1. Introduction


The development and establishment of interest groups has been well documented in theoretical as well as empirical respect. This knowledge is mainly based upon theories and...
approaches of collective action, of resource exchange and of political entrepreneurship. Yet, research gaps remain concerning the embedding of interest groups within systems of interest intermediation and the effects of embeddedness on interest group behavior. Empirical studies, which explicitly focus on inter-associational relations, such as cooperation coordination and contacts, are rare. In one of the few studies, Rainer Eising (2004) elaborates on the cooperation between various types of business associations and other organizations. The author concludes that, first, the overall majority of business associations work closely with other business associations and, second, central associations are involved in organizational associations across various sectors and levels (Eising 2004, pp. 234-235).

Aside from corporatist studies, a neo-pluralistic research tradition has developed especially within US and EU interest group research, which regards the effects of niche competition and competition intensity on populations of interest groups (Gray & Lowery 1996a, Lowery & Gray 2004, McFarland 2007). Inter-organization coordination effectively has the function of attenuating competition for potential members and for access to the political-administrative system.

The effects of embeddedness on associational behavior and in particular lobbying, has not been addressed so far. This is astonishing since the diffusion and convergence of policies in political science, and organizational imitation and learning in organization science have become established research areas while at the intersection of both – namely interest group research – the diffusion, imitation and learning of associational behavior has not made it on the research agenda. This paper seeks to address this theoretical and empirical research gap and analyzes the influencing factors on the links between organized interest and their lobbying links to political institutions, in this case the European Commission and the European Parliament.

In this paper, I focus on 57 German and British business associations\(^1\) from the information and communications sector (I&C) and from the chemicals sector. Both industries are comparable due to their similarly large market shares, their innovation dynamics in some sub-sectors such as the life sciences in the chemicals sector or the gradual convergence of print media, telecommunications, radio and internet in the I&C sector. In both industries, regulatory frameworks are highly Europeanized which made it necessary to adapt

\(^{1}\) These are the most important sectoral business associations in the year 2002.
associational structures and strategies to these conditions. Germany and Great Britain are compared since the influence of technological developments and Europeanization is largely identical. The countries differ in the scope of hierarchy of their national systems of central associations, which is hierarchical in Germany and nearly inexistent in Great Britain. Industries differ in the degree of institutionalization, the I&C sector is rather new while the chemicals industry is about 150 years old.

The paper proceeds in two analytical steps: first, the evolution of the sectoral associational populations is scrutinized and the degree of embeddedness of individual organizations is determined. The embeddedness of business organizations provides channels of diffusion and imitation. Second, it analyzes whether the embeddedness of business associations leads to different lobbying patterns. Embeddedness is defined here as the sum of adjacent business associations (= direct neighbors).

Aside from the introduction, the paper is divided into four sections. The second section is concerned with the conceptual clarification of inter-organizational contacts between business associations and their potential impact on lobbying activities. Furthermore the next chapter describes other factors that determine political behavior. The third section describes the research design, specifies the variables and presents the applied methods. Following, the independent variables are described and association networks are outlined. The penultimate chapter analyzes the contacts of business associations to the European Commission and the European Parliament.

2. Theoretical perspectives on associational networks and lobbying
The development of inter-associational structures within the business association landscapes and their impact on the political behavior may be studied from three different theoretical perspectives. The neo-pluralistic perspective (Lowery & Gray 2004, McFarland 2007) refers to complex, non-linear and often non-rational aspects of associational behavior. In contrast, exponents of neo-corporatist association theory see hierarchical organized association systems as crucial factors (Schmitter & Streeck 1999, Streeck & Kenworthy 2005). In this paper it is argued that the literature on the diffusion of organizational behavior complements the neo-pluralist approach providing an additional context that shapes associational behavior.
2.1 Neo-corporatist theory

The development of neo-corporatist theory, which was explicitly conceptualized as counter-model to the Anglo-Saxon model of pluralism, is based on the idea of a hierarchical association pyramid. Concerning the field of inter-organizational relations, neo-corporatist research therefore predominantly focuses on the depiction and analysis of formal and informal hierarchies. According to Schmitter and Streeck (1999), these include umbrella associations and their member associations on the one hand, and association systems with differentiated domains of interests on the other hand. Differentiation and integration in association systems can be identified alongside a vertical and a horizontal dimension (Schmitter & Streeck 1999, p. 72-78). Horizontal differentiation may result from distributing domains among different associations within one sector, which are all specialists in certain sections of the entire domain of interests. Autonomous actions by associations will lead to overlapping domains in unregulated association systems, ultimately triggering competition. Vertical differentiation may result from the formation of umbrella associations, which intervene and coordinate associations’ activities on the lower levels and hence ensure a vertical or hierarchical integration of associations within an association system (Coleman & Montpetit 2000). Regarding lobbying activities, peak associations need not lobby in the national context since they routinely participate in political decision making and implementation. However, in a multi-level context such as the EU, in which there is no delegation of powers to societal actors, peak associations have to resort to lobbying tactics in order to exert political influence. Eising in his large-n comparison on access to EU institutions concludes that peak associations having higher organizational capabilities find it easier to adapt to the European polity. This is particularly true for peak associations socialized in neo-corporatist domestic settings (Eising 2004, Eising 2007a).

The involvement of business associations in already existing central association systems varies significantly in the investigated countries. In Germany, a dipolar association hierarchy with two central associations from the field of economic policy and labor market policy exists: the German Federal Association of the German Industry, the Bundesverband der Deutschen Industrie (BDI), as well as the Confederation of German Employers’ Associations, the Bundesvereinigung der Deutschen Arbeitgeberverbände (BDA). While the BDI exclusively represents the interests of the economy’s industrial sectors, the service industry is represented by other business associations. Within the industry sector, the central
associations of the BDI enjoy representative monopoly\(^2\) (Lang & Schneider 2007). All German associations are hence divided into a corporatist industry sector and a quite pluralistic service sector. The situation in Great Britain is entirely different. The Confederation of British Industry (CBI) as a central association in economic and labor market policies lacks hierarchical foundations. Commencing during the Thatcher years, the increasing insignificance of organized interests has left its mark on the British business associations (Baggott 1995, Richardson 1993). Therefore, the CBI can be seen as *primus inter pares* by now. Although it has the most business members, mostly from the industrial sectors, the CBI holds no special institutional privileges.

### 2.2 Neo-pluralist theory

Already in the 1990s, the neo-pluralistic perspective emerged by bringing together pluralist and population ecologic approaches (Gray & Lowery 1996a, Lowery & Gray 2004, McFarland 2007). The neo-pluralist approach is a collection of models, unified by the assumption of nonlinear associational behavior and feedback processes between associational characteristics and institutional settings (Lowery 2007). The neo-pluralist approach heavily borrows from ecology and evolutionary theory to model the demography of business association populations, that is the founding and disbanding rate of associational populations as well as the entries and exits of associations in their lobbying communities (Aldrich et al 1990, Aldrich et al 1994, Gray & Lowery 1994, Gray & Lowery 1996b). Among other factors, it investigates the influence of political and economic factors on the formation and development of business association systems. Accordingly, empirical studies emphasize the consequences of market growth, which has an immediate effect on the business association system and tends to lead to more business associations (Aldrich et al 1994).

The neo-pluralist approach also provides a niche theory of domain overlap and inter-associational networks. According to niche theory, business associations position themselves in niches that more or less account for a large part of the interest spectrum within a business sector and moreover consist of the available resources within the niche. An ever-increasing population of organizations will lead to rising competitive pressure and will force associations to find niches or to partition and hence reduce niches of competitors (Gray and Lowery 1996). Niches can be partitioned via two mechanisms (Gray and Lowery 1996: 107):

\(^2\) At least within the BDI.
For one thing, business associations can compete for a common subset of niches until a partitioning has taken place. For another, business associations can actively cooperate and consensually agree upon a niche partitioning. In both cases, niches do not continue to overlap. With regard to the embedding of inter-organizational networks, niche partitioning leads to new associations competing for niches, while older business associations generally tend to have already fought it out or have agreed upon a partitioning together with other associations. Thus inter-associational contacts emerge as a means of reducing domain overlap.

Another central tenet of the neo-pluralist approach emerged out of numerous studies that could not find a direct and generalizable link between lobbying efforts and lobbying success. The basic fact that organized interests do lobby (Lowery 2007: 29) “given the uncertainty of the benefits” (Heinz et al 1993: 369) is still underexplored theoretically. The answers given by neo-pluralists highlight the complex nature of the political and influence process. Public opinion, institutions and size matter but not all at the same time and with equal strength. Lowery summarizes the research agenda as follows (Lowery 2007: 29):

The most important include a new appreciation of significant linkages and feedbacks between the stages of the influence process—how mobilization processes influence and are influenced by the demography of interest populations and how both influence and are influenced by the selection of influence tactics and strategies.

This multi-context theory of lobbying emphasizes the importance of different contexts in the understanding of the choices made by representatives of organized business regarding lobbying channels and tactics.

2.3 Diffusion

This paper argues that there is another context which exerts an influence in the choice of lobbying channels that is the embeddedness in a network of other business associations. The stylized answer to the neo-pluralist question of ‘why organized interest lobby’ would simply be ‘because some well-known organized interests also do lobby’.

The diffusion of organizational behaviors has been studied extensively in management and organization studies (Levitt & March 1988). Sociological institutionalism has conceptualized the spread of rational behavior through mimetic processes that eventually lead to
isomorphic organizational fields (DiMaggio & Powell 1983). DiMaggio and Powell describe the innovation process as primarily driven by norms of legitimacy. The acceptance of a certain organizational behavior within an organizational field leads to a further adoption by other organizations thus increasing the acceptance once more. A similar argument, known as the bandwagon effect, has been put forward by Abrahamson (Abrahamson 1991, Abrahamson 1996) and Abrahamson and Rosenkopf (Abrahamson & Rosenkopf 1993). Bandwagon effects create reinforcing feedback loops that lead to the adoption of organizational innovations even in the face of inefficiencies (O’Neill et al 1998). Abrahamson and Rosenkopf explain the underlying mechanism as follows (Abrahamson & Rosenkopf 1993)(488):

“[…] imagine that a few organizations adopt what they assess as a technically efficient innovation that will produce profits. These adoptions initiate a bandwagon pressure. As a result, organizations that decide not to adopt the innovation because they assessed that it would yield small losses will experience an added bandwagon pressure to adopt the innovation. If some of these organizations succumb to this bandwagon pressure, then the number of adopters and the pressure increase further, prompting organizations that assessed the innovation as even more technically inefficient and unprofitable to jump on the bandwagon.

Gatignon and Robertson found additional factors that influence the adoption of organizational innovations. The concentration of the organizational field and industry increases the adoption rate since firms can use this innovation as a competitive advantage compared to non-adopters. Furthermore, they found that organizational decision makers with access to personal information from other adopters are more likely to adopt the innovation in their own organization (Gatignon & Robertson 1985, Robertson & Gatignon 1986).

Nystrom, Ramamurthy and Wilson identify further contextual elements that increase the likelihood of adoption and diffusion of organizational innovations (Nystrom et al 2002): size and age of the organization that adopts an innovation. Organizational size corresponds positively with the adoption of new innovations since it usually provides enough slack resources to accommodate the innovation in the organizational setting. Organizational age might have a mixed effect on the adoption of new innovations. On the one hand it is likely that older organizations are larger and wealthier and are thus more able to adopt innovations. On the other hand, older organizations “may become so rooted in past practices that a substantial degree of inertia accumulates over time” (230).
3. Research design, data collection and statistical methods

The impact of the embeddedness of organized business interests on lobbying behavior may be best studied with methods developed in the field of quantitative social network analysis. For the most part, social network analysis studies the relations among the most relevant actors. In order to reduce the selection of actors to a small group of relevant business actors, one has to first determine the entire population of actors. This procedure is outlined briefly: (Almost) all business associations in the I&C and the chemicals sector were detected through lists of associations or the internet. Via expert surveys\(^3\) in both countries, the examination units were selectively chosen. This procedure reduced the total number of investigation units to 18 German and 20 British business associations. From these, in turn, 15 German and 15 British business associations took part in the standardized questionnaire in the time period from September 2002 to July 2003 (Lang 2006). The respective figures for the chemicals business associations were 14 out of 14 focal associations participated in the survey (Grote & Lang 2003, Grote & Schneider 2006a). One British chemical association had to be excluded due to missing data in the network part of the questionnaire.

The contact network was collected by the following question: “Please name those organizations, with which your association has contacts. Distinguish between “occasionally” (1) and “regularly” (2).” The data was subsequently dichotomized. The inquiry of contacts and information exchange belongs to the standard repertoire of social network analysis (Beyers 2004, Beyers & Kerremans 2004, König 1992, König & Bräuninger 1998, Pappi & Henning 1999, Pappi & Knoke 1991). The standardized questionnaire contained information on contacts between business associations and between business associations and political institutions such as the European Parliament and the directorate generals of the European Commission. The variable \textit{degree} is based on the on-mode network that includes contacts between business associations for every sector. The sum of outgoing contacts (=outdegree) measures the embeddedness of every business associations in its sectoral population.

Most studies presume that the frequency and intensity of contacts to political institutions equal the amount of access an interest group has in the political process (Eising 2004, Eising

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\(^3\) Experts included researchers from the field of information and communication, members of the states’ panel of experts and chief editors of specialist journals. In all three countries, experts were chosen from many different fields to avoid any sectoral bias. The experts were asked to assess the relevance of all associations in the policy process, on a scale from 0 = unimportant, 1 = important to 2 = very important. The sum of expert evaluations shows a ranking of the associations’ reputation per country. Finally, the analysis includes all associations scoring more than 25% of maximum points when expert rankings were added.
2007a). Therefore, two variables have been constructed that capture the number of contacts to European institutions per business association (contacts to DGs and contacts to EUP).

The variable competitors was also assessed in the standardized questionnaire. The representatives of associations were asked which other associations within their branch were active and whether or not domains overlapped between the associations. All answers were coded on a binary scale.

In a subsequent analysis, both, contact and competitor n*n matrices have been multiplied by another matrix, that contained information on the number of contacts to the DGs. This variables provides information on the number of competitors/contacts and their number of contacts to the DGs. A high value indicates, for instance, that many competitors have (each of them) many contacts to the DGs.

Data analysis was carried out using linear mixed-effects models (LME) available in the R programming environment (R Development Core Team 2011), within the package lme4 (see for what follows: Bates & DebRoy 2004, Bates et al 2011, Pinheiro & Bates 2000). Such models provide an efficient means to model item level responses clustered within groups. As in every linear model, an LME describes the relationship between a response variable and some covariates. In a mixed effects model at least one of these covariates is categorical and represents a grouping factor. In this paper, sectoral associational populations were treated as a grouping factor. A LME incorporates two random variables, namely the response vector \( \mathbf{Y} \) which can be observed, and the random effects vector \( \mathbf{B} \) that is not observable. The marginal distribution is \( \mathbf{B} \sim N(0, \Sigma(\theta)) \), where \( \theta \) is a vector of variance-component parameters. The conditional distribution, \( (\mathbf{Y}|\mathbf{B} = b) \), depends on \( b \) only through its mean. This conditional mean depends on \( b \) and on the fixed-effects parameter vector \( \beta \) through a linear predictor expression, \( Zb + X\beta \). The model matrices \( Z \) and \( X \) are determined from the form of the model and the values of the covariates. In order to account for different levels of measurement of different response variables, a generalized linear mixed model (GLMM) is applied. In a GLMM the n-dimensional vector of linear predictors (\( \eta \)) incorporates as in the case of the simple LME both fixed effects (\( \beta \)) and random effects, \( b \), as \( \eta = X\beta + Zb \). GLMM allow for the conditional distribution other than Gaussian (Bernoulli, Poisson, etc.). As for the grouping factors, a scalar random-effects term generates one random effect for each level of the grouping factor which are then horizontally bundled in the model matrix \( Z \) (Bates
& DebRoy 2004, Bates et al 2011, Pinheiro & Bates 2000). The random effects can be interpreted as representing unobserved random variables within the grouping factors such as the associational populations. In contrast, the fixed effects represent the typical (estimated) relationship between response and covariates.

4. Associational networks in the I&C and chemicals sector
The number of focal associations has increased in all sectoral association populations in the period between 1988 and 2002. This differentiation process was triggered through technological innovations in the field of digitalization and biotechnology as well as through the growing economy. Technological innovations have led to new niches within the spectrum of interests, into which new and established associations can expand. Following, the essential dynamics of development and their effects on sectoral association landscapes are outlined briefly (for a detailed portrayal, see Lang 2006, Grote & Lang 2003).

4.1 The evolution of business interest populations: foundings and domain overlap
In both countries and sectors, the strong economic sector growth has led to an increase of enterprises operating in the information and communications and the chemicals sector and hence, triggered the formation of business associations (Grote & Lang 2003, Grote & Schneider 2006b, Lang 2006, Lang 2009). Since 1988, more than one third of business associations complemented the focal associations set. Most foundings took place in Germany with ten (I&C: 6 and Chemicals: 4) and four in Great Britain (I&C: 3 and Chemicals: 1).

In the I&C sector, associations operating at the interfaces of different sub-sectors have established themselves. Particularly in the late 1990s, new business associations were established. In 1995 the German Multimedia Association (Deutscher Multimedia Verband) was founded, while in 1998 two smaller associations merged into the Association of Distributors of Telecommunications Services and Value Added Services (Verband der Anbieter von Telekommunikations- und Mehrwertdiensten or VATM). In 1999, a divisional association split from its parent associations VDMA and ZVEI and became the largest I&C association known to date: BITKOM (Bundesverband der Informationswirtschaft, Telekommunikation und Neue Medien, or Federal Association of Information Economy, Telecommunications and New Media). The British trade association system, in contrast, has
faced only moderate re-arrangements since the 1980s. Almost half of the focal organization was set up in or after the year 1980. Before that time trade associations representing the content industries dominated the associational landscape in the information and communications sector. The London Information Exchange (LINX) and the Internet Service Providers Association (ISPA), representing new communications technologies, were the latest focal trade associations that were established in the 1990s.

**Fig. 1: The evolution of business association populations**

Over the past two decades, only few new business associations joined the populations of chemical industry associations (Grote & Lang 2003, Grote & Schneider 2006b, Lang 2006, Lang 2009). Among the Germany focal associations, these are the association for surface protection liquids in industrial applications (IHO in 1992), the association of research-intensive pharmaceutical manufacturers (VFA in 1993) and the sector group for
biotechnology companies (DIB in 1998). In 1993, a major organizational change occurred as the pharmaceutical association *Bundesverband der Pharmazeutischen Industrie* (BPI) split into an association for research-based pharmaceutical companies (Verband Forschender Arzneimittelhersteller, VFA), and an associations for generics drug companies (continuing as BPI). The British system of chemical industry associations the overall number of focal associations has remained stable and now accounts for 14 organizations. The only newly founded association is the *Specialised Organic Chemicals Sectors Association* (SOCSA).

4.2 Domain overlap and competition

New niches for business associations were created through technological convergence and technological innovations, also forming settling points for niche associations (Grote & Lang 2003, Grote & Schneider 2006b, Lang 2006, Lang 2009). In the I&C domain, overlaps especially affect associations in the communications sub-domain, whereas media associations were able to uphold the traditional organizational division of labor and cooperation between newspaper and magazine publisher associations, radio associations as well as associations of the advertising industry. However, the development was not uniform in the two countries. Unlike in Germany, where some associations were developed across branches, there were very few such developments in Great Britain. German business associations that organize telecommunications and electronic equipment companies developed competitive relations to one another. Particularly newly established associations positioned at the intersections between sub-domains and have multiple domain-overlaps to other associations. In particular, the designated sectoral peak association BITKOM competes with no less than half of the focal associations sample. This is mainly due to the massive enforcement of an associational hierarchy in this sector by the national industrial peak association BDI, which aimed to incorporate this fast growing sector into its portfolio. In the British population of I&C industry associations, some domain overlaps exist at the intersections between the content and printing branch. There hardly exists relationships among telecommunication and internet industry associations. British telecommunication and internet industries associations tend to be rather small in comparison with their German counterparts, each of them acts in its own niche which is hardly challenged by other associations.
In the chemical sector, the German population of organized chemical interest represents a prototypical corporatist configuration that centers around an all-encompassing peak association, the chemical industry association, *Verband der Chemischen Industrie*, VCI (Grant et al 1989, Grant et al 1988, Grote & Lang 2003, Grote & Schneider 2006b). Few competitive relations have recently been introduced into the network by newly established biotech and life science associations that compete with the well-established BPI (Grote & Schneider 2006b).

In the British chemicals domain, due to the lack of major changes in the composition of the associational population, there a few domain overlaps between business associations. These involve mainly the Association for Chemical Specialties (BACS) which has a domain that cross-cuts other sectors.

4.2 Membership in national peak associations and European branch associations

The integration and coordination of national business association systems create a framework for the development of sectoral systems. National systems of business associations differ greatly in the degree of integration and coordination. Likewise, the BDA plays a vital role in Germany; however, this only accounts for the employer associations. Still, no comprehensive coordination by a central association exists. While the representation of the service sector is fragmented, the BDI merely plays a coordinating role within the industrial field. However, the coordinating group, the so-called *Gemeinschaftsausschuss der deutschen gewerblichen Wirtschaft*, loosely coordinates the general interests concerning economic and labor policies. New members are seldom admitted to the BDI, which is mainly due to little structural changes in the German industrial sectors (Lang & Schneider 2007).

In Great Britain, no coordinated association system has been developed, although the CBI was established as central association for economic and labor policies in the year of 1965. The CBI thereby acts as both umbrella association of branch associations and ‘regular’ association with direct organizational members. But the focal point of members clearly lies on industrial organizations and few branches, such as the chemical industry and mechanical engineering. Therefore, the CBI only has a representative monopoly in few branches and is furthermore dominated by big industry, which has obtained special importance through direct membership (Hartmann 1985).
The German peak associations, led by both BDA and BDI, were affected by the shifting association population in the information and communication sector. Within the investigation period, the *Bundesverband Informationswirtschaft, Telekommunikation und neue Medien* (BITKOM)\(^4\), which was formed in 1999, became member of the BDI and changed the existing hierarchy of member associations. After the admission of the BITKOM, one of the biggest economic sectors in Germany was represented and one representative joined the BDI’s presidency. Within this presidency, there are also representatives of the association of German mechanical and industrial engineering, the *Verband Deutscher Maschinen- und Anlagenbau* (VDMA), and of the central association of electrical engineering and electrical industry, the *Zentralverband Elektrotechnik- und Elektroindustrie* (ZVEI). There were no changes within the BDA. Only the associations of German newspaper publishers, the *Bundesverband der Deutschen Zeitungsverleger* (BDZV), and the association of German magazine publishers, the *Verband Deutscher Zeitschriftenverleger* (VDZ), are members of the BDA. In the chemicals sector, there is just one association that represents the interests of chemical companies within the BDI, the umbrella association VCI.

In Great Britain, the sectoral changes had no effects on the composition or structure of the national central association systems. No more than three business associations of all analyzed information and communication associations are members of the national umbrella association CBI, namely the British Printing Industries Federation (BPIF), Federation of Electronics Industry (FEI) and Institute of Practitioners in Advertising (IPA). These belong to the sector’s established associations. There has not yet been any admittance of new business associations. In contrast to the I&C sector, eight chemical industry associations are members of the CBI (see Fig. 2).

Almost 80% of the focal association set has been a member of some EU branch association in 2002. Membership rates are almost equally distributed between the sectoral populations (GER IC: 10, UK IC: 11, GER Chem: 11, UK Chem: 12)

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\(^4\) In October 1999, the common *Fachverband Informationstechnik* of the VDMA and the ZVEI with the *Fachverband Kommunikationstechnik* of the ZVEI and the associations, the *Bundesverband Informations- und Kommunikationssysteme* (BVB) and the *Bundesverband Informationstechnologien* (BVIT), merged to create the BITKOM. The four associations discontinued their activities as of January 1\(^{st}\), 2001, dissolved their structure and finally fused. A fifth association, the *Unternehmensverband Informationssysteme* (UVI), also participated in the merger. The VAF, the ZVEI and the VDMA are all focal associations within the BITKOM.
4.3 Sectoral networks of business associations

The previous section displayed the population growth and the admission capabilities of the national central association systems led to new formations and increased domain competition in the sectoral association landscapes. These compositional changes have also left tracks in the contact networks. However, the networks show enormous differences across countries (see figure 2).

Fig. 2: Contact networks

In the I&C sector, the German contact network contacts between media associations (APR, BDZV, VDZ, VPRT and ZAW) are frequent. In contrast, communication technology
associations (BITKOM, Breko, Eco, VATM, VDMA and ZVEI) have seldom contacts to each other. Considering the German associational population, the newspaper publisher association BDZV possesses the most direct ‘neighbors’ within the network. The VPRT and VDZ have nearly as many relations to other associations. The only communication association with a similar amount of information exchange relations is the information technology association VATM, which is directly related to other associations. The telecommunication and end device associations, including the BDI member associations BITKOM, VDMA and ZVEI, are positioned at the network’s periphery and possess few direct ‘neighbors’. Contrary to the hierarchical national peak association system, the contact network has no hierarchical structure, which could be seen as equivalent to the organization of other sectors, such as the chemical sector (Grote & Lang 2003; Grote & Schneider 2006).

Within the British contact network, most contacts exist between the umbrella association of the British advertising industry, the Advertising Association (AA), and its members, the CRCA, IPA and PPA. These associations have relations to the Publishers Association (PA) and the Newspaper Society (NS), which is also a member of the AA. With regard to the communication technology associations, the internet associations ISPA and LINX and the other communication associations FEI and FCS are sparsely connected.

In the chemicals domain, the peak association VCI has, together with the association for organic chemistry producers, the most contacts. It maintains contacts to all other associations, which is hardly surprising since all of them are members of the VCI. Contacts between sectoral branch associations are less frequent. In the British contact network, the peak association CIA also occupies a central position in the network, that is, however less pronounced than in the German case. As a result of the less centralized network, network density is considerably higher than in the German case.

4.4 Summary: the evolution of sectoral populations of business associations

All sectoral populations have experienced changes in their compositions, the level of domain-overlap and network structures (see Fig. 1). Most compositional changes occurred in the German populations where a substantial part of the populations have been established in the 1990s. Furthermore, changes have been more profound in the I&C sector and on the chemicals domain. This clearly reflects the maturity of the chemicals industry, the I&C industry is still in flux. As a result, I&C industry associations are on average younger than
their chemical industry counterparts, the same applies to British associations compared to the German ones.

The newly established associations also introduced a new level of competition into the established associational populations. Again, competition is more frequent in the I&C sector and in the German populations.

Fig. 3: Explanatory factors

Note: age has been transformed: age=log(2000 - founding year)

These changes have clearly left their mark in the embeddedness of individual business associations within their associational populations. Networks structures differ widely, some
are more dense (German networks, Chemicals), others more centralized (British networks, Chemicals).

Tab. 1: Explanations of embeddedness measured as degree centrality (family=poisson, link=log)

<table>
<thead>
<tr>
<th></th>
<th>Varying intercept model</th>
<th>Varying intercept model</th>
<th>Varying intercept and slope model</th>
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<tbody>
<tr>
<td>Random effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country and sector (intercept)</td>
<td>0.07 (0.26)</td>
<td>0.06 (0.24)</td>
<td>1.46 (1.21)</td>
</tr>
<tr>
<td>Competitors</td>
<td></td>
<td></td>
<td>0.01 (0.08)</td>
</tr>
<tr>
<td>Age (log(2000-founding year))</td>
<td></td>
<td>0.07 (0.26)</td>
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<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
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<tbody>
<tr>
<td>(Intercept)</td>
<td>1.75 ***</td>
<td>1.55 ***</td>
<td>1.70 **</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.25)</td>
<td>(0.65)</td>
</tr>
<tr>
<td>Competitors</td>
<td>0.07 (0.04)</td>
<td>0.00 (0.06)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.01 (0.06)</td>
<td>-0.02 (0.14)</td>
<td></td>
</tr>
<tr>
<td>Peak association</td>
<td>0.25 #</td>
<td>0.24 #</td>
<td></td>
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<tr>
<td></td>
<td>(0.13)</td>
<td>(0.13)</td>
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</tr>
</tbody>
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N 57 57 57
Groups 4 4 4
AIC 126.6 125.9 125.7
BIC 130.7 136.1 146.1
logLik -61.3 -57.9 -52.8

# p < 0.10 *p < 0.05 **p < 0.01 ***p < 0.001

However, it is difficult to generalize these individual case studies and attribute causal effects to certain variables and mechanisms that transcend the cases. The linear mixed effects models presented in Table 1 point out that only the membership in national peak associations has a (barely) significant effect on the number of contacts to other business associations. This is in line with neo-corporatist reasoning that assumes more vertical relationships directed to sectoral and national peak associations. In contrast, the number of competitors does not increase the number of contacts. Niche theory assumes that niche partitioning primarily takes place via negotiated agreements or direct (predatory)
competition between organized business interests. This might have happened in the chemicals domain, where there are few overlaps. However, in the turbulent I&C sector, the clearing of domain overlaps has not been tackled by the year 2002. According to the mixed effects models, the best model fit is obtained, when the intercept as well as some slopes are allowed to vary within the sectoral groups. This indicates unique dynamics and trajectories of each sectoral population.

The GLMM output contains essentially three parts: the model fit, the random and the fixed effects. The model fit is based on the three model fit statistics Akaike’s Information Criterion (AIC), the Bayesian Information Criterion (BIC) and the log-likelihood (loglik). There are random effects for the intercept and slopes with respect to competitors and age (only in model 3) for each associational population. The random effects for the different intercepts (=associational populations) are rather small and indicate a low between population variance regarding the embeddedness of associations. The variance increases when other covariates are also allowed to vary. The fixed effects provide information for the “typical” relationship between response and covariates.\(^5\)

5. Lobbying the European Commission and the European Parliament

The research strategy underlying this paper is twofold. First, the evolution of sectoral populations of business associations and the resulting network structures have been analyzed. It can be concluded that they basically result from national and sectoral idiosyncrasies. The only factor that has a small effect on the formation of these networks has been the membership in national peak associations that increases the embeddedness in sectoral contact networks while newly founded associations have a higher number of competitors.

The second analytical step is to model the effect of the network structure on the lobbying behavior of business associations. As can be seen from figure 3, business associations have on average contacts to two or three different directorate generals of the European Commission. Moreover, about 50% of all sectoral business associations lobby the European Parliament. The variance between sectoral populations and between business associations is

\(^5\) However, the intercept is difficult to interpret since it provides information in case both age and competitors are 0, which they never are at the same time.
large. However, there seems to be a clear sectoral pattern regarding the within group variance. Lobbying behavior is more diverse in the I&C associational populations than between the chemical industry associations.

**Fig. 3: Lobbying the European Commission and the European Parliament**

<table>
<thead>
<tr>
<th>Country</th>
<th>Sector</th>
<th>Contacts to DGs</th>
<th>Contact to EUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>I&amp;C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Chemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>I&amp;C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>Chemicals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to explain these differences in lobbying behavior, I computed several mixed effects models. In the theoretical chapters, I hypothesized that lobbying efforts at the European level are more likely when the business association is older and is a member of a national peak association. It thus has acquired more lobbying experience and material resources.

Tab. 2 and 3 display the results for the lobbying of the European Commission and respectively for the European Parliament. Rather surprisingly, peak associations do not lobby more directorate generals of the European Commission or the European Parliament than other associations. Age has a significant effect on the lobbying behavior as well as the inter-associational relations with regard to the Commission but not the Parliament. This is not surprising since the European Parliament has gained substantive powers only in the 1990s which reduces the effects of age significantly. The country and sector intercept in almost all models is very modest indicating a low variability between associational populations. Most variability is concentrated within populations (see Fig. 3). The same applies also to the other random effects in model 3.
Tab. 2: Explanatory model of lobbying the European Commission (family=poisson, link=log)

<table>
<thead>
<tr>
<th>Random effects</th>
<th>Varying intercept model</th>
<th>Varying intercept model</th>
<th>Varying intercept and slope model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variance (Std.Dev.)</td>
<td>Variance (Std.Dev.)</td>
<td>Variance (Std.Dev.)</td>
</tr>
<tr>
<td>Country and sector (Intercept)</td>
<td>0.08 (0.28)</td>
<td>0.00 (0.00)</td>
<td>0.35 (0.59)</td>
</tr>
<tr>
<td>Number of neighbors * their contacts to DGs</td>
<td></td>
<td></td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>Number of competitors * their contacts to DGs</td>
<td></td>
<td></td>
<td>0.00 (0.01)</td>
</tr>
<tr>
<td>Age (log(2000-founding year))</td>
<td></td>
<td></td>
<td>0.00 (0.07)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.81 (0.17) ***</td>
<td>-0.47 (0.38)</td>
<td>-0.46 (0.49)</td>
</tr>
<tr>
<td>Number of neighbors * their contacts to DGs</td>
<td>0.02 (0.01) ***</td>
<td>0.03 (0.01) **</td>
<td></td>
</tr>
<tr>
<td>Number of competitors * their contacts to DGs</td>
<td>0.03 (0.02) #</td>
<td>0.03 (0.02)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.21 (0.09) *</td>
<td>0.21 (0.10) *</td>
<td></td>
</tr>
<tr>
<td>Peak association</td>
<td>0.15 (0.19)</td>
<td>0.24 (0.20)</td>
<td></td>
</tr>
</tbody>
</table>

N 57 57 57
Groups 4 4 4
AIC 100.9 94.0 110.7
BIC 104.9 106.3 141.4
logLik -48.4 -41.0 -40.4

# p < 0,10   *p < 0,05   **p < 0,01   ***p < 0,001

Competitive relations between business associations increase lobbying efforts. Business associations that are surrounded by other associations that share the same interest domain and that have a high number of contacts to the European Commission also increase their lobbying efforts directed at the Commission. Similarly, if a business association has contacts to other associations that have many contacts to the European Commission, then the association also has more contacts to the Commission. The same holds also for lobbying efforts directed at the European Parliament. The varying intercept model with the fixed effects parameters clearly has the best AIC. The varying slope model, in contrast, has much
more parameters in the model without significantly improving the model fit. This means that the slopes for each variable do not vary much between populations and adding an additional random effects term is unnecessary.

### Tab. 3: Explanatory model of lobbying the European Parliament (family=binomial, link=logit)

<table>
<thead>
<tr>
<th>Random effects</th>
<th>Varying intercept model</th>
<th>Varying intercept model</th>
<th>Varying Intercept and slope model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variance (Std.Dev.)</td>
<td>Variance (Std.Dev.)</td>
<td>Variance (Std.Dev.)</td>
</tr>
<tr>
<td>Country and sector (Intercept)</td>
<td>0.23</td>
<td>0.00</td>
<td>2.47</td>
</tr>
<tr>
<td>Number of neighbors * their contacts to EP</td>
<td>0.48</td>
<td>0.00</td>
<td>1.57</td>
</tr>
<tr>
<td>Number of competitors * their contacts to EP</td>
<td>0.02</td>
<td>0.00</td>
<td>0.15</td>
</tr>
<tr>
<td>Age (log(2000-founding year))</td>
<td>0.41</td>
<td>0.00</td>
<td>0.64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
<th>Estimate (Std. Error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-0.03</td>
<td>-2.97 *</td>
<td>-3.27 *</td>
</tr>
<tr>
<td>Number of neighbors * their contacts to EP</td>
<td>0.36</td>
<td>1.21</td>
<td>1.55</td>
</tr>
<tr>
<td>Number of competitors * their contacts to EP</td>
<td>0.45 **</td>
<td>0.51 **</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.14</td>
<td>-0.06</td>
<td>0.47</td>
</tr>
<tr>
<td>Peak association</td>
<td>0.49</td>
<td>0.50</td>
<td>0.37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Groups</th>
<th>AIC</th>
<th>BIC</th>
<th>logLik</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57</td>
<td>4</td>
<td>82.2</td>
<td>86.3</td>
<td>-39.1</td>
</tr>
</tbody>
</table>

*p < 0.10  **p < 0.05  ***p < 0.01  ****p < 0.001

### 6. Conclusion

This paper scrutinized the evolution of sectoral associational networks and analyzed the network effects on organizational behavior, in particular lobbying efforts directed at the
European Commission and Parliament. The study is based on 57 German and British business associations\(^6\) from the information and communications sector (I&C) and from the chemicals sector.

Two factors account for evolution of associational networks. Regarding the contact network between associations, peak associations occupy a central position within all four associational networks. This is in line with neo-corporatist reasoning. However, in neither case have peak associations established an informational hierarchy, they are rather “primi inter pares”. Domain overlap between associations basically exists between newly established associations. Niche theory explains this pattern by invoking niche partitioning mechanisms in particular competition and coordination.

The second part of the paper was concerned with the effects of network structure on organizational behavior of business associations. It turned out that embeddedness had an effect on the number of contacts to directorate generals of the European Commission and to the European Parliament. Business associations that have contacts to other associations which have many lobbying contacts to DGs, also have many contacts to DGs. The same applies to lobbying contacts to the European Parliament. Business associations with contacts to the European Parliament trigger lobbying efforts by other associations to which they have contacts. Competitive pressures increase isomorphic tendencies within associational populations. Furthermore, there also exists some sort of liability of newness, in that newly established associations have less contacts to European institutions than older associations.

References


\(^6\) These are the most important sectoral business associations in the year 2002.
Bates D, Maechler M, Bolker B. 2011. *Linear mixed-effects models using S4 classes*. Package ‘lme4’ (Version 0.999375-39)


