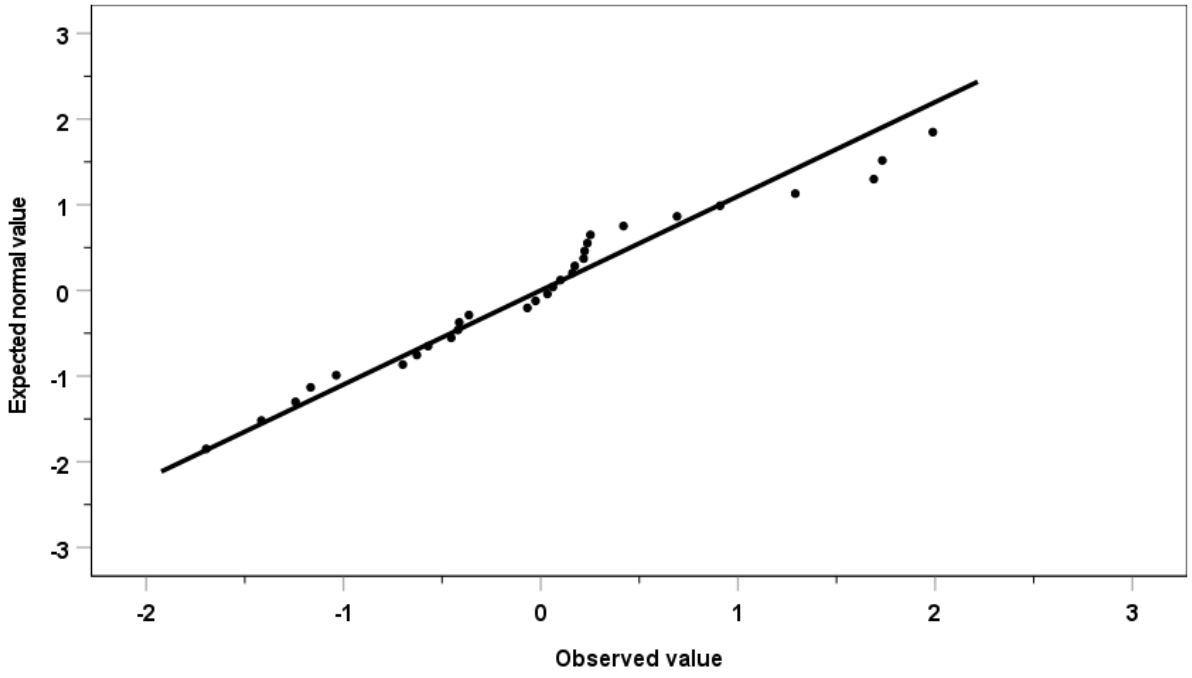
Fields of Interest	**Expert Groups: Group Policy Area**
Agriculture and rural development	Agriculture
Banking and financial services	Economic and Monetary Affairs
Borders and security	Foreign and Security Policy
Budget	Budget
Business and industry	Enterprise
Climate action*	Climate
Communication	Communication
Competition	Competition
Consumers	Consumer affairs
Culture*	Culture
Culture and media	Audiovisual
Customs	Customs
Digital economy and society	Information Society
Economy, finance and the euro	Economic and Monetary Affairs
Education and training*	Education Training
Employment and social affairs	Employment and Social Affairs
Energy	Energy
Enlargement	Enlargement
Environment*	Environment
European neighbourhood policy	External Relations
External relations	External Relations
Food safety	Food Safety
Foreign affairs and security policy	Foreign and Security Policy
Fraud prevention	Fraud prevention
Humanitarian aid and civil protection*	Civil protection Humanitarian aid
Institutional affairs	Institutional affairs
International co-operation and development*	Development
Justice and fundamental rights	Justice and Home Affairs

Maritime affairs and fisheries	Fisheries and Maritime Affairs
Migration and asylum*	Human rights
Public health*	Public Health
Regional policy	Regional Policy
Research and innovation	Research and Innovation
Single market	Internal Market
Sport*	Sport
Taxation	Taxation
Trade	External Trade
Trans-European Networks	Administration
Transport	Transport
Youth*	Youth

**Not considered as corporate fields of interest and therefore not included for Model 1.*

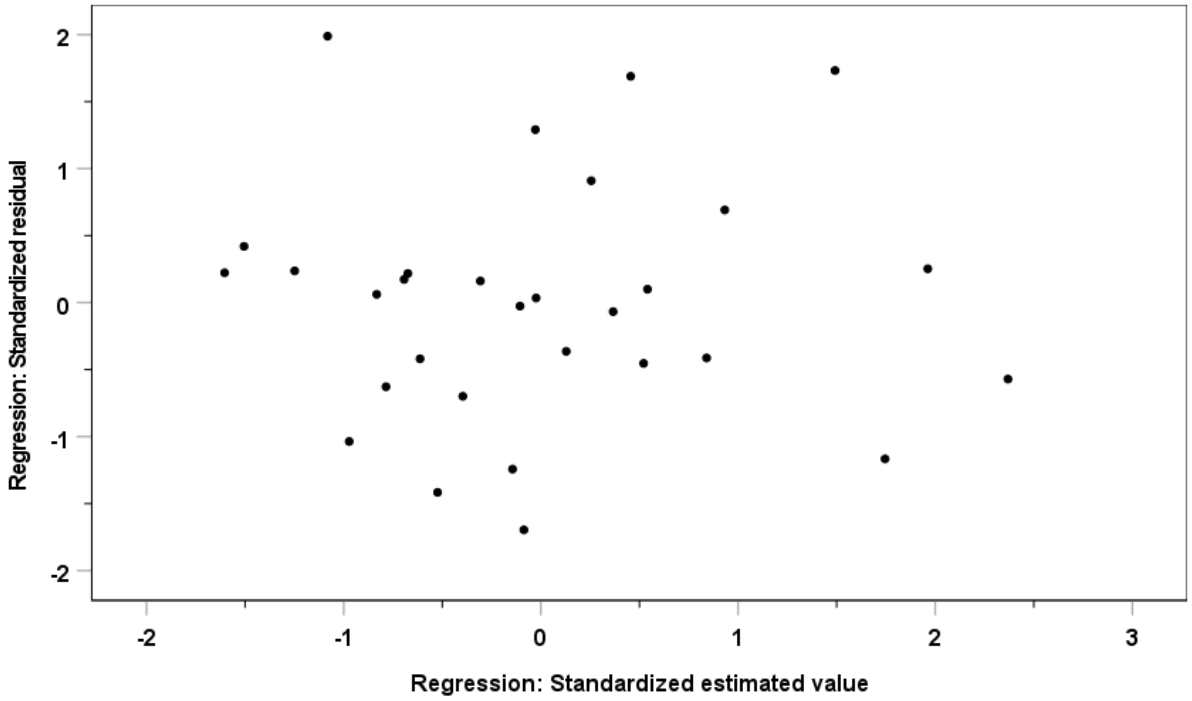
Appendix F

Q-Q-Plot of Standardized Residuals



Appendix G

Residual scatter plot



Appendix H

Correlation matrix of the independent variables

	Squared Constituency	Legislative Activity	Policy Uncertainty	Policy Participation
Constituency	0.302	-0.299	0.247	-0.186
Squared Constituency		-0.116	0.182	-0.170
Legislative Activity			-0.193	0.070
Policy Uncertainty				0.255

* p<0.01