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An Endogenous Policy Approach

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Abstract

Resorting to political economy approaches, this paper attempts to associate the industrial structure in the European Union (EU) to the coalition formation process between European member states. Using a well-known measure of relative voting power, the (normalized) Banzhaf power index, we relax the common assumption that coalitions form randomly. Instead, we adopt the standard interest group model and look at the structure of European industry, mainly in terms of industrial concentration in the EU, as an indicator of its lobbying influence on domestic politics and governments' preferences. This, in turn, influences the political stance, and thus the coalition building process, of the different member states in the Council. We derive estimates on members' relative influence within the Council for different policy areas in the broader framework of industry and trade, on the basis of both weighted votes and likely patterns of coalition-formation in the Council.

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1. Introduction

With the deepening and the further enlargement of the European Union (EU), considerable attention has been dedicated to the decision mechanisms and the institutional aspects of the EU. A group of studies has focused on the decision-making procedures using the spatial analysis of voting (Tsebelis 1994, Garrett and Tsebelis 1996), extended and partially corrected by Moser (1996), or the spatial theory of voting in addition to extensive-form games (Steunenberg 1994, Crombez 1996, Laruelle 1997). Whereas results in these studies vary quite largely, a common thread is the attempt to assess the influence of actors and institutions in the EU's decision-making framework. Analyses purely based on the spatial analysis of voting tend to assume a very specific distribution of actors' preferences, whereas those in the latter category, for example the work by Laruelle (1997), allow for different configurations of the preferences of actors. Institutional structures, similarly, are viewed as important in the framework of n-person cooperative approaches.

As a sub-category of this latter approach, under the overall title of "voting power analysis", different techniques are rather apt to illustrate effects of weighted voting systems. In particular, approaches in this tradition have the merit of outlining the distinction between voting weights on the one hand, and voting power and resulting political influence on the other hand (e.g., Widgrén, 1994b). Such considerations are relevant not least for analyses of decisions by the Council of the EU (earlier called the "Council of Ministers"), where the issue of voting weights for the EU member states and the adequate "quota" to be applied (the "threshold" for reaching decisions) figure among the prominent issues in the view of forthcoming enlargement[1]. Earlier studies, preceding former rounds of enlargement, include Brams (1985), Hosli (1993), Widgrén (1994a), Johnston (1995a), Lane and Maeland (1995) and Peters (1996a). Raunio and Wiberg (1998) provide a newer study in this framework, as similar issues have to be resolved again before the next (major) round of EU enlargement is to take place. One of the main insights provided by such more 'standard' measures of voting power as derived by n-person cooperative games rests on the relatively greater influence (i.e., voting leverage as translated into political power) of the group of smaller countries over the larger ones in the course of the EU's history (e.g., Hosli 1993; Widgrén 1994a). Other main results indicate paradoxes of voting power, especially when small members gain absolute voting power upon enlargement, instead of being affected by the proportional decline for everybody (e.g., Brams and Affuso 1975, 1985)[2]. Similarly, assuming certain a priori coalitions, it has been found that the predominance of the Franco-German axis in terms of aggregate voting influence has tended to decrease rather than increase over time (e.g., Hosli 1996).

Recently, the analysis of voting power has also been applied to the European Parliament (Lane and Maeland 1995, Lane *et al.* 1996, Peters 1996a, Raunio 1996,

[1] In this respect, voting power analysis could also shed light on the reform of the decision-making process within the Council. For a recent general discussion, see Best (1999).

[2] A prominent example is Luxembourg which, at least in formal terms, gained influence in the framework of qualified majority votes with the 1973 enlargement of the Community. Before that, as Luxembourg was entitled to only one vote, the qualified majority threshold was twelve and all other countries held an even number of votes, Luxembourg was de facto powerless when it came to being crucial to the fate of a winning coalition.

1997, Colomer and Hosli 1999, Hosli 1997, 1998). The interaction between EU institutions can also be studied along this approach. For instance, Bindseil and Hantke (1997) and Laruelle and Widgrén (1997) investigate the power distribution among actors, considering the position of the Council, the European Parliament and the Commission, in the framework of different decision-making procedures. Both of these studies confirm the predominance of the Council in the distribution of power among member states[3].

Quite generally, a priori indices of voting power aim to illustrate the influence of actors deriving from weighted voting schemes. In their more traditional forms, they do not attempt – as this sometimes appears to be assumed – to provide a measure for the "effective power" of actors in a specific policy situation and policy domain. This latter aim can generally better be pursued by approaches related to the spatial theory of voting, assuming specific constellations in the distribution of preferences among actors and institutions. Hence, put briefly, the spatial analysis of voting, extensive form games and n-person cooperative games may illustrate different aspects of the EU's institutional framework. Each approach may benefit from insights generated by the other.

Standard power indices, among the more famous ones the Banzhaf (Banzhaf 1965) and the Shapley-Shubik index of power (Shapley and Shubik 1954), hence do not "ignore" preferences. They may rather deliberately abstract from them: when deciding on new institutional structures, actors basically agree on an "incomplete contract" (Widgrén 1999), not knowing what preferences they will have in the future, hence acting behind a "veil of ignorance". In the ideal case, this may also induce fairness in the sense of Rawls (1971)[4].

By contrast, when looking at very specific policy fields and focusing on a more limited time period, it may be easier to assess or predict the distribution of actors' preferences. Although few systematic data collections still exist on the preferences of actors and institutions in the EU's decision-making procedures, and there may be debates with regard to the origins and stability of such preferences and the sincerity with which they are revealed, predictions of policy outcomes are certainly easier for situations in which preferences can be assessed more accurately.

Hence, in domains in which specific preferences can be assumed with some satisfactory degree of reliability, a common criticism rests on the somewhat mechanical nature of the more usual voting power models, namely that coalitions are assumed to be formed randomly (corresponding to the a priori nature of these indices). The fact that all possible winning coalitions are envisaged and treated as having the same probability of occurrence, in the a priori perspective, obviously does not capture the essential elements of the day-to-day political process. For instance, the agenda-setting power of the Commission and the influence of the member states indirectly affect the coalition formation process. Moreover, trade-offs across issues and "vote-trading" rule out possible subsets of coalitions[5].

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[3] See Kirman and Widgrén (1995) and Widgrén (1996) for an analysis focusing on the relationship between the Council and the Commission.

[4] On power indices and a "fair" distribution of voting power for the Council of the EU, see Laruelle and Widgrén (1998).

[5] For a debate on the relevance of the power index approach, see the critiques by Garrett and

As a consequence, some authors have attempted to reconcile spatial analysis with n-person cooperative game theory and work with more restrained assumptions about possible coalition-formation as applied to the EU (Kirman and Widgrén 1995, Widgrén 1995, Hosli 1996, Peters 1996a and Winkler 1998). A straightforward method, at least in analyses applied to the Council, consists in defining a priori coalitions based on assumptions of country preferences. Hence, Kirman and Widgrén (1995) and Widgrén (1995) impose coalition structures among member states to analyse the voting power of each country in different policy areas (such as trade policy, the common agricultural policy, regional policies and social regulation). Of course, as highlighted by Winkler (1998) in the context of an analysis of upcoming EU enlargement, the prevailing coalition structure is of crucial importance in estimating the voting power of member states in the Council.

An alternative approach that can be envisaged is based on the concept of "connected coalitions". This is linked to Robert Axelrod's crucial work *Conflict of Interest* (1970), assuming that where members are ranked on a preference continuum, only adjacent (contiguous) members will form winning coalitions. This approach is basically applied in Colomer and Hosli (1999) in an analysis of voting power of Political Groups in the European Parliament (political parties being ranked on an ideological left-right policy scale). Colomer (1999) calls this index the "legislative index", as it is apt to analyse situations, such as in parliamentary settings, where members can generally be located on a respective policy scale with some accuracy. When analyzing the Council, by contrast, such scales are generally more difficult to establish, as member states may form coalitions on the basis of criteria such as geographical proximity, similarity in economic structure, ideology, language, culture or other factors.

Nonetheless, this paper departs from an assumption related to the "legislative index". As little is still known on the actual distribution of the preferences of crucial actors in the Council and in the EU's inter-institutional process more generally[6], we are interested in studying how domestic factors may constrain or reinforce specific patterns of coalition-formation among member states in the Council, especially in the industrial and trade policy domains. The theoretical foundation of the approach rests on the "interest group model" – a political economy tool to assess the degree to which governments are pressured by specific lobbying groups. We abstract here from the influence of other institutions in the EU's framework − an analysis that could derive from and expand the work presented here, but is more complex, as more actors and uncertainties are involved − and restrict our analysis to assumed patterns of behaviour among member states in the Council.

We find that in the domain of trade and industrial policy, specific coalitions between EU members are more likely to form. Rank-ordering the EU members on scales that assess the relative degree of industrial concentration or trade openness, we

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Tsebelis (1996, 1999a,b) and the responses by Lane and Berg (1999) and in particular Holler and Widgrén (1999).

[6] Some information on preferences of actors − mainly as voiced in the framework of the Council − is contained in the edited volume by Bueno de Mesquita and Stokman (1994). New efforts at data-collecting in the framework of the EU based on this preliminary crucial collection may help strengthen and update the relevant information.

find that generally, "centre players" are indeed privileged in the framework of qualified majority votes as compared to what their influence based on the distribution of weighted votes and the voting "quota" would be (i.e., as compared to more regular assessments of a priori voting power). That is, they will generally be more likely to be crucial to the fate of a "winning coalition" of EU members in the Council. Evidently, this kind of analysis can only be applied to specific policy areas in which the rank-ordering of members on such a scale is assumed to be known.

In order to study these crucial issues, we structure the article as follows. The subsequent section describes a technique to assess "voting power" in the framework of "connected coalitions". Section three provides an overview of our data which help us derive members' preferences. This section also presents the empirical results of the paper. Section four summarizes and concludes.

2. A Power Index for "Connected Coalitions"

Voting power analysis, as indicated above, generally assumes that all coalitions considered to be possible among members are equiprobable. They are especially interested to show how weighted voting schemes as used in different institutions privilege or discriminate members[7]. The perspective is one of a priori analysis, especially suited to illustrate changes by altered or enhanced membership, as actors do not generally know where on a "policy scale" they would be located on future decisions. In the framework of the Banzhaf power index, every coalition among players is basically considered to have the same probability of occurrence. A player is called *marginal*, *swing*, *pivotal* or *critical* if it is able turn a losing coalition into a winning one (or *vice versa*) on the basis of its vote. The non-normalized Banzhaf index of voting power, in which players are assumed to either vote "yes" or "no" independently from each other, counts the number of respective "swings" for each player and compares them with the total number of feasible coalitions (combinations) among the players. Normalization of the index is derived by dividing the number of times player i is critical for the fate of a coalition as compared to the sum of the critical defections for all players. Accordingly, let η_i be the number of winning coalitions in which i is critical. The (normalized) Banzhaf power index for player i, denoted by β_i, is then defined as

$$\beta_i = \frac{\eta_i}{\sum_{i=1}^{n} \eta_i} \qquad (1)$$

The Banzhaf vector of a game is the vector $\beta = (\beta_1, \beta_2, ..., \beta_n)$.

In the context of another widely used index, the Shapley-Shubik index, it is every possible ordering in which players can join a coalition that is considered to be equiprobable. This can be interpreted, in a more applied setting, in the sense that members may, according to their location (and intensity) of preference, join coalitions

[7] Note that voting power indices have also been used to investigate the political economy of country decisions in other international institutions such as the International Monetary Fund (see Leech 1998, Rapkin, Elston and Strand 1997, and Strand 1999).

in sequence, with the "pivotal player" then turning a "losing coalition" into winning. The Shapley-Shubik index for player i is calculated as follows:

$$\varphi_i(v) = \sum_{S \subset N} \frac{(s-1)!(n-s)!}{n!} [v(S) - v(S - \{i\})] \quad (i \notin S) \qquad (2)$$

where s denotes the number of players in coalition *S*, *n* the total number of players in the player set N and [v(S) - v(S-{i})] the marginal contribution of player i to the coalition S. If player i s the pivot, v(S) = 0 ($i \notin S$), but $v(S \cup i) = 1$.

Other approaches to assess relative voting power exist, for instance those assuming that the derived payoff of a coalition constitutes a public rather than a "private" good (on the development and variants of this index, see Holler 1998). Without restrictions on the assumption of "viable" coalitions, the total of possible coalitions among members is 2^n (without the empty set, it is 2^n-1). By contrast, the number of possible permutations is n!. For example, in the case of a three player committee, the total number of possible coalitions (containing a minimum of one player), without assuming restrictions on the set of feasible coalitions, is 2^3 -1 = 7, but there are 3 x 2 x 1 = 6 ways to rank-order the actors.

In applied settings, the formation of coalitions will not be a random development. Rather, it is part of a complex political process, constrained by institutional, sociological, ideological, historical, cultural and economic factors, and by agenda-setting**.** When trying to assess the actual influence of actors in the framework of single decisions, more regular variants of power indices may hence not be a suitable tool. In order to gain some more insights from the voting power models for the analysis of "influence" in specific policy domains and situations, it is therefore interesting to look more closely at the coalition-building process. In other words, the challenge is to constrain, or somewhat predict, the behaviour of political agents in their cooperative efforts to form a coalition.

Several extensions to more standard approaches in the voting power framework have been made that account for the fact that some members are more likely to form coalitions. Apart from work mentioned above, Owen (1977) has extended the Shapley-Shubik index to situations in which *a priori* unions are considered to exist. Owen (1982) applies a similar extension to the Banzhaf power index.

More generally, two different approaches to restricting the set of possible coalitions can be envisaged. The first approach rests on an observation of members' revealed preferences (as expressed by their voting behaviour for instance). That is, the past position of members is observed in order to infer their future behaviour. In the case of decisions taken by the Council, such an approach would consist in gathering information (e.g. vote recordings) on the position of each member state on a set of issues and assess their belonging to coalitions.

Although past behaviour does not constitute a perfect indicator of future positions (in particular in the case of new issues which have no precedents, or in the presence of package deals), this approach has the advantage of being "realistic" in the

sense that it does not depend so much on assumptions or theoretical presumptions about likely behaviour, apart from the hypothesis of stable coalition blocks over time. It also allows to measure the "real" voting power of political agents over a specific period and on a determined set of issues (as captured by the data on voting positions).

Without doubt, such an empirical approach would be worth pursuing. At the EU level, however, a major difficulty arises from the lack of transparency of the decision-making process. In particular, decisions by the Council seldom result in a formal vote, but are rather taken by consensus (or without a vote when no obvious blocking minority has formed)[8]. Moreover, even when the Council proceeds to formal voting, the positions expressed by member states are usually already the result of a long negotiation process that often entails "horse-trading" and compromises between coalitions. So, Council votes tend to reflect the final outcome of an extended chain of discussion and transactions between member states and coalitions, and serve more often as a platform for governments to publicly express their reservation or opposition to a project rather than as a means to signify their true position. That is, if the respective position of each member state is known to all within the Council before a formal vote takes place, why would a minority member state cast a vote against the majority knowing it is doom to lose anyway, unless it wants to make public its disagreement. Therefore, most of the time, formal votes at the Council level merely represent the tip of the iceberg of the coalition-building and decision-making process.

The second approach to determine an a priori distribution of preferences among members is based on predictions of each member's preferences. To this end, the theory of public choice can help make forecasts on the behaviour of decision-makers. It is a well-known phenomenon that interest groups influence the determination of public policy[9]. Indeed, contrary to a common assumption in more standard economic models, governments are not benevolent actors trying only to maximize the common welfare, but are also responding to specific-interest pressures (as recognized by the political economy literature, especially in the "public choice" framework)[10]. In particular, sector-specific policies are especially prone to be influenced (if not "captured") by interests groups (chiefly producers and labour organizations, and to a lesser extent consumers). The standard example of a policy field subject to intense sector-specific lobbying is trade policy[11]. Lobbying also targets other policy instruments such as subsidies, price and "conduct" regulation or tax schemes, affecting the main sectors of the economy (such as agriculture, steel, automobile, transport, chemical and pharmaceutical products or banking). General policies affecting labour, environmental and social standards are also commonly

[8] Indeed, although empirical evidence is scare, it seems that about 80% to 90% of Council decisions are settled at the level of COREPER (Committee of Permanent Representatives), or even at the level of working groups (the so-called A point decisions). See Mentler (1996:139) and Hayes-Renshaw and Wallace (1997: 40).

[9] For a recent survey of the empirical literature on interest groups, see Potters and Sloof (1996). For a survey of the general literature on EU-lobbying, see Andersen and Eliassen (1997).

[10] For a classic study on interest groups, prospects for "collective action" and the provision of public goods, see Olson (1965). These issues are also treated extensively, from a public choice perspective, in Mueller (1989).

[11] For an overview of the political economy of trade, see Hillman (1989), Rodrik (1995) and Magee (1997).

subject to pressures from interest groups.

Ceteris paribus, countries with a similar industry structure or characteristics will be subject to similar pressures from specific-interest groups. While the demand for and the supply of policy obviously depend on many institutional factors (see Bilal 1998a,b in the case of trade policy), the interest group model predicts that such countries tend to exhibit convergent preferences. Hence, in a multi-player decision-making process, they will be more likely to form a coalition.

The interest group model is the approach adopted in this paper[12]. The focus of the analysis here is also restricted to policy outcomes, defined quite broadly, in the domain of the EU's industrial and trade policy. For decisions in the EU more generally, it may be assumed that the broad range of issues on which decisions are made – ranging from environmental policy to agriculture to the liberalization of financial markets within the EU's pillar one, and to foreign and security policy and matters of justice and home affairs in pillars two and three, respectively – leads to a constellation of preferences in which several "rank-orderings" among members are possible in practice. Accordingly, it would be more difficult to talk about "connected coalitions" in the latter context, whereas it is easier in the former.

Hence, the reduction of the focus to basically one broad policy field certainly provides more justifications to restrict the assumptions with respect to plausible coalitions. Specifically, we will assume that EU governments will most likely join a "coalition" within the Council's deliberations – or in the framework of bargaining procedures in the COREPER or working groups related to this institution – on the basis of some variables that characterise their country's industrial and trade structure. On the basis of the predictions derived from the interest group model, we then make the assumption that EU governments will build coalitions among members that are "adjacent" on the given (ordinal) scale, essentially forming "connected coalitions" (Axelrod 1970, and Garrett and Tsebelis, 1996).

Formally[13], we consider a voting game on the set of players N={1,2,...,*n*} in which certain coalitions are excluded a priori, here according to the conflict of interest theory (Axelrod 1970)[14]. In the context of a simple game G=(N,W), where W denotes the set of winning coalitions and N the set of players, let p_i denote the policy position of player $i \in N$ and P the set of all policy positions (Van Deemen 1997:140). Θ denotes a policy order satisfying the three basic conditions of anti-symmetry, completeness and transitivity[15]. A player $i \in N$ is to the left of player $j \in N$ iff $p_i \Theta p_j$. Conversely, player $i \in N$ is to the right of player $j \in N$ iff $p_j \Theta p_i$. Van Deemen (1997:140-41) provides an overview of concepts needed to formulate the conflict of interest theory in the framework of the policy game G_Θ: (i) a player k is located between players i and j iff $(p_i \Theta p_k \wedge p_k \Theta p_j) \vee (p_j \Theta p_k \wedge p_k \Theta p_i)$[16]; (ii) two players i and j are neighbours iff there is no

[12] Note that other approaches could also have been used to determine member states' preferences, such as political ideology or geographical proximity for instance.

[13] Compare Berg and Perlinger (1999), who provide a theoretical background for the calculation of the Shapley-Shubik index on the basis of connected coalitions.

[14] Note that De Swaan (1971) has called this approach the "closed minimal range theory".

[15] On these conditions, see for example van Deemen (1991: 145) and van Deemen (1997: 22).

[16] The logical symbols used here are $\wedge$ ("and", conjunction) and $\vee$ ("or", inclusive disjunction).

other player *k* between *i* and *j*; (iii) a coalition $S \subseteq N$ is closed iff for all $i \in S$ there is a $j \in S$ such that *i* and *j* are neighbours; (iv) a coalition which is not closed is open.

Following the logic of this approach, a winning coalition which is closed and minimal in the sense "that it can lose no member party without ceasing to be connected and winning" (Axelrod 1970:170) will have a minimal conflict of interest, and these are the coalitions that are predicted to form in the framework of this approach (Van Deemen 1997:141). Hence, W^{cl} is the set of closed and winning coalitions in the respective policy game. This set is the basis for the calculation of the index used in this paper.

Because information on actual preferences as voiced in the framework of the Council is practically unavailable, for the reasons outlined above, we assume that data on industrial concentration and trade, linked with assumptions about lobbying group activities, provide rough estimates on governments' preferences as advocated in the intergovernmental framework. Hence, we derive estimates on members' preferences based on empirical data of the domestic structure of industry and trade. In the context of these rank-ordered, "connected" coalitions, a member is then considered to be "pivotal" (or "critical") if it can make a coalition lose on the basis of its voting weight by defection, according to the formal characteristics as outlined above. Therefore, the expected power of a member in the Council will vary with two main characteristics: (1) its position in terms of being either "extreme" or more "central" on a scale that rank-orders members' preferences, and (2) its voting weight.

For example, in the case of the EU, a member holding three votes in the Council (such as Denmark, Finland or Ireland) in the framework of qualified majority votes cannot make a coalition of (adjacent) members on a specific scale lose by its defection when the sum of the weighted votes of the coalition members including itself totals at least 65 (as the actual "threshold" for a qualified majority vote to pass is currently 62 votes)[17]. By contrast, within such a coalition, a large or middle-sized EU member may render the coalition losing by abandoning it. Hence, while we assume that only "connected coalitions" among members on a specific scale will form, actors' actual voting leverage in this framework is determined by both their position on the scale and their size in terms of voting weight. Accordingly, for the policy game $G_\Theta = (N,W^{cl})$ let ξ_i be the number of times player i is critical to the fate of a connected winning coalition. The (normalized) Banzhaf power index for connected coalitions for player i, here denoted by γi, is then defined as

$$\gamma_i = \frac{\xi_i}{\sum_{i=1}^{n} \xi_i} \qquad (3)$$

A simple example can illustrate how we proceed in practice to derive members' relative voting leverage on the basis of this approach. Assume a three-member committee in which players A, B, and C can be located on a "left-right policy scale". B is the centre player, C is located on the right of the scale and A on the left.

[17] Respecting the "Ioannina compromise", however, the relevant quota might be 65 votes in practice.

Assume, in a simple example, that A holds four votes, B three, C two and the decision rule or "quota" is a simple majority of the total vote (i.e., five). If we assume that only "connected coalitions" will form, the following coalitions are "viable": {A}, {B}, {C}, {A,B}, {B,C} and {A,B,C}. Coalition {A,C} is possible in the framework of general assessments of voting power, but it is "non-connected". Considering members' voting weight, the three one-member coalitions above are no winning coalitions, as they do not reach the threshold required to pass the decision. In the framework of the (connected) winning coalition {A,B}, either of the two players can render the coalition losing by defecting. Hence, both A and B are attributed a "critical defection" to calculate the power index for connected coalitions (or the "legislative index"). Similarly, in the framework of the coalition {B,C}, either of the two players is "critical". By comparison, in the framework of the "grand coalition" {A,B,C}, which encompasses all committee members, none of the players is "critical" to the fate of the coalition, as the defection by any single actor still keeps the coalition winning. In the framework of this simple example, the calculation of "critical defections" for each player then leads to the following results: A and C are "critical" in one coalition, but the "centre player" B in two. Assessed in this way, the "centre player", in the context of connected coalitions, tends to be more influential than players located to its left or right on the respective scale[18]. Hence, players with a moderate position (i.e. "centre players") appear to enjoy a greater power than "extremist" players[19]. Yet, more generally, an actor's influence not only depends on its position on the scale, but also on its "weight" in the committee. In the example above, relative voting power, as assessed by the "legislative index", is then attributed in the proportion A:B:C = ¼ : ½ : ¼. That is, despite its large voting weight, member A has less influence than the centre player and is equal in terms of relative voting power with the player located on the right of the scale.

Another example illustrates the importance of assuming that only connected coalitions will form. If in the three-member committee above, with rank-ordering A-B-C, each member held one vote (the decision quota being two), disregarding coalition {A,C} leads again to a power assessment of ¼ :½ :¼ to players A, B and C (instead of providing equal voting power to all players as in the case of "regular" power indices), because in the framework of the "legislative index", only the (winning) coalitions {A,B,C}, {A,B}, {B,C} are considered to be viable.

This way of assessing relative influence will now be applied to different ordinal policy "scales" considered to be relevant for decisions in the Council in selected policy domains. We thus assume that players located in adjacent "slots" on a rank-ordered scale – e.g., on the basis of the degree of industrial concentration in a

[18] Similarly, in the framework of the Shapley-Shubik index as modified in an analogous manner, different rank-orderings of players starting from either the lower part or the upper part of the scale, will lead to one player being "pivotal" in practice (the one reaching the 62 vote hurdle in the build-up process towards the "grand coalition"). For an extension of the Shapley-Shubik index to connected coalitions, see Berg and Perlinger (1999).

[19] As observed by Garrett and Tsebelis (1999a), a non-connected power index suggests a greater influence of governments with extreme preferences than a connected power index does. However, Holler and Widgrén (1999) illustrate that a "critical defection" of a member in the center of the scale may not be a "credible" move. Hence, they argue, players at the extreme ends of the scale would rather win power when Garrett and Tsebelis' assumption is considered to be correct.

respective domain − will presumably be equally much under the influence of lobbying group activity and voice similar preferences on the intergovernmental level. Whether an issue will concern more openness or more protection in a policy field, more "integration" or less, members will be likely to have similar interests when being "adjacent" players on the scale. Among those forming a connected coalition in such a context, there is assumed to be bargaining leverage, as only those members are part of the potential winning coalition[20].

In addition to these calculations, we provide figures on the probability of members to be included in winning coalitions on the basis of their "location" on the policy scale. In an adaptation from an "inclusiveness index" described by König and Bräuninger (1997a), we will here use this index in the framework of the policy game $G_\Theta = (N,W^{cl})$. Formally, denote the number of times that player i is a member of a connected winning coalition by λ_i. The (normalized) inclusiveness index for connected coalitions for player i, ψ_i, can then be expressed as

$$\psi_i = \frac{\lambda_i}{\sum_{i=1}^{n} \lambda_i} \qquad (4)$$

Calculations for this additional index, generally, will be somewhat different from the calculations on the (modified) power index. Generally, members at the "flanks" of the policy scale will be represented less frequently in winning coalitions than those in the centre of the scale, but they will, in general, nonetheless have a positive probability of being included. In this additional analysis, voting weights will generally play a less important role as compared to voting power analysis: in this assessment, it is not a member's capacity to be "pivotal" that matters, but a member's capacity to be included in a coalition meeting the decision quota. Generally, the location of a member's policy preference on the scale will be essential to this analysis.

The calculations for this additional figure can be illustrated for the example discussed above, in which three members are located on a policy scale, from left to right, in the order A-B-C. The simple majority rule applies and member A holds four votes, member B three and member C two. Only {A,B,C}, {A,B} and {B,C} are viable winning coalitions (coalition {A,C} would be a winning coalition in terms of size, but is non-connected). Whereas in the framework of the "grand coalition" {A,B,C}, no member can make a "critical defection" – hence, when a member departs from the coalition, the remaining voting weights are still sufficient to meet the required quota − all three members are *included* in this winning coalition when it forms. Hence, member A is included in two out of three possible winning coalitions, as is member C, but member B is included in all of them. By deviding the number of

[20] A few cautious remarks may need to be applied here, however: will players in all circumstances have "incentives" to leave such a coalition? The threat of a "critical defection" might at times be applied "strategically" in this context, i.e., actors may aim to obtain a policy result that is closer to their own actual preference by threatening to defect. Generally, if ideal points of actors are close, adjacent members on such a scale should have less incentives to leave a connected coalition (on this aspect, see Holler and Widgrén 1999). Hence, in this framework, members may have increased incentives to misrepresent their true preferences.

times a player is included in a connected winning coalition by the total of possible inclusions for all members, we derive "inclusiveness indices" for the players in the proportion $^{2}/_{7}$:$^{3}/_{7}$:$^{3}/_{7}$. Accordingly, the "extreme players" on the scale will, in general, be more often included in a winning coalition than "pivotal". Members in the centre of the scale, moreover, may obtain similar indices with respect to their relative degree of "inclusiveness".

In an extension to both of these approaches, depending on the location of the status quo (and on inter-institutional dynamics), only specific winning coalitions will be able to form. While we do not want to restrict the analysis here to a specific location of the status quo and position of other EU institutions, we are able to say that a "critical defection" will only be possible among a set of connected members on a scale. "Defection", in this framework, will then be on the basis of voting weight. Similarly, "inclusion" **is** assessed in the context of connected coalitions on the basis of both voting weight and a member's position on the policy scale.

3. Industrial Structure, Trade and Coalition-Building

Depending on the relative extent to which lobbying interests might be reflected in governments' preferences, and the variable or "scale" considered to be crucial for the determination of the coalition-formation process among EU governments, we expect to obtain different outcomes in terms of the relative influence that members or clusters of members can exert in the Council's overall decision-making process.

3.1. Industrial structure

A crude economic indicator of the political influence of industries is the share of employment by large firms (i.e. with over 250 employees), since they are the ones assumed to be the most politically active[21]. In countries such as Belgium, Finland, the UK and Germany, where employment is highly concentrated within large companies (i.e. over 40 percent of the labour force), the interest group model would predict that politicians are more subject to industry lobbying, and thus more prone to defend industrial interests, than in countries like Spain or Greece, which are largely dominated by small and medium size enterprises (SMEs employing over 80 percent of workers). It follows that, on industrial issues, coalitions between top ranking member states (e.g. Belgium, Finland, the UK, Denmark and the Netherlands) on the one hand, and between low ranking countries (e.g. Portugal, Italy, Ireland, Spain and Greece) on the other, are more likely than coalitions between dissimilar countries (such as Belgium and Greece, for instance). More generally, countries with similar industrial structures are more likely to be subject to similar industrial pressures, and thus to form a coalition with members holding similar preferences than with very different

[21] The main rationale is that it is easier for a few large firms to get organised and lobby effectively than for a high number of small firms, as the former are generally better able to control the free rider problem (Olson 1965). Besides, to the extent that labour is better organised in large firms, it is also expected to be more influential in its lobbying activities. On the role of labour in lobbying for trade policy, see Cadot *et. al.* (1997) and Rama and Tabellini (1998) for recent theoretical developments, and Olarreaga *et. al.* (1999) for an empirical study.

countries[22]. Column 2 of Table 1a provides an overview of the respective rank-ordering of members on this measure.

How much influence do member states in the Council have when coalitions build among countries similar on this characteristic? Table 1a provides information on results when the methodology as described above to assess the "legislative index" is applied. In order to allow for comparison, the last column of the table also provides figures for the (regular) assessment of the (normalized) Banzhaf index in the framework of the qualified majority decision rule.

[Tables 1a and 1b about here]

If the employment share of large firms is considered to matter, we find that Germany, the Netherlands, France, Portugal and Italy, all located relatively in the "centre" of this scale, are likely to be favoured in the coalition-formation process. By contrast to countries either less likely to be pressured to this extent, such as Greece, Spain and Ireland, or those showing a strong proportion of employment share by large firms (such as Belgium and Finland), those in the middle of the scale are, on average, more likely to find their policy views accepted.

This latter point is supported by the findings that the "inclusiveness index" generates (table 1b). The countries located in the middle of the scale, from Germany to Italy, find their policy views, expressed in probabilistic terms, included in a winning coalition in about 8 percent of all cases, whereas those located at the "extreme ends" of the scale, especially Belgium and Greece, are less well represented.

Of course, looking at the broad industrial structure cannot account for the variety of often conflicting interests within the national business community. Assume that the political influence of a sector is reflected by its size (in terms of employment). For the sake of simplicity, consider a crude division of national economies into four major sector areas, namely (i) energy, extraction and manufacturing industry, (ii) construction, (iii) trade and hotels and catering, and (iv) transport, communication, and financial services. It is clear then that the ranking of member states by sectorial employment share, as shown in Table 1a, differs for each sector area, with no identifiable patterns, thus suggesting that coalition building really depends on the sector concerned.

For decisions related to energy, extraction and manufacturing, we can see that among the countries privileged in the coalition-formation process are especially Austria, Italy, France, Belgium, Sweden, Spain and the Netherlands. To a more moderate extent, this is also true for Denmark and the United Kingdom. By contrast, countries at the extreme of the scale, either at the top, like Germany, Portugal, Finland and Ireland, or at the bottom, like Luxembourg and Greece, may be at a relative

[22] Analyses resorting to the technique used in our study could potentially be extended assuming that specific coalitions only form with certain a priori probabilities. For certain country groupings or a priori unions, this assumption is also made by Kirman and Widgrén (1995) and by Hosli (1996).

disadvantage in this domain. In the domain of construction, EU members experiencing a relatively stronger political influence due to their position on the respective "scale" are especially Ireland, Portugal, Austria, Denmark, the Netherlands, Belgium and Greece. By contrast, countries at the extreme ends of the scale, including Finland, the UK and Spain, are in a much weaker position than in an average of other policy fields (i.e., as compared to the "regular" normalized Banzhaf index of power). In this example, the bargaining leverage of Luxembourg, as expressed by the power index for connected coalitions, is zero (as it can make no coalition among members lose on the basis of its voting weight), but its preferences may nonetheless be included in winning coalitions (as its "inclusiveness index" of 2.17 percent indicates).

Similarly, in the sector of trade and hotels and catering, countries ranked from the third to the eleventh position enjoy a relative strengthening of their power (compared to the regular normalized Banzhaf index), with the exception of Spain which ranks fifth. Likewise in transport, communication and financial services, countries ranked third to tenth have a relatively stronger influence than general assessments of voting power would predict. Again, the "inclusiveness index" indicates that in general policy views of these same members will be reflected relatively often in policy outcomes (table 1b), with actors in this context being rather "lucky" than "powerful" (see Barry 1980).

Tables 1a and 1b deserve several general comments. First, as expected, the ranking and hence the influence in coalition-building of countries depend on the sector concerned. Note that to be fruitful, however, the analysis by sectors may be even more refined so as to reflect the diversity of industrial interests[23]. We will address this issue below by looking at one sector that is characterised by a high degree of concentration: the automobile industry. Second, countries in the centre of the preference scale tend to have a relatively greater political influence, and are more frequently included in winning coalitions, as they are more often a member or even critical member of a connected coalition, than the ones at the extreme. However, the voting weights of the country and of its connected partners play a critical role to determine its political influence.

Yet, the power index for connected coalitions, abstracting from the intensity of preferences, does not account for the possibility that countries at the extreme may have stronger preferences. Hence, this approach cannot account for the fact that they may be less flexible in compromising and negotiate more forcefully to defend their position[24]. Indeed, if greater lobbying effort is devoted by concentrated industries, it follows that governments of countries at the top of the scale (i.e. with higher levels of industry concentration) are subject to greater sector specific pressures. Hence, they are more likely to express strong preferences for decisions favourable to that sector than are governments relatively immune to pressures from the concerned sector, being at the bottom of the scale. This is probably the case for decisions generating no or little negative externalities for the domestic economy or for decisions whose negative

[23] This again provides some indication why it is useful, in an aggregate analysis for several policy domains, sectors and specific issues, to provide a priori indices that allow members to be rank-ordered on scales in various ways and to basically form coalitions without restrictions.

[24] These are problems, of course, that also complicate more standard analyses using the spatial theory of voting.

impact remains obscure (due to asymmetric information)[25]. However, when decisions generate large negative spillover effects to the society, as it is the case with most redistributive policies which fail to lead to a Pareto improvement, counter-lobbying is to be expected from the part of injured economic agents, to the extent that they can organise themselves successfully[26]. This suggests that countries at one extreme of the scale (in the case of simple lobbying) or both extremes (in the presence of counter-lobbying) have stronger preferences than centre players. For one-sided issues (i.e. in the absence of counter-lobbying) though, extreme countries with strong preferences have a tendency to impose their views. For dual issues (i.e. with counter-lobbying) however, the role of centre countries may prove critical in tilting the final decision towards on side. This increased bargaining power, coupled with their more diluted preference, can make their defection critical in a coalition building process. Thus, in this latter case, the adapted Banzhaf index adopted in this paper (and to some extent the "inclusiveness index") seems rather useful, as it tends to generate a higher power index for centre players whose defection is not only more critical, but also more likely[27].

Before turning to sector specific issues, a few comments should be added on the general coalition building process as determined by the structure of the economy at large. Several indicators of preference can prove useful. For instance, in the case of the European monetary union, the capacity of member states to satisfy the convergence criteria[28] might have helped understanding their respective position (and thus the ability to form coalitions) on the intergovernmental level vis-à-vis the Euro[29]. Similarly, measures of unemployment and inflation may serve as a first proxy to country attitude towards social policy (with the same caveats applying), whereas income per capita may help identify attitudes towards the EU regional policy and the structural funds.

3.2. International trade

Instead, let us investigate another policy area, international trade. Apart from the importance of the issue, in particular in view of regional integration, two main factors justify the choice of trade policy. Most importantly, the interest group model has first been developed and applied within the context of trade policy (see the extensive political economy literature on trade, also referred to as endogenous trade policy, surveyed by Hillman 1989 and Rodrik 1995). Second, there is a good set of

[25] Some decisions on industry specific technical standards, for instance, would fall into this category.

[26] A standard example is trade policy, where export-oriented sectors and consumers of imported intermediary and final goods are likely to oppose measures protecting import-competing sectors.

[27] In several other instances, however, especially when the exit threat of a centre player is believed not to be credible, it may be helpful to use the Shapley-Shubik index for connected coalitions, as advocated by Berg and Perlinger (1999) and Holler and Widgrén (1999).

[28] The five convergence criteria set in the Maastricht Treaty concerned the ratio of government deficit to gross domestic product (GDP), the ratio of government debt to GDP, the inflation rate, the long-term nominal interest rate, and the exchange rate.

[29] This issue, however, was dealt with in the classical framework of EU intergovernmental negotiations and not as a day-to-day policy decision in which the weighted voting of the Council of the EU applied.

trade data readily available.

In order to determine the attitude of member states towards trade policy, we consider the relative importance of trade with non-EU countries for each member state. The idea behind this is that more liberal countries will trade relatively more than protectionist ones. Our approach differs from previous studies in two respects. First, Kirman and Widgrén (1995), whose analysis provides helpful guidelines for our approach, adopted the level of extra-EU import over total import in a country as an indicator, with the assumption that the higher this ratio, the more liberal is a country. However, this indicator may not be totally robust, as a large extra-EU import ratio may simply trigger stronger demand for protection from domestic producers (see Faini 1995). Besides, country differences in the ratio of extra-EU import may also reflect differences in the "natural" pattern of trade flows between countries rather than differences in their trade policy. While serving as a thorough and good reference, another difference with the analysis provided here is that Kirman and Widgrén (1995), like Widgrén (1995), do not consider "linked" coalitions, but rather distinguish between three groups of member states, divided between protectionist, liberal and indifferent countries[30]. This categorisation, however, allows them to work with probabilistic models of coalition-formation (more specifically, with the partial homogeneity assumption)[31].

In order to extend such earlier studies, we consider the overall level of trade (i.e., total imports and exports) over GDP ratio, a classic indicator of trade openness. To control for price effects (in terms of price changes and exchange rate problems which could affect the ratio values), we take these variables at constant prices (in 1987 US dollars), and the GDP is estimated using the World Bank purchasing power parity index. Finally, in order to control for year-specific shocks, a five-year average from 1991 to 1995 will be used. Openness ranking of member states and respective results for the adapted Banzhaf index and for the "inclusiveness index" are provided in Table 2.

[Table 2 about here]

When taking trade over GDP as an indicator for preferences, we find that Germany, France and the UK are strong players in the framework of the Council of the EU. Similarly, Greece, Sweden, Denmark and Austria are privileged by their position on the scale. Generally, the policy views of the members located in the centre of the scale will rather frequently be taken into account, as figures on the "inclusiveness index" confirm.

Of course, no indicator is exempt to criticisms. To assess the sensitivity of our results, we consider an alternative indicator of trade openness developed by Low, Olarreaga and Suarez (1998), the corrected trade index. The basic idea is to account for the country size effect in trade (i.e., large countries trade relatively less than small

[30] In the latter study following a helpful, yet somewhat arbitrary, classification by Hamilton (1991).
[31] On this assumption, also see Widgrén (1995).

ones) and the wealth effect (i.e., poor countries trade a lot of industrial goods and rich ones trade a lot of services, whereas middle income countries trade relatively less services although their service sector is rather well developed). Results in Table 2 show that the overall ranking order remains roughly similar. Belgium, Ireland and the Netherlands have the highest values for the ratio of trade to GDP and the corrected trade index, suggesting they are more liberal. On the contrary, Portugal, Spain, and to some extent Italy appear to be among the less open economies. However, some striking differences in ranking arise, the most disturbing one concerning Luxembourg. On the basis of the corrected trade index, applying the power index for "connected coalitions", we find France, the UK and Italy to be the strongest players, whereas especially the three Benelux countries appear to be rather powerless.

Finally, an interesting indicator may be not so much the actual trade openness of a country, but rather a country's attitude towards future trade policies. In this case, an index of the speed of trade integration of the EU member states may prove more informative. This index accounts for the fact that initially open economies may experience difficulties in further opening their economies. Table 2 also reports member states' ranking on the rate of trade integration between 1976 and 1995, as estimated by Low *et al.* (1998).

As compared to the regular (normalized) Banzhaf index of power, our estimate is that countries such as Germany, France, the UK and the Netherlands again belong to the ones privileged in the decision-making process. By contrast, Greece, Luxembourg, Portugal and Italy are weaker than their voting weights and general voting power would suggest. Similarly, the "inclusiveness index" demonstrates that Greece and Luxembourg are not frequently represented in winning coalitions. Once winning coalitions form, as the power index for connected coalitions demonstrates, bargaining leverage within the coalition varies among the "centre players" and we expect Germany, France and the UK to be rather forceful players in this area.

The analysis of trade policy shows once more that the estimates of political influence in coalitions are very sensitive to the types of trade indicators adopted. The appropriate choice of trade policy index should ultimately rest on empirical evidence[32]. However, our estimates tend to indicate that the four biggest countries have a relatively predominant power in the determination of trade policy (with some reservations perhaps for Italy).

3.3. The Automobile industry

The automobile industry is one of the most concentrated sectors in Europe. In 1992, while large companies accounted for only 3 percent of manufacturers of motor vehicles and parts, they employed over 86 percent of the workers in this sector (see European Commission 1997). The ability of the automobile industry to shape the EU policy in its sector comes as no surprise in view of the interest group model. Indeed, lobbying by large car manufacturers, at national as well as EU level, is a well-known phenomenon. Large car manufacturers have been able to prevent or slow down both

[32] For instance, the fact that France and Greece systematically rank higher than the UK, hence suggesting that they are more liberal, is particularly disturbing in view of their generally more protectionist stance.

the internal and external liberalisation process. They have succeeded in obtaining some forms of temporary exemptions to the integration of the Single Market. Similarly, they have managed to maintain temporary external protection (mainly at the expense of Japanese and Korean car producers)[33].

The interest group model suggests that, in the policy-making process, countries where manufacturers of motor vehicles and parts are the most important and concentrated must be the strongest defenders of automobile industry interests. Table 3 provides some information on these characteristics. In Table 4, member states are ranked according to two main indicators of the industry structure: the relative size, in terms of employment, of the automobile sector and the industry concentration as measured by the share of workers in this sector employed by large companies.

An obvious indicator for the size of an industry is the share of workers employed in it. This measure indicates the relative size of the industry compared to other domestic industries. An alternative consists in measuring the relative size of a domestic industry compared to the same industry in other countries. This can be done by calculating the ratio of relative share of EU employment in a domestic industry over the overall share of EU employment for the country (see Table 3 for details).

[Tables 3 and 4 about here]

As expected, however, Table 4 shows that these two measures of the relative size of the automobile industry lead to the same ranking of member states. The automobile industry is relatively larger in Sweden, Germany, France and Belgium (with over two percent of the national working force in this sector and a national ratio of EU car employment above one) and relatively insignificant in countries like Denmark, Luxembourg and Greece. The concentration of employment in the automobile sector also reflects a similar (although not identical) ranking among member states.

In terms of voting power, this suggests that the UK will be a rather important player in this domain, as is Italy. Countries with little employment in the automobile industry, such as Luxembourg, Greece and Ireland, will have little voting power when bargaining about decisions in this domain. Interestingly, Germany, a large country expected to face heavy domestic lobbying in this area, may be relatively weaker and less often included in a "winning coalition", as it is harder to lead a coalition of members advocating positions close to its own preferences. In spite of its size, Germany does not really play a critical role in a coalition. Note however that in general countries with a higher relative influence have a relatively significant automobile sector (i.e. they rank third to nineth), a finding that is supported by the figures on the "inclusiveness index".

[33] For an insightful analysis of the political economy of the EU automobile industry, see Holmes and Smith (1995).

4. Conclusions

This article aims to illustrate how the relative "leverage" of EU member states may be assessed when the coalition-formation process among governments is considered to be constrained. More specifically, we are interested in assessing the potential influence of members on the basis of both their relative weight in the voting procedures and their likely preferences as represented, in a spatial framework, on a (uni-dimensional) policy scale[34].

Hence, the primary objective of this paper is to contribute to the further development of the theory of voting power analysis, by linking elements of the spatial analysis of voting with n-person cooperative games. In this framework, we relax, in situations in which we feel this might legitimately be done, the assumption of random or arbitrary coalitions. To do so, we rely on two approaches: a power index for "connected coalitions" and the interest group model. After setting the theoretical basis for the analysis, we investigated the possible outcomes in selected policy areas in an attempt to illustrate how the methodology can be applied to actual policy areas[35].

As data on members' preferences are largely unavailable, and problems related to their origins, stability and the sincerity of their revelation are likely to exist, we adopt an indirect way of assessing this relative influence. Based on data on members' industrial concentration and trade openness, we estimate preferences as we expect them to be voiced by EU governments in related policy domains. Our theoretical foundation for this approach is the political-economic "interest group model", assuming that similar degrees of industrial concentration and similar characteristics in terms of trade relations and openness induce, amplified or mitigated by institutional structures, similar pressures by special interests on domestic politics**.** Rank-ordering EU member states with respect to such characteristics then allows us to derive an ordinal scale on which we expect "connected coalitions" to form – coalitions among members that are adjacent in terms of their policy positions ("ideal points"). Whereas the translation of industry characteristics into preferences may not be one-to-one, we may nonetheless assume that similar structures of industry and trade will lead special interest groups to voice similar requests to their governments in a comparison among EU member states. Hence, preferences of governments as voiced in the bargaining process on the intergovernmental level – whether in the actual Council of the EU or at ambassadorial level – are likely to be similar for countries with similar characteristics in terms of these selected elements of industrial structure and trade.

More specifically, we find that members' location on the scale in terms of trade openness is likely to privilege some members as compared to their "pure" voting (or bargaining) power based on voting weight. In the domain of trade policy, we expect to see France, the UK, and also Germany to be among the strongest players in

[34] Certainly, in some cases, it may be difficult to distinguish between "power" and "luck" in this framework: members located in the centre of a respective scale may be as much "lucky" to be situated there as have "power" to influence overall policy outcomes. Compare Barry (1980) and Holler and Widgrén (1999).

[35] The main purpose of this paper, however, is not to assess the empirical relevance of this approach. To do this, it would be necessary to first test the interest group model for various policy fields in the EU and then verify whether the predictions of the interest group model translate into interest-based coalition formation.

the Council, whereas other members, including Luxembourg and Belgium, are expected to have a rather weak bargaining potential.

In the domain of the automobile industry, we should assume essential car-producers, including Sweden, Germany and France, to be important in the framework of the Council of the EU. Higher intensity of interest, and more salience of the industry in domestic politics due to either a high employment share in this sector or a concentration in large firms, is likely to lead to a more radical stance on the issue. However, when the qualified majority quota needs to be reached, as our results demonstrate, it may be rather easier for countries with more moderate employment shares in the industry (or more moderate shares of large firms in the total) to be included into a "winning coalition" that advocates a specific policy. Accordingly, whereas the UK and Italy can be expected to be rather strong players in this domain, Sweden and Germany might not be quite as successful in obtaining a (qualified) majority to agree with their policy stance.

If resorting to the methodology of the power index for "connected coalitions" as presented here, care will of course need to be applied when designing a respective policy scale believed to capture the rank-ordering on which EU members may join a coalition. Our results may provide some indications for specific policy domains on how such coalitions may build up. If data on actual preferences were available − with all the intricacies linked to assessing preferences in practice − such models might forecast actual policy outcomes with more accuracy. Similarly, in the context of such efforts, it might then be rather useful to see what position other institutions, including the Commission or the European Parliament, would advocate on their "aggregate level" (splitting down the Commission into different Directorate Generals or Commissioners' portfolios, or considering the different Committees or Political Groups in the European Parliament, would of course generate additional challenges to the analysis).

Nonetheless, if trying to indicate how not only voting weights, but also the relative position of EU governments on a respective policy scale may either privilege or disadvantage them in the Council's decision-making process, it may be rather important to study coalition-formation and expected influence in ways as applied in this paper. The possible link between a priori voting power indices and the spatial analysis of voting still has potentials to be further explored.

Table 1a: Industrial structure and employment share (1992), rank-ordering and power indices under the qualified majority rule

	(1) Employment share of large firms (in percent)		Power index for connected coalitions (in percent)	(2) Employment share in energy, extraction and manufacturing (in percent)		Power index for connected coalitions (in percent)	(3) Employment share in construction (in percent)		Power index for connected coalitions (in percent)	(4) Employment share in trade and hotels and catering (in percent)		Power index for connected coalitions (in percent)	(5) Employment share in transport, communication, financial services (in percent)		Power index for connected coalitions (in percent)		"Regular" normalized Banzhaf index of a priori Power
Rank																	
1	B	43.8	0.00	D	42.7	1.39	L	15.4	0.00	GR	46.5	3.39	L	31.3	0	D	11.2
2	FIN	43.4	0.00	P	40.4	2.78	E	14.4	3.39	NL	34.9	3.39	UK	28.0	5.88	F	11.2
3	UK	42.3	11.36	FIN	38.9	0.00	S	12.9	5.08	A	34.7	5.08	F	27.8	11.76	UK	11.2
4	D	40.1	15.91	IRL	38.7	2.78	IRL	12.0	6.78	DK	34.7	5.08	B	27.8	9.8	I	11.2
5	NL	39.1	9.09	A	38.0	6.94	P	11.8	6.78	E	34.2	8.47	NL	27.7	9.8	E	9.2
6	F	36.6	15.91	I	37.3	13.89	A	11.7	8.47	S	33.6	6.78	FIN	26.5	5.88	B	5.9
7	S	34.8	4.55	DK	36.4	4.17	F	11.1	11.86	IRL	33.5	6.78	S	21.7	7.84	NL	5.9
8	A	32.0	4.55	F	33.9	13.89	DK	10.9	6.78	UK	32.6	13.56	GR	21.2	9.8	GR	5.9
9	L	29.0	2.27	B	33.6	9.72	NL	10.3	8.47	P	32.5	6.78	I	20.6	13.73	P	5.9
10	DK	27.5	4.55	S	31.8	8.33	B	10.2	8.47	I	32.1	13.56	D	20.5	13.73	A	4.8
11	P	22.5	9.09	E	31.3	12.5	I	10.0	11.86	B	28.4	6.78	E	20.1	5.88	S	4.8
12	I	21.3	15.91	UK	30.6	12.5	GR	9.6	8.47	L	28.1	1.69	DK	18.0	1.96	DK	3.6
13	IRL	20.7	2.27	NL	27.1	6.94	D	9.4	8.47	D	27.4	10.17	IRL	15.8	0	IRL	3.6
14	E	18.9	4.55	L	25.2	1.39	FIN	8.8	1.69	F	27.2	6.78	A	15.6	1.96	FIN	3.6
15	GR	14.4	0.00	GR	22.7	2.78	UK	8.8	3.39	FIN	25.8	1.69	P	15.3	1.96	L	2.3
EU		33.8	100.01		35.6	100.0		10.4	99.96		30.9	99.98		23.1	99.98		100.3

Source for data: Eurostat (European Commission, *Enterprises in Europe*, Fourth Report, 1997)

(1) Employment share of large companies [i.e., >250 employees], %, 1992
(2) Employment share in energy, extraction and manufacturing industry, %, 1992
(3) Employment share in construction, %, 1992
(4) Employment share in trade and hotels and catering, %, 1992
(5) Employment share in transport, communication, financial services, %, 1992

Table 1b: Industrial structure and employment share (1992), rank-ordering and probability to be a member of a winning coalition under the qualified majority rule

	(1) Employment share of large firms (rank-ordering of members)	Probability of being included in a "winning coalition" (in percent)	(2) Employment share in energy, extraction and manufacturing (rank-ordering of members)	Probability of being included in a "winning coalition" (in percent)	(3) Employment share in construction (rank-ordering of members)	Probability of being included in a "winning coalition" (in percent)	(4) Employment share in trade and hotels and catering (rank-ordering of members)	Probability of being included in a "winning coalition" (in percent)	(5) Employment share in transport, communication, financial services (rank-ordering of members)	Probability of being included in a "winning coalition" (in percent)	"Inclusiveness Index" when coalitions among EU member states are non-connected	
Rank												
1	B	2.31	D	2.44	L	2.17	GR	2.58	L	2.97	D	8.03
2	FIN	4.62	P	4.39	E	4.35	NL	4.12	UK	5.94	F	8.03
3	UK	6.94	FIN	5.85	S	5.98	A	5.67	F	7.92	UK	8.03
4	D	8.09	IRL	7.32	IRL	7.07	DK	6.70	B	8.42	I	8.03
5	NL	8.09	A	7.80	P	7.61	E	7.73	NL	8.42	E	7.45
6	F	8.09	I	8.29	A	8.15	S	8.25	FIN	8.42	B	6.43
7	S	8.09	DK	8.29	F	8.15	IRL	8.25	S	8.42	NL	6.43
8	A	8.09	F	8.29	DK	8.15	UK	8.25	GR	8.42	GR	6.43
9	L	8.09	B	8.29	NL	8.15	P	8.25	I	8.42	P	6.43
10	DK	8.09	S	8.29	B	8.15	I	8.25	D	8.42	A	6.10
11	P	8.09	E	8.29	I	8.15	B	8.25	E	7.43	S	6.10
12	I	8.09	UK	7.80	GR	8.15	L	7.73	DK	6.44	DK	5.74
13	IRL	6.36	NL	6.83	D	7.07	D	7.22	IRL	4.95	IRL	5.74
14	E	4.62	L	4.88	FIN	5.43	F	5.67	A	3.47	FIN	5.74
15	GR	2.31	GR	2.93	UK	3.26	FIN	3.09	P	1.98	L	5.34
EU		99.97		99.98		99.99		100.01		100.04		100.05

Table 2: Trade openness and trade integration, power and inclusiveness indices

	Openness ranking, 1991-95								*Ranking of rates of trade integration between 1976 and 1995*			
	Trade over pppGDP				Corrected trade index				Speed of trade integration			
Rank	Country	Value	Power index for connected coalitions (in percent)	"Inclusiveness index"	Country	Value	Power index for connected coalitions (in percent)	"Inclusiveness index"	Country	Value	Power index for connected coalitions (in percent)	"Inclusiveness index"
1	L	1.98	0.00	1.88	B	2.31	0.00	2.22	GR	1.61	0.00	2.67
2	B	1.64	3.17	3.76	NL	2.24	1.75	4.44	B	1.35	1.37	4.89
3	IRL	1.37	3.17	5.16	IRL	1.92	3.51	6.22	IRL	1.35	1.37	6.22
4	NL	1.32	4.76	6.57	D	1.88	10.53	7.56	NL	1.35	12.33	7.56
5	A	0.97	6.35	7.51	S	1.40	7.02	8.44	E	1.28	9.59	8.44
6	DK	0.97	6.35	7.98	GR	1.40	7.02	8.44	D	1.26	16.44	8.44
7	S	0.96	7.94	8.45	A	1.30	7.02	8.44	S	1.17	6.85	8.44
8	FIN	0.81	6.35	8.45	F	1.17	14.04	8.44	A	1.17	5.48	8.44
9	D	0.76	12.70	8.45	DK	1.14	7.02	8.44	F	1.05	16.44	8.44
10	F	0.56	12.70	8.45	UK	1.12	14.04	8.44	UK	1.01	16.44	8.44
11	GR	0.54	7.94	8.45	I	1.10	14.04	8.44	FIN	1	4.11	8.00
12	UK	0.51	12.70	8.45	FIN	1.08	5.26	7.56	DK	0.99	2.74	7.11
13	I	0.49	9.52	7.51	E	1.08	5.26	6.22	P	0.99	1.37	6.22
14	P	0.45	3.17	5.63	P	0.92	3.51	4.44	I	0.99	4.11	4.44
15	E	0.41	3.17	3.29	L	0.81	0.00	2.22	L	0.75	1.37	2.22
Total EU		13.74	99.99	99.99		20.87	100.02	99.96		17.32	100.01	99.97
Average			6.67	6.67			6.67	6.67			6.67	6.67

Source for data: Low, Olarreaga and Suarez (1998)

Table 3: Manufacture of motor vehicles and of motor vehicle parts and accessories, 1992

	All sectors		Manufacture of motor vehicles and parts				
	(1) Total country employment (Mio)	(2) Share of EU total employment (%)	(3) Employment	(4) Share of total national employment (%)	(5) Share of EU employment (%)	(6) Ratio of employment (5)/(2)	(7) Employment share of large companies [>250] (%)
B	2.95	2.9	57658	2.0	3.0	1.03	89.6
DK	1.41	1.4	5965	0.4	0.3	0.22	29.5
D	24.13	23.9	817424	3.4	42.5	1.78	94.9
GR	1.95	1.9	2766	0.1	0.1	0.07	48.6
E	10.37	10.3	142148	1.4	7.4	0.72	82.5
F	14.40	14.3	338006	2.3	17.6	1.23	87.9
IRL	0.54	0.5					
I	13.49	13.4	222516	1.6	11.6	0.87	79.3
L	0.16	0.2	376	0.2	0.0	0.12	55.3
NL	4.27	4.2	26608	0.6	1.4	0.33	63.2
A	2.16	2.1	25046	1.2	1.3	0.61	78.4
P	2.95	2.9	20317	0.7	1.1	0.36	54.6
FIN	1.15	1.1	7080	0.6	0.4	0.32	52.0
S	2.24	2.2	87508	3.9	4.5	2.05	
UK	18.85	18.7	179723	1.0	9.3	0.50	77.4
EU	101.02	100	1924364	1.9	100	1	86.5

Source for data: Eurostat (European Commission, *Enterprises in Europe*, Fourth Report, 1997)

(1) Number of persons employed in all sectors, Mio, 1992.
(2) Share of EU population, %, 1992.
(3) Employment in the manufacture of motor vehicles and parts, 1992.
(4) Share of total national employment, %, 1992. (4) = (3) / (1)
(5) Share of EU employment in motor vehicle industry, %, 1992.
(6) Ratio of relative share of employment in the motor vehicle industry compared to overall employment in the EU, 1992. (6) = (5) / (2)
(7) Share of employment in the manufacture of motor vehicles and parts in large enterprises (i.e., with over 250 persons), %, 1992.

Table 4: National relative importance of the automobile industry (1992)

Rank	Country	(4) Share of total national employment (in percent) Value	(6) National ratio of EU employment Value	Power index for connected coalitions (in percent)	"Inclusiveness Index"	(7) Employment share of large companies [+250] (in percent) Country	Value	Power index for connected coalitions (in percent)	"Inclusiveness Index"
1	S	3.9	2.05	0.00	3.20	D	94.9	4.17	3.81
2	D	3.4	1.78	8.20	6.39	B	89.6	4.17	6.19
3	F	2.3	1.23	13.11	8.22	F	87.9	12.50	8.10
4	B	2.0	1.03	8.20	8.68	E	82.5	12.50	8.57
5	I	1.6	0.87	14.75	8.68	I	79.3	13.89	8.57
6	E	1.4	0.72	9.84	8.68	A	78.4	8.33	8.57
7	A	1.2	0.61	6.56	8.68	UK	77.4	13.89	8.57
8	UK	1.0	0.50	14.75	8.68	NL	63.2	8.33	8.57
9	P	0.7	0.36	8.20	8.68	L	55.3	4.17	8.10
10	NL	0.6	0.33	4.92	7.76	P	54.6	5.56	7.62
11	FIN	0.6	0.32	3.28	6.85	FIN	52.0	4.17	7.14
12	DK	0.4	0.22	3.28	5.94	GR	48.6	4.17	6.19
13	L	0.2	0.12	1.64	4.57	DK	29.5	1.39	4.76
14	GR	0.1	0.07	1.64	3.20	S	n.a.	1.39	3.33
15	IRL	n.a.	n.a.	1.64	1.83	IRL	n.a.	1.39	1.90
Total	--	--	--	100.01	100.04	--	--	100.02	99.99
Average	--	1.9	1	6.67	6.67	--	86.5	6.67	6.67

Source for data: Eurostat (European Commission, *Enterprises in Europe*, Fourth Report, 1997)

Note: The ranking for (4), the share of total national employment, and (6), the ratio of national over EU employment, is the same.

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