

Informational lobbying in the European Union: Explaining information supply to the European Commission

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Abstract

Information supply is an important instrument through which interest groups can exert influence on political decisions. However, information supply to decision-makers varies extensively across interest groups. How can this be explained? Why do some interest groups provide more information than others? I argue that variation in information supply can largely be explained by organizational characteristics, more specifically the resources, the functional differentiation, the professionalization and the decentralization of interest groups. I test my theoretical expectations based on a large new dataset: Using multilevel modeling, I examine information supply to the European Commission across 56 policy issues and a wide range of interest groups by combining an analysis of consultation submissions with a survey conducted among interest groups.

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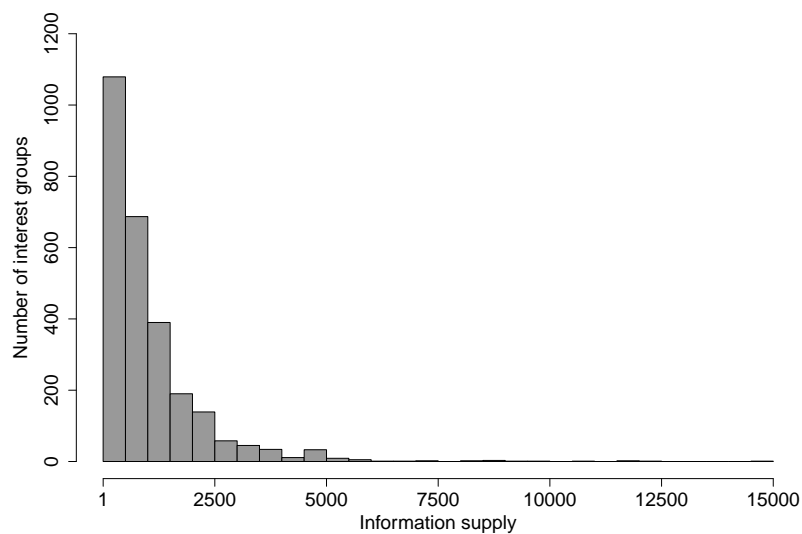
1 Introduction

An essential part of lobbying is the transmission of information to decision-makers. Legislators deal with multiple issues at the same time and modern policy-making becomes increasingly complex. Decision-makers therefore operate in a highly complex and uncertain environment and often find themselves lacking sufficient information to fully comprehend the nature of given policy problems and to foresee the consequences of specific policy measures (Austen-Smith 1993; Lohmann 1993; Bouwen 2009). Interest groups by contrast are concerned with very specific policy areas and are directly in touch with their members who are immediately affected by policies. Interest groups are therefore specialists who dispose of highly specialized expert knowledge and therefore enjoy information advantages over legislators (Hall and Deardorff 2006, 73). As a consequence, decision-makers develop tight networks with interest groups to gain from them policy-relevant information in order to develop policy proposals that constitute a technically appropriate solution to the policy problem at hand and that gain the approval of major stakeholders (Bouwen 2004; Hall and Deardorff 2006). By providing information to legislators, interest groups are able to shape the content of policies as they can filter the information on which decision-makers base their political decisions (Austen-Smith 1993; Lohmann 1993). Accordingly, Austen-Smith (1993, 799f) summarizes the relationship between information supply and interest group influence as follows: “Decision-makers are frequently choosing policies without complete information on their consequences, in which case, information becomes valuable, and those who possess it are accordingly in a position to influence policy”.

The importance of information supply for interest group influence has correspondingly been discussed extensively in the literature (e.g. Potters and van Winden 1990, 1992; Austen-Smith 1993; Lohmann 1995, 1998; Grossman and Helpman 2001; Crombez 2002). It is generally argued that decision-makers need external information and that interest group influence increases with the amount of information they can supply. Whereas the literature is characterized by a wide variety of theoretical models on how information supply affects interest group influence, there are only four empirical studies investigating information supply by interest groups. Bouwen (2004) developed an exchange model of lobbying in the European Union and argued that information supply has a positive effect on interest group influence. He reasoned that information supply changes with actor type (companies, national associations and European associations) and demonstrated that interest group access to the European institutions indeed varies across different types of actors. Eising (2007) similarly found a positive effect of information supply on interest group access in an empirical analysis of lobbying activities of national and European interest groups towards the European institutions. Bernhagen and Bräuninger (2005) furthermore presented a signaling model on strategic information transmission which they

tested based on two case studies and found that information supply indeed plays a crucial role for lobbying success. Finally, Klüver (2011) demonstrated in a large empirical analysis of interest group lobbying towards the European Commission that information supply by lobbying coalitions has a positive effect on the ability of interest groups to influence policy formulation. In conclusion, the theoretical and empirical literature on lobbying agrees that information supply by interest groups is positively associated with lobbying success. Thus, an important prerequisite of effective lobbying is the provision of information to decision-makers.

Figure 1: Histogram of information supply to the European Commission



The supply of information to decision-makers however varies extensively across interest groups. To illustrate this, figure 1 presents a histogram of information supply of 2,696 interest groups to the European Commission concerning the preparation of 56 policy proposals.¹ On average, interest groups supplied 1,016 words to the European Commission. The amount of information supply however ranges from a minimum of 41 to a maximum of 14,632 words with a standard deviation of 1,174 words. Thus, provision of information differs considerably across interest groups. How can this be explained? Why do some interest groups provide more information than others to legislators despite the common aim of influencing policy outcomes? Even though the literature provides a rich body of particularly theoretical studies investigating the effect of information supply on interest group influence, no attention has been paid to the determinants of information provision to decision-makers. In this article, I therefore aim at solving this puzzle by examining information supply to the European Commission. I develop a theoretical framework

¹Further details concerning the selection of interest groups and policy issues as well as regarding the measurement of information supply will be provided in the research design section.

by combining insights of resource mobilization and organizational theory in order to explain why the provision of information varies across interest groups. I then test my theoretical expectations based on a large new dataset that combines an empirical analysis of interest group submissions to consultations launched by the European Commission with a survey conducted among interest groups. Studying information supply to the European Commission is particularly interesting since the Commission enjoys the monopoly of legislative initiative and is therefore solely responsible for policy formulation.² However, despite the increasing competences of the European Union, the European Commission is notoriously understaffed which makes policy formulation a highly challenging task (McLaughlin, Grant and Maloney 1993, 201; Marks and McAdam 1999, 105). Information supply by external actors therefore plays a fundamental role for the preparation of policy proposals by the European Commission (Bouwen 2009, 20).

The article proceeds as follows: I first present the theoretical framework from which I derive hypotheses that explain variation in information supply. I then illustrate the research design of this study before empirically testing the hypotheses. The article concludes with a summary of the results.

2 Theory: Explaining information supply by interest groups

I hypothesize that the ability of interest groups to supply information to decision-makers is largely shaped by the material resources at their disposal and by their internal organizational structure. Below I therefore first discuss the relationship between material resources and information supply. I then proceed to illustrating how the internal organizational structure affects the ability of interest groups to provide policy-relevant information to the European Commission. I argue that particularly three features of the organizational structure have an important effect on information supply: Functional differentiation, professionalization and decentralization (see figure ??).

2.1 Material resources

In order to supply valuable information to the European Commission, interest groups need material resources. The importance of resources for interest group activity has been pointed out by several scholars (e.g. McCarthy and Zald 1977; Knoke and Wood

²This applies to the first pillar of the European Union which is arguably the most important and therefore the focus of this study.

1981; Eising 2007; Klüver 2010a). By material resources I understand the equipment of interest groups with staff and money. Financial and personnel resources are a necessary condition for every interest group to work towards goal attainment (McCarthy and Zald 1977). Interest groups need to acquire a high amount of material resources in order to effectively lobby for their cause and to supply the information required by the European Commission (Mazey and Richardson 1992, 104). Since the institutional environment and the decision-making processes at the European level are highly complex, interest groups need money and staff to monitor what is going in Brussels. In order to find out about new policy initiatives, interest group employees have to participate in consultations, attend formal hearings, take part in working groups and they have to establish informal contacts with decision-makers. To stay informed about policy developments, frequent and regular interactions with Commission officials and other interest groups are necessary so that physical presence in the shape of a Brussels office has proven to be useful. Without any budget or staff, interest groups cannot monitor and participate in EU decision-making. They cannot develop policy expertise and supply information to the European Commission. More generally, McCarthy and Zald (1977) state that “in any case, resources must be controlled or mobilized before action is possible”. Eising (2009, 161) has accordingly argued that material resources are a major prerequisite for interest group activities on the European level. The ability to provide policy-relevant information to the European Commission thus requires sufficient financial and personnel resources. Well-trained personnel have to be employed who monitor the decision-making process, elaborate statements and reports and participate in hearings and consultations. Hence, the following hypothesis can be formulated:

Hypothesis 1:

The more material resources interest groups possess, the higher the amount of policy-relevant information they supply to the European Commission.

2.2 Organizational structure

Following the contingency approach in organizational theory (e.g. Burns and Stalker 1961; Lawrence and Lorsch 1967; Pugh et al. 1968; Blau 1970; Donaldson 2001), I furthermore hypothesize that interest groups have to adapt their internal organizational structure to their environment at the European level in order to be able to deliver the required information. The organizational structure means the formal coordinating mechanisms and interaction patterns that are followed, how tasks are to be allocated and who reports to whom (Robbins 1987, 4). It determines the manner and extent to which roles, powers

and responsibilities are delegated, controlled and coordinated and how information flows between levels of authority. Organizational contingency theory is based on the following assumptions: Organizations are embedded in an environment with which they interact. The internal organizational structure largely determines the efficiency and performance of an organization. However, there is no universally efficient organizational structure. In order to guarantee efficient goal attainment, organizations have to adapt their structures to the environment in which they are embedded. Fit is the key to performance: The higher the fit between the environment and the organizational structure, the higher the efficiency of organizations (Donaldson 1999, 59).

The environment of interest groups aiming at influencing European policy formulation is the institutional context of the European Union and particularly the European Commission. Notably, three features of the institutional setting of the European Union are decisive: Its multilevel character, the fragmentation of powers across its institutions and the high degree of vertical and functional differentiation of the European institutions (Mahoney 2004; Eising 2007). As Marks (1993, 392) states, the political system of the European Union is characterized by

“multilevel governance, a system of continuous negotiation among nested governments at several territorial tiers – supranational, national, regional, and local – as the result of a broad process of institutional creation and decisional reallocation that has pulled some previously centralized functions of the state up to the supranational level and some down to the local/regional level”.

Decision-making authority is therefore not concentrated in the hands of one single entity, but spread across a wide variety of actors at different levels. This institutional environment creates a high amount of uncertainty since it is difficult to oversee policy developments. Environmental change can constantly occur through new policy initiatives that interest groups have to respond to.

Following Burns and Stalker (1961), I argue that interest groups are most efficient in supplying information to the European Commission if they adopt an organic structure which is well-designed for uncertain and turbulent environments. Coordination in organic organizations is assured by horizontal cooperation as well as team elements and leadership status is based on qualification for the task at hand instead of hierarchy. Organic organizational structures therefore encourage flexibility and decentralized decision-making which allows for fast adaptations to environmental changes. Thus, interest groups which are characterized by an organic organizational structure perform well in the uncertain institutional environment of the European Union and are able to quickly respond to environmental changes in the shape of new policy initiatives. I argue that particularly three features of organic organizational structures are important to be able to efficiently supply

information to the European Commission: Functional differentiation, professionalization and decentralization.

Functional differentiation is defined as the division of labor within an organization and the distribution of official duties among a number of positions (Pugh et al. 1968, 72-73). The European institutions are characterized by a high degree of functional differentiation. This is particularly true for the European Commission which is not only vertically differentiated into the College of Commissioners, the Cabinets and the Directorates General (DGs) and Services, but also highly functionally differentiated. Each Commissioner is responsible for its own policy portfolio and is usually supported by a Directorate General which is specialized on his policy domain. In total, the European Commission is divided into forty-four functionally specialized DGs of which twenty-five are responsible for a specific policy field.³ These Directorates General are in turn further differentiated into functionally specialized directorates and units. For instance, DG Enterprise and Industry employs over 1,000 people and is divided into ten directorates and forty-five units.⁴ I expect that interest groups need to adapt their organizational structure according to the functional segmentation of the European Commission in order to effectively monitor decision-making processes within the Commission and to find out about new policy initiatives as early as possible (see also, Mazey and Richardson 1992, 98; Kohler-Koch, Quittkat and Buth 2008, 9). In addition, interest groups are better able to generate special expertise required by the European Commission if employees concentrate on specific policy areas. Employees who focus on one specific policy field become specialists in this area and develop important expert knowledge. Moreover, through frequent interaction with Commission officials working in their policy area they become part of “policy communities” which ensure a constant flow of information and good contacts with Commission officials (Richardson 2000). Thus, interest groups with a high degree of functional differentiation should be better able to monitor the behavior of the European Commission, to notice the emergence of new policy initiatives at early stages and to develop policy-relevant information required by the European Commission. Accordingly, the following hypothesis can be derived:

Hypothesis 2:

The higher the functional differentiation of an interest group, the higher the amount of policy-relevant information it supplies to the European Commission.

Furthermore, I expect that interest groups not only have to functionally differentiate

³Source: http://ec.europa.eu/about/ds_en.htm, last accessed on 30.04.2010. Directorates General which are not responsible for a specific policy domain are for instance the Secretariat General, Eurostat or the Translation DG.

⁴Source: http://ec.europa.eu/enterprise/dg/index_en.htm, last accessed on 30.04.2010.

so that employees can concentrate on one particular policy area or subfield, but that they also have to employ people who are highly qualified for the challenging lobbying task. I accordingly expect that the degree of professionalization of interest groups is positively correlated with the amount of information provided to the European Commission (Hage and Aiken 1967). Professionalization is defined as the creation of positions which require a high degree of qualification in terms of educational training and professional experience (Kubicek and Welter 1985, 1096). Due to the complexity of European decision-making processes and the high amount of policy expertise demanded by the European Commission, it is important that interest groups rely on well-trained personnel rather than on unqualified volunteers. Lobbying is a challenging full-time job which requires constantly watching the policy developments at the European level and to build up extensive networks with Commission officials and other interest groups. In addition, in order to be able to supply valuable information to the European Commission, interest group representatives need to have legal and policy expertise as well as a good understanding of the complex institutional environment at the European level.

In a more general manner, Wright, McMahan and McWilliams (1994, 314) argue that there is a strong linear relationship between personal abilities of employees and their job performance. Accordingly, organizations which are highly professionalized should possess relative performance advantages over competitors. This is particularly true for dynamic and complex environments since highly qualified employees have a greater capacity to adapt to environmental changes (Wright, McMahan and McWilliams 1994, 315). I argue accordingly that employing highly qualified individuals enables interest groups to increase their monitoring capability by decentralizing the monitoring task to meet the complexity of the institutional environment of the EU. Monitoring does not have to be coordinated by a central authority, but information about environmental changes can be gathered by employees who are closer to the Commission officials who prepare new policy initiatives. Highly qualified employees are moreover flexible and adaptable which enables them to respond to new policy initiatives in a time-efficient manner (Wright, McMahan and McWilliams 1994, 316). I therefore expect that professionalization of employees is an important source of competitive advantage of interest groups over competing lobbying actors (Wright, McMahan and McWilliams 1994). The knowledges, skills and abilities inherent in the individuals working for an interest group play an important role in understanding why some interest groups supply more policy-relevant information than others. The following hypothesis can accordingly be derived:

Hypothesis 3:

The higher the professionalization of an interest group, the higher the amount of policy-relevant information it supplies to the European Commission.

Another important organizational feature which positively affects information supply to the European Commission is the degree of decentralization (Hage and Aiken 1967). Whereas functional differentiation allows employees to become specialists in a concrete policy area and professionalization ensures that employees are highly qualified for the job, decentralization grants them discretion to make autonomous decisions which enables interest groups to quickly adapt to environmental changes. Centralization concerns the locus of authority to make decisions affecting the organization (Pugh et al. 1968, 304). In highly centralized organizations, the authority to make decisions is concentrated in the hands of the organization's leadership. Highly decentralized organizations are by contrast characterized by horizontal participatory decision-making modes involving a large number of people. Since changing policy proposals once they have been passed to the European Parliament or the Council is difficult, interest groups need to react immediately to new policy initiatives since information only ensures influence if provided quickly. As illustrated before, the complex institutional setting of the European Union however creates a high degree of uncertainty for interest groups. Interest groups can therefore not plan ahead, but have to quickly respond to new policy initiatives which are initiated by the European Commission. Oftentimes, interest groups only become aware of an upcoming policy proposal shortly before it is adopted by the European Commission. Hence, activities cannot be scheduled in advance, but have to be organized on short notice.

Interest groups therefore have to deal with the turbulent and uncertain environment with a decentralized decision-making structure. They have to utilize diverse bodies of expertise through granting discretion to their employees (Donaldson 1999, 53). Employees need to have the authority to make autonomous decisions to respond quickly to new policy developments. Interest groups cannot rely on hierarchical control of staff since the appropriate expertise might be located at lower levels of the hierarchy. The interest group leadership cannot prespecify activities in advance since this would require knowledge that the leadership does not possess. Accordingly, Donaldson (1999, 53) states that it is a core assumption of contingency theory that a high degree of environmental uncertainty requires low hierarchies and instead needs participatory and communicative structures. In order to supply a large amount of information in a timely manner, interest groups therefore have to allow their employees discretion and encourage them to use their initiative. The coordination of activities should not be hierarchically organized, but should be conducted horizontally by discussions between employees at different levels. Employees need to be able to make autonomous decisions to quickly provide information to the European Commission. Hence, in order to be able to meet the Commission's demand for policy-relevant information, interest groups have to decentralize their internal organizational structure. The following hypothesis can therefore be formulated:

Hypothesis 4:

The higher the decentralization of an interest group, the higher the amount of policy-relevant information it supplies to the European Commission.

3 Research design

In this section, I illustrate how I constructed the dataset that was used to test the hypotheses. I first explain how I operationalized the dependent variable information supply. I then discuss how I selected the policy issues and interest groups for the empirical analysis. Finally, I illustrate the measurement of the explanatory and control variables.

Information supply was measured by the number of words contained in interest group submissions to online consultations conducted by the European Commission. Before the Commission adopts its final policy proposal which is then submitted to the Council and the European Parliament, it releases a preliminary position paper summarizing the intended measures. The Commission then invites interest groups to submit comments on this position paper before it decides about the final legislative proposal. These consultations are conducted for all major policy initiatives (European Commission 2002) and since the introduction of the online consultation instrument in 2000, the Commission conducted 535 consultations until October 2008 thereby providing scholars with a rich new data source (Quittkat and Finke 2008, 20). Thus, using online consultations, it is possible to examine the amount of information concerning a specific policy proposal that is provided by interest groups to the European Commission. Even though online consultations do not constitute the only channel through which interest groups lobby the Commission, it represents the easiest way to get access to the Commission and therefore most interest groups aiming at influencing policy formulation should be covered by the analysis. Accordingly, a wide variety of actors indeed participates in online consultations, e.g. business associations, individual companies and NGOs of international, European, national and subnational origin (Quittkat and Finke 2008). I removed text passages from the interest group submissions that do not convey any information to the Commission in order to improve the accuracy of this proxy. More precisely, I deleted stopwords, repetitions of consultation questions and contact details of interest groups before counting the number of words per interest group submission.

The selection of policy issues and interest groups proceeded in two steps: I first selected 56 policy proposals issued by the European Commission and then gathered information about all interest groups that submitted comments to consultations that the Commission

conducted before the final adoption of these proposals. These policy proposals were selected according to five criteria: All policy proposals were adopted between 2000 and 2008 and fall under the first pillar of the European Union. To avoid variation in informational supply due to the potential impact of a legislative act, I only concentrated on proposals for directives and regulations which are generally binding. I furthermore only selected legislative proposals that were adopted under Codecision or Consultation in order to control for the legislative procedure. Fifth, all proposals in the sample were preceded by online consultations to control for political importance of the proposals and to be able to draw on interest group submissions for the analysis of information supply.⁵

Applying these criteria to the European Commission database *Prelex*, I arrived at a sample of 70 legislative proposals. However, since the data collection was conducted within the framework of a larger research project on interest group influence on policy formulation in the European Union, 16 of these proposals had to be furthermore excluded from the sample so that 56 policy proposals remain for the analysis (for the larger research project, see Klüver 2009, 2010*b*, 2011).⁶ The selection of interest groups was based on their participation in consultations preceding the adoption of the 56 selected legislative proposals. I gathered submissions from 2,043 associations and 653 companies so that the analysis of information supply is based on 2,696 interest groups and 56 policy issues.⁷ The sample of interest groups that was selected for this study corresponds in various characteristics to (a) the entire population of interest groups which are actively lobbying on the European level and (b) the population of actors who participated in the selected consultations (Quittkat and Finke 2008; ?; Wonka et al. 2010). Accordingly, there is no indication of selection bias and the selected sample can therefore be considered as approximately representative.

The explanatory variables were measured by a web survey conducted among the interest groups that participated in the selected consultations. The survey was online from June 2009 to January 2010 and the response rate is 38.67 per cent. In order to make it as easy as possible for respondents to fill in the questionnaire, I mostly refrained from using open questions and instead used closed questions with given answer categories so that

⁵I hereby only concentrated on publicly accessible and non-standardized consultations.

⁶As interest group influence in the broader research project was measured by applying quantitative text analysis to compare the policy positions of the Commission before and after the consultation with the policy preferences of interest groups, I had to exclude six proposals since the Commission did not publish any position paper before the consultation and two further policy proposals were removed since less than ten interest groups submitted comments and such a low number of documents does not suffice to conduct a quantitative text analysis (Slapin and Proksch 2008; Proksch and Slapin 2009, 2010). Furthermore, I had to exclude six further Commission proposals for a number of other reasons.

⁷All together, the European Commission received 3,418 comments from interest groups concerning the 56 selected proposals of which 722 were excluded as they were either not written in English or as they contained less than 100 words which made it impossible to apply quantitative text analysis to them in the broader research project.

respondents simply had to tick the appropriate category. Most questions were measured on a five point ordinal scale which allows for enough variation necessary for the final data analysis and at the same time does not overburden the cognitive abilities of respondents (Cox 1980).

Resources were operationalized by the number of employees concerned with lobbying. The number of employees is a commonly used indicator for the resources of an interest group since interest groups often refuse to answer questions concerning the amount of lobbying expenses or the size of the budget directly (e.g. Beyers and Kerremans 2007; Mahoney 2008).⁸ Indicators for the measurement of functional differentiation, professionalization and centralization are largely based on previous empirical studies in organizational research (e.g. Blau, Heydebrand and Stauffer 1966; Pugh et al. 1968; Pennings 1973; Pugh and Hickson 1976). *Functional differentiation* was measured by the number of organizational units which deal with lobbying. An organizational unit is defined as at least one employee devoting half his working-time to a function or subject within the broader task of lobbying. *Decentralization* was measured by the number of people involved in deciding on the interest group's policy position concerning a new policy initiative of the European Commission. *Professionalization* was measured by three indicators: Education level of staff, frequency of additional training offered by interest groups and length of prior working experience of interest groups' employees. Education level was measured by asking interest groups to indicate the highest degree of education of their employees in percentages of the total number of employees that are concerned with lobbying. In order to make the operationalization of education level comparable to the other professionalization indicators, I transformed this measure into an interval-scaled variable ranging from 1 to 5 by multiplying the PhD percentage times 5, the Master percentage times 4, the Bachelor percentage times 3 the A-Levels percentage times 2 and the less than A-Levels percentage times 1 and then summing up these values and dividing them by 100. Frequency of additional training was measured by asking interest groups how often they offer additional training to their employees and length of prior working experience was measured by the number of years of prior working experience. In order to arrive at one single measure for professionalization, I conducted a principal component factor analysis based on these three indicators.⁹ I then computed principal component factor scores which constitute a single measure of the underlying latent variable "professionalization" that is used in the final data analysis.

⁸Accordingly, whereas information on the number of employees is available for 1,024 interest groups in the sample, information on the lobbying expenses is only available for 868 interest groups and information on the overall budget is only available for 880 interest groups. All three indicators however correlate highly (on average at 0.58) and a factor analysis based on all three indicators confirms that they measure the same underlying latent variable.

⁹According to the Kaiser criterion, these three indicators measure the same underlying factor since the Eigenvalue is above 1.

Finally, I included complexity of policy issues, salience of issues to interest groups and whether there was already prior legislation on the EU level as control variables in the analysis. The *complexity* of a policy issue was measured by three indicators: The number of articles, the number of recitals and the number of words of a legislative proposal (see also Franchino 2000; Kaeding 2006; Steunenberg and Kaeding 2009). I then conducted a principal component factor analysis to compute one single measure for complexity.¹⁰ Since it is plausible to expect that interest groups are more likely to provide more information if a policy issue is very important to them, I also controlled for the salience of a policy issue to an interest group. *Salience* was measured by a survey question asking interest groups about the importance they attach to policy issues they were lobbying on. Whether the policy proposal constitutes new legislation or whether there was already a European level *status quo* was assessed by drawing on the EU database *EurLex* which indicates for every policy proposal whether it is a modification to prior EU legislation. Figure 1 presents summary statistics for the dependent and independent variables. Note that complexity and existence of a status quo are measured at the issue level and can therefore only vary across policy issues (n=56).

Table 1: Summary statistics of variables

Variable	N	Mean	Standard deviation	Minimum	Maximum
Information supply	2,696	1,016.268	1,174.089	41	14,632
Resources	1,024	1.766	1.104	1.000	5.000
Functional differentiation	1,011	1.767	1.022	1.000	5.000
Professionalization	892	0.013	0.890	-3.902	2.724
Decentralization	978	2.462	1.237	1.000	5.000
Salience to interest group	778	4.003	1.090	1.000	5.000
Complexity	56	0.000	1.000	-0.962	3.154
Existence of EU status quo	56		Yes: 67.86%, No: 32.14%		

4 Data analysis

In the following, I empirically test the hypotheses specified in the theory section. The dataset is hierarchically structured as lobbying takes place concerning specific policy proposals and interest groups are therefore clustered into policy issues. In order to take the hierarchical nature of the data into account, I employ multilevel modeling to test the hypothesized relationships. This is necessary since information supply varies considerably across policy issues. For instance, on highly complex issues interest groups might on average provide a very large amount of information. By contrast, on very simple policy

¹⁰According to the Kaiser criterion, the factor analysis retained only one factor according as the Eigenvalues is higher than 1.

issues, interest groups might on average supply only a very small amount of information. As stated previously, the dependent variable “information supply” was measured by the number of words of consultation comments submitted by interest groups. It is a non-negative, integer-valued variable which is highly skewed to the right (see figure 1). Applying a linear regression model to this outcome variable could result in inefficient, inconsistent and biased estimates (Long and Freese 2006, 349). Due to the special character of the dependent variable, I therefore estimated multilevel poisson regression models to test the hypothesized effects.¹¹

Table 2: Missing values in the information supply analysis

Variables	Missing values	
	Original sample (n=2,696)	Without unit non-response (n=1,170)
Functional differentiation	62.50%	13.59%
Resources	62.02%	12.56%
Decentralization	63.72%	16.41%
Professionalization	66.91%	23.76%
Salience to interest group	71.14%	33.50%

The analysis of information supply however suffers from a high number of missing values on the explanatory variables (see table 2). In order to deal with missing values, one can draw on two different strategies which show little or no bias (Allison 2000): Listwise deletion and multiple imputation. Listwise deletion excludes all observations which have missing values on at least one of the variables in the model. It can be conducted without concerns if data is missing completely at random which means that the dataset that is reduced by cases with missing values is a random subset of the original sample (Rubin 1976). Multiple imputation by contrast consists of three steps: First, missing values are filled up by suitable imputation m -times to create m copies of the dataset. Second, each of these m datasets is analyzed separately using complete data methods. Third, the results of these separate analyses are combined according to certain rules specified by Rubin (1987). Since multiple imputation should be avoided for variables that have 50 per cent or more missing values (Royston 2004, 240) and since the distribution of variables in the original sample (n=2,696) largely corresponds to the listwise deletion sample (n=699) indicating that the listwise deletion sample is a random sample of the original sample, I employ listwise deletion to estimate the multilevel models.

Table 3 presents the results of the multilevel poisson regression analysis. The first column

¹¹Poisson regression might suffer from overdispersion. However, to my knowledge there is so far no statistical test that checks for overdispersion in multilevel models. In order to test whether the results hold when using a negative binomial multilevel regression that addresses potential overdispersion, I tried to estimate such a model using the recently developed *R* package *glmmADMB* which is to my knowledge the only statistical package that can currently estimate multilevel negative binomial models. The algorithm however failed to estimate the model.

contains the results of the empty model which is presented in order to evaluate the fit of the other models. The likelihood ratio test examining whether multilevel poisson regression should be preferred over ordinary poisson regression is highly significant. The clustering of lobbying activities of interest groups into issues therefore requires the use of multilevel modeling in order to analyze variation in information supply.

Table 3: Multilevel poisson regression explaining information supply (listwise deletion)

Variables	Empty Model	Without controls	With controls
Fixed effects			
INTEREST GROUP CHARACTERISTICS			
Resources		1.064*** (0.002)	1.075*** (0.002)
Functional differentiation		1.043*** (0.002)	1.040*** (0.002)
Professionalization		1.046*** (0.001)	1.037*** (0.001)
Decentralization		1.103*** (0.001)	1.098*** (0.001)
CONTROL VARIABLES			
Salience to interest group			1.180*** (0.002)
Complexity			1.307*** (0.084)
Existence of EU status quo			1.181 (0.160)
Random effects			
Issue level variance	0.326	0.312	0.223
Model fit			
N	699 / 56	699 / 56	699 / 56
Deviance	423779	404217	386876
AIC	423783	404229	386894
BIC	423792	404256	386935
LR Test, Prob > Chi2		0.000	0.000

*** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$, coefficients represent incidence-rate ratios, standard errors in parentheses, the reference model for the likelihood ratio test is the model left of the model in question, Likelihood ratio test vs. poisson regression: Prob > Chi2 = 0.000

The second column of table 3 shows the results of the multilevel poisson regression model testing the theorized effects. All explanatory variables have a statistically significant positive effect on information supply to the European Commission as hypothesized in the theoretical framework. The coefficients represent incidence rate ratios which are interpreted similar to odds ratios. A value above one indicates a positive effect whereas a value below one indicates a negative effect. The endowment with resources has a statistically significant positive effect on information supply by interest groups. A one unit increase in resource endowment leads to an increase in expected information supply to the European Commission by 6.4 per cent. Hence, the higher the resources of

interest groups, the higher on average the amount of information they supply. Functional differentiation also has the hypothesized positive effect on information supply to the European Commission. As functional differentiation rises by one unit, the expected information supply increases on average by 4.3 per cent. Accordingly, interest groups which are characterized by a high degree of functional differentiation, are on average supplying a higher amount of information to the European Commission than interest groups characterized by a low degree of functional differentiation. Professionalization has a similar effect on information supply by interest groups. A one unit rise in the degree of professionalization is associated with a 4.6 per cent increase in expected information supply. Thus, the higher the professionalization of interest groups, the higher on average the amount of information they provide to the European Commission. The results also suggest that decentralization has a statistically significant positive effect on information supply. A one unit rise in the degree of decentralization is associated with an increase in expected information supply by 10.3 per cent. Hence, interest groups which are characterized by a high degree of internal decentralization, supply on average more information to the European Commission than interest groups which are highly centralized. The inclusion of the explanatory variables has significantly improved the fit of the multilevel model. According to all model fit measures, the model including the explanatory variables should be clearly preferred over the variance decomposition model without any predictors. Hence, resources and the organizational structure can indeed explain variation in information supply to the European Commission as expected in the theoretical framework.

The third model includes three additional control variables, namely salience of policy issues to interest groups, complexity of policy issues and whether there already exists prior legislation on the European level. As the importance of a policy issue to interest groups rises by one unit, the expected information supply increases by 18.0 per cent. Thus, interest groups that consider a policy issue as very important, provide on average more information to the European Commission than interest groups who attach only marginal importance to an issue. Similarly, complexity of policy issues also has a statistically significant positive effect on information supply. A one unit increase in the degree of complexity of a policy issue leads to a rise in expected information supply by 30.7 per cent. Hence, the higher the importance of policy issues to interest groups and the higher the complexity of policy issues, the higher on average the amount of information interest groups provide to the European Commission. The existence of prior European legislation by contrast does not have a statistically significant effect on information supply. The inclusion of the control variables also has improved the overall fit of the model. According to all model fit measures, the third model has the highest explanatory power.

In order to further illustrate the effects in a more reader-friendly manner, I simulated predicted word counts and first differences together with their appropriate degrees of uncertainty. Figure 2 plots the predicted word counts of information supply when (a) resource endowment and (b) functional differentiation vary from their minimum value (1) to their maximum value (5) while all other variables are held at their means. The solid lines represent the point estimates of the predicted information supply in number of words and the dashed lines indicate a 95 per cent confidence interval reflecting the uncertainty of the point estimates. As evident in figure 2 (a) the predicted information supply steadily increases with a rise in resource endowment. Hence, the more resources interest groups possess, the higher the predicted information supply to the European Commission. Similarly, functional differentiation also has a steady although somewhat lower positive effect on information supply as displayed in figure 2 (b).

Figure 2: Effects of resources and functional differentiation on information supply

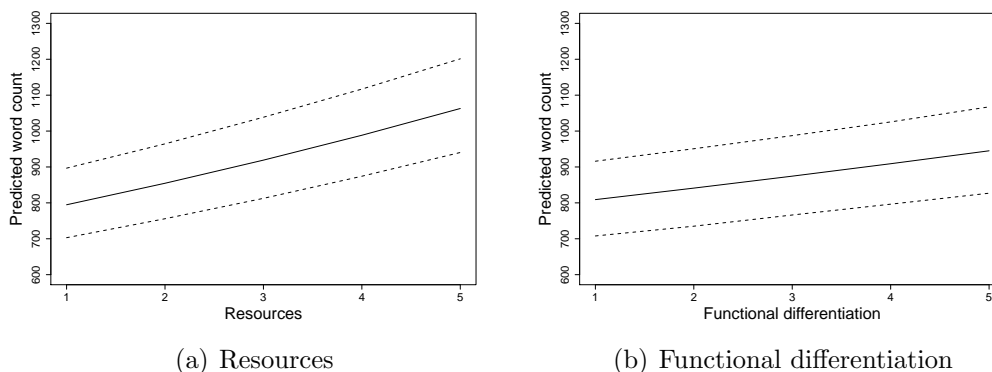


Figure 3 presents the predicted information supply in number of words when (a) professionalization and (b) decentralization vary from their minimum value to their maximum value while holding all other variables at their means.¹² As hypothesized in the theoretical framework, professionalization has a positive effect on information supply: Across the full range of possible values of professionalization, the predicted information supply steadily increases with a rise in the degree of professionalization. The same is true for decentralization. An increase in the degree of decentralization is associated with a higher value of predicted information supply across the entire range of possible values.

In order to further illustrate the size of these effects, I simulated first differences to demonstrate how the predicted information supply changes when resources and organizational characteristics are altered while holding other variables at their means.

¹²As explained in the preceding section, professionalization is measured by a principal component score based on three indicators: Level of education, frequency of additional training and professional experience of employees. It ranges from -3.902 to 2.724.

Figure 3: Effects of professionalization and decentralization on information supply

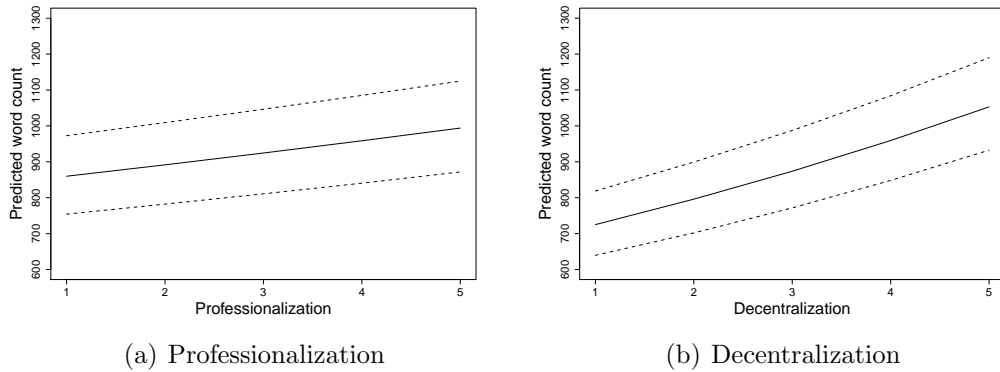


Table 4 contains the differences in interest group characteristics in the first column and the associated estimated differences in predicted information supply in column two together with a 95 per cent confidence interval. As the endowment with resources changes from 1.0 to 3.0, the predicted information supply increases by approximately 124 words. When resources rise from 3.0 to 5.0, the predicted information supply even increases by 144 words. The predicted change in information supply caused by an increase in functional differentiation is also positive and statistically significant, however the size of the effect is considerably smaller than for resources. As functional differentiation rises from 1.0 to 3.0, the predicted information supply increases by approximately 66 words and as functional differentiation rises from 3.0 to 5.0, the predicted information supply increases by about 71 words. An increase in the degree of professionalization also has a statistically significant impact on information supply. As professionalization rises from -0.5 to 2.0, the predicted information supply increases by approximately 77 words. Decentralization has the highest effect on information supply. When the degree of decentralization rises from 1.0 to 3.0, the predicted information supply rises by approximately 149 words. Similarly, when decentralization increases from 3.0 to 5.0, the predicted information supply augments by about 180 words.

In conclusion, the multilevel poisson regression using listwise deletion confirms the hypotheses specified in the theory section. Resource endowment as well as organizational characteristics have a statistically significant effect on information supply to the European Commission. Interest groups with a high amount of resources at their disposal provide on average more information than interest groups with few resources. Similarly, the higher the degree of functional differentiation, professionalization and decentralization, the higher on average the amount of information that interest groups supply to the European Commission. Hence, the hypotheses derived from the theoretical framework were confirmed by the preceding analysis. In addition, two of the control variables also have a statistically significant effect on information supply. The higher the salience of

Table 4: First differences: Effect of interest group characteristics on information supply

Change in explanatory variable	Predicted change in information supply	95% Confidence interval	
Resources			
1.0 - 3.0	124.475	107.521	141.444
3.0 - 5.0	143.940	124.329	163.886
Functional differentiation			
1.0 - 3.0	65.868	56.719	76.643
3.0 - 5.0	71.214	61.120	83.058
Professionalization			
-3.0 - -0.5	70.733	60.814	81.759
-0.5 - 2.0	77.441	66.470	89.724
Decentralization			
1.0 - 3.0	149.072	130.512	168.794
3.0 - 5.0	179.627	157.428	203.131

Only interest group characteristic in question is changed; all other variables are held at their means

issues to interest groups and the higher the complexity of policy issues, the higher on average the amount of information provided by interest groups.

In order to test the robustness of the results obtained by listwise deletion, I also tested the hypothesized effects drawing on multiple imputation. Since multiple imputation should be avoided for variables with more than 50 per cent of missing values, I did not impute values for the entire sample ($n=2,696$), but only for the sample of interest groups after removing all unit non-responses ($n=1,170$). The number of missing values in this sample does not exceed 34 per cent. Since the explanatory variables were measured on a five point ordinal scale and are therefore not “truly” metric, I applied multiple imputation by chained equations which is better suitable for ordinal variables (van Buuren Stef 1999; Raghunathan et al. 2001).¹³ The multiple imputation estimates were obtained using 500 cycles and 100 imputations.¹⁴ In order to assess the convergence of the markov chains, I inspected trace plots and computed the Geweke diagnostic, the Raftery and Lewis diagnostic as well as the Heidelberger and Welch diagnostic (see e.g. Gill 2008, 463-493). The trace plots and the empirical diagnostics do not indicate any problems with convergence.¹⁵

When checking for collinearity I detected a high correlation between two of the independent variables: Functional differentiation and resources correlate at 0.67. Collinearity results in higher standard errors and if two variables are strongly collinear, the

¹³I used Patrick Royston’s *ICE* (Imputation using chained equations) procedure which implements multiple imputation by chained equations for the statistical software package *STATA* (Royston 2004).

¹⁴Even though the literature on multiple imputation considers already 20 cycles as sufficient (van Buuren Stef 1999, 690), I also ran a second version using 100,000 cycles and 5 imputations which corresponds to a decent number of cycles according to the literature on Bayesian statistics. The results are essentially the same.

¹⁵The average value of the Geweke diagnostic is 1.805, the average value of the Raftery and Lewis diagnostic (dependence factor) is 1.419 and all eight chains passed the halfwidth test (Heidelberger and Welch diagnostic).

data contains little information about the impact of the first variable when the second is held constant since there is little variation in the first variable when the second is fixed (Fox 2005, 354). While collinearity does not affect the direction or significance of the estimated effects using multilevel poisson regression with listwise deletion, the size and the statistical significance of the effects of resources and functional differentiation vary in the multiple imputation analysis. I therefore first present the multilevel model including both variables at the same time and then illustrate separate models including either resources or functional differentiation.

Table 5: Multilevel poisson regression explaining information supply (multiple imputation)

Variables	Complete	Without resources	Without funct. differentiation
Fixed effects			
INTEREST GROUP CHARACTERISTICS			
Resources	1.106*** (0.012)		1.114*** (0.009)
Functional differentiation	1.012 (0.012)	1.091*** (0.010)	
Professionalization	1.008 (0.015)	1.013 (0.015)	1.007 (0.626)
Decentralization	1.061*** (0.010)	1.052*** (0.009)	1.062*** (0.009)
CONTROL VARIABLES			
Salience to interest group	1.193*** (0.023)	1.187*** (0.023)	1.193*** (0.023)
Complexity	1.365*** (0.084)	1.371*** (0.085)	1.365*** (0.085)
Existence of EU status quo	1.200 (0.158)	1.205 (0.158)	1.198 (0.158)
Random effects			
Issue level variance	0.208	0.209	
Model Fit			
N / Issues	1170 / 56	1170 / 56	1170 / 56
Cycles	500	500	500
Imputations	100	100	100
Deviance	780398	789048	780604
AIC	780416	789064	780620
BIC	780462	789104	780661

*** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$, coefficients represent incidence-rate ratios, standard errors in parentheses

Table 5 presents the results of the multilevel poisson regression using multiple imputation.¹⁶ The first column contains the results of the complete analysis including resources and functional differentiation at the same time. The direction of the effects of all explanatory variables remains stable as compared to the listwise deletion analysis. In addition, resources, decentralization, salience to interest groups and complexity of

¹⁶Model fit values represent the mean of the 100 separate model fit values. These have to be treated with care since there is no clear consensus on how to interpret log likelihoods and information criteria when the individual analyses are combined.

the policy issue have a statistically significant effect on information supply to the European Commission. Due to collinearity with resources, functional differentiation only has a statistically significant positive effect if resources are excluded from the analysis. Professionalization and the existence of prior EU level legislation do not have a statistically significant effect on information supply according to the multiple imputation analysis. Except for professionalization, the effects obtained by listwise deletion have thus been confirmed by the multiple imputation analysis.¹⁷

In conclusion, the preceding analyses have confirmed that resources and organizational structure have an important effect on information supply to the European Commission. Interest groups which can draw on a high amount of financial and personnel resources provide on average more information to the Commission than interest groups which are only poorly equipped with resources. Similarly, organizational adaptation to the institutional environment is important to be able to supply information to the European Commission. As expected, functional differentiation and decentralization have a statistically significant positive effect on the amount of information provided to the European Commission. Thus, interest groups which are highly functionally differentiated and which dispose of a highly decentralized internal decision-making structure, are better able to provide information to the Commission than interest groups which did not adapt their internal organizational structure to the highly complex vertically and functionally differentiated institutional environment. Professionalization by contrast does not have a robust statistically significant effect on information supply. Even though this effect was positive in all analyses, the statistical significance of this effect was not robust across different model specifications.

In terms of control variables, salience of policy issues to interest groups and complexity of the policy issue have a positive effect on information supply. Thus, interest groups which consider a policy issue as very important, provide on average more information to the European Commission than interest groups which attach less importance to an issue. Similarly, the average amount of information provided by interest groups increases with the complexity of the policy issue.

5 Conclusion

A major objective of interest groups is to influence policy-making. Information supply to decision-makers is an important instrument through which interest groups can exert influence on political decisions. However, the amount of information provided

¹⁷In order to further check the robustness of the results to model specification, I also estimated a linear multilevel model and the effects are substantially the same.

to legislators varies extensively across interest groups. This article therefore aimed at solving this puzzle by explaining why some interest groups supply more information to decision-makers than others. Drawing on resource mobilization and organizational contingency theory, I hypothesized that information supply increases with the resources, the functional differentiation, the professionalization and the decentralization of interest groups. I tested these hypotheses based on a large-N analysis of information supply to the European Commission. The empirical analysis confirms that resources and the internal organizational structure indeed account for variation in information supply.

Interest groups which have a high amount of resources at their disposal provide on average more information to the European Commission than interest groups which are only poorly equipped with resources. Thus, interest groups which are well-endowed with resources find it rather easy to develop and provide the information required by the European Commission. By contrast, without any budget or staff, interest groups cannot efficiently monitor and participate in EU decision-making. They are therefore not able to develop policy expertise and to supply information to the European Commission. As information supply is positively associated with the ability to influence policy-making (Bouwen 2004; Bernhagen and Bräuninger 2005; Klüver 2011), interest groups which are well-equipped with resources therefore also have a higher chance to influence the content of the policy proposal since the European Commission is in need of policy-relevant information.

I have furthermore demonstrated that the internal organizational structure plays an important role for effective lobbying in the European Union. Surprisingly, interest groups have so far been largely treated as black boxes without any attention to their internal configuration when examining their ability to influence policy-making. However, as this article has shown and in line with expectations of organizational theory, the adaptation of the internal organizational structure of interest groups to their institutional environment has an important effect on their ability to effectively lobby policy-makers. The complex institutional environment in the European Union creates a high amount of uncertainty since it is difficult to oversee policy developments. Interest groups need to effectively monitor the policy-making process and need to develop tight networks with Commission officials and other interest groups in order to quickly find out about new policy initiatives. A highly decentralized decision-making structure enables them to quickly respond to new policy initiatives. In addition, high functional differentiation enables interest group employees to focus on one specific policy field in which they become specialists and members of policy communities with officials dealing with this policy area. They are therefore able to find out early about new policy developments and to develop important expert knowledge that is required by the European Commission. Hence, interest groups whose internal organizational structure matches the complex institutional environment

at the European level, find it relatively easy to provide information to the European Commission. More specifically, interest groups which are highly functionally differentiated supply on average more information to the European Commission than interest groups with a low degree of functional differentiation. Similarly, interest groups which are characterized by a high degree of decentralization, supply on average more information than interest groups which are highly centralized.

The empirical analysis however does not allow to draw conclusions about the hypothesized positive effect of professionalization. However, even though it is not statistically significant across all model specifications, the direction of the effect is always positive. This is an indication that the theorized positive effect can indeed be found in European Union lobbying. Thus, the qualification of employees indeed seems to have a positive impact on information supply to the European Commission. However, in order to arrive at more conclusive findings, further empirical research preferably across a larger number of cases is needed.

The empirical findings have major implications for our understanding of interest group participation in European policy-making. The European institutions have taken various initiatives to foster interest group inclusion in decision-making processes at the European level in an effort to bridge the gap between citizens and the European institutions (see e.g. Kohler-Koch 2007). At the same time, scholars have debated the democratic potential of interest group participation in European policy-making (Greenwood 2007; Saurugger 2010). The findings of this article however suggest that access to the European institutions does not guarantee effective interest representation. By contrast, effective lobbying in terms of information transmission to decision-makers requires a sufficient amount of resources as well as an organizational structure that is adapted to the complex institutional environment at the European level. While interest groups need on the one hand a specific organizational structure to meet the information demands of the European Commission, it is unclear how the participation of citizens within interest groups is affected by this organizational adaptation. Future research therefore needs to further investigate the organizational structures of interest groups and the participation of citizens in internal decision-making processes within interest groups to arrive at a more profound assessment of the democratic potential of interest group inclusion.

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