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Duality of Power in the European Parliament

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IES Working Paper: 6/2008



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Duality of Power in the European Parliament

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Abstract:

Increasing number of studies is focusing attention to constitutional analysis of European Union institutions and distribution of intra-institutional and inter-institutional influence in the European Union decision making. Most of the studies are related to distribution of voting power in the EU Council of Ministers as reflecting the influence of member states (or, more precisely, member states governments). Significantly less attention is paid to the analysis of European Parliament (EP). In this paper we address the following question: Taking as decisional units national chapters of European political parties, is there a difference between a priori voting power of national groups in the case of “national” coordination of voting and in the case of “partisan” coordination of voting? By coordination of voting we mean two step process: in the first step there is an internal voting in the groups of units (national or partisan), in the second step there is a voting of aggregated groups (European political parties or national representations) in the EP. In the both cases the voting has an ideological dimension (elementary unit is a party), difference is only in dimension of aggregation. Power indices methodology is used to evaluate voting power of national party groups in the cases of partisan and national coordination of voting behaviour.

Keywords: a priori voting power, European Parliament, European political parties, power indices, Shapley-Shubik power index

JEL: D710, D740.

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1. Introduction

During last two decades we can observe a boom of power indices literature related to constitutional analysis of European Union institutions and distribution of intra-institutional and inter-institutional influence in the European Union decision making.

While most of the studies focused on models of institutional system of the European Union (EU) emphasizes analysis of voting power in the EU Council of Ministers as reflecting the influence of member states (or, more precisely, member states governments)¹, significantly less attention is paid to the power analysis of European Parliament (EP). Historically first paper on model analysis of the EU institutions (Holler and Kellermann, 1997) was focused on national distribution of voting power in the European Parliament (even before the first direct election of the EP in 1979), but there were not many followers of this direction of model oriented EP analysis. In Johnston (1982) the “fairness” of regional representation in parliamentary bodies was investigated with empirical illustrations based on national representation in the European Parliament. Hosli (1997) analyzed new situation in EP after 1994 reallocation of seats of national representations and introduced into power considerations voting strength of European political parties. Nurmi (1997a) formulated model of political representation in the European Parliament (how voters of different political parties are represented from the point of view of influence of national chapters of European political parties that follows from ideological voting). Hix (2002) investigated two political dimensions

¹ Distribution of power in the EU Council of Ministers and European and the recent development associated with the 1995 and 2004 enlargement of the EU has been analyzed in Brams and Affuso (1985), Widgrén (1994, 1995), Steunenberg, Smidchen and Koboldt (1999) Tsebelis (1994), Nurmi (2000), Nurmi, Meskanen and Pajala (2001), Bindseil and Hantke (1997), Laruelle (1998), Felsenthal and Machover (2004), Holubiec and Mercik (1996), König and Brauningner (2001), Turnovec (1996, 2001, 2002), Plechanovovová (2004), Baldwin and Widgrén (2004), Słomczyński and Życzkowski (2006) and others.

(national and ideological) in EP voting and Noury (2002) provided empirical data about voting in the EP to establish the proportion of “nationally” and “ideologically” motivated voting. Mercik, Turnovec, and Mazurkiewicz (2004) demonstrate the fact that for some countries it would be more beneficial to coordinate voting of its members of EP on national level rather than on ideological level. Hix, Noury and Roland (2006) provide the most extensive insight into the development of political process in the EP, of history of developing European political parties, conflicts and coalition formations.

In this paper we extend Nurmi (1997a) and Mercik, Turnovec and Mazurkiewicz (2004) analysis and formulate the following problem: taking as decisional units national groups of European political parties, is there a difference between a priori voting power of national groups in the case of “national” coordination of voting and in the case of “partisan” coordination of voting? By coordination of voting we mean two step process: in the first step there is an internal voting in the groups of units (national or partisan), in the second step there is a voting of aggregated groups (European political parties or national representations). In both cases the voting has an ideological dimension (elementary unit is a national party group), difference is only in dimension of aggregation.

To evaluate voting power (or influence) of actors in EP decision making we use the power indices methodology. Two most widely used power indices were proposed by Penrose and Banzhaf (1946, 1965) and Shapley and Shubik (1954). There exist also some other well defined power indices, such as Holler-Packel index (1983), Johnston index (1978), and Deegan-Packel index (1979). The most comprehensive survey and analysis of power indices methodology see in Felsenthal and Machover (1998, 2004). We selected Shapley-Shubik power measure for its appealing properties (local and global monotonic property, equality of absolute and relative power, see Turnovec 1996, 2004), but any other power measure mentioned above can be used as well.

In the second section of this paper we shortly recapitulate committee model and a priori voting power methodology in setting suitable for hierarchical and more-dimensional extension of the model. Section three presents two level committee model of power decomposition: in a “grand” committee consisting of subcommittees it is assumed that into the first step each subcommittee looks for joint position in internal subcommittee voting and than (depending on result of internal voting) the subcommittees vote unanimously in the “grand” committee decision making. A short description of the structure of recent EP is outlined in section four. Section five applies the two-level committee model with two dimensions of decision making hierarchy (ideological and national) in EP and defines measures of influence of national party

groups, European political parties and national representations in each of two dimensions. Using Berg and Holler (1986) concept of randomized decision making rules and some empirically established proportion of ideological and nationally driven voting acts we can define (as a synthetic measure) expected power of national party groups, European political parties and national representations reflecting both dimension of voting. Empirical results of power analysis for ideological and national dimension of EP decision making are provided in section six. In section seven conclusions and further research possibilities in this field are discussed.

2. Power Indices Methodology

Let $N = \{1, 2, \dots, n\}$ be the set of agents (individuals, parties) and ω_i ($i = 1, \dots, n$) be the (real, non-negative) weight of the i -th agent and τ be the total sum of weights of all agents. Let γ be a real number such that $0 < \gamma < \tau$ (minimal sum of weights necessary to approve a proposal). The $(n+1)$ -tuple $[g, \omega] = [g, w_1, w_2, \dots, w_n]$ such that

$$\sum_{i=1}^n w_i = t, w_i \geq 0, 0 \leq g \leq t$$

we call a committee (or a weighted voting body) of the size $n = \text{card } N$ with quota γ , total weight τ and allocation of weights. $\omega = (w_1, w_2, \dots, w_n)$. Assume that each agent i uses in voting all his resources given by his weight ω_i undivided, i.e. he casts all his votes either as “yes” votes, or as “no” votes. Any non-empty subset of agents $S \subseteq N$ we shall call a voting configuration. Given an allocation w and a quota γ , we shall say that $S \subseteq N$ is a winning voting configuration, if $\sum_{i \in S} w_i \geq g$ and a losing voting configuration, if $\sum_{i \in S} w_i < g$. Let

$$T = \left[(g, \omega) \in R_{n+1} : \sum_{i=1}^n w_i = t, w_i \geq 0, 0 \leq g \leq t \right]$$

be the space of all committees of the size n , total weight τ and quota γ .

A *power index* is a vector valued function $\Pi: T \rightarrow R_n^+$ that maps the space T of all committees of the size n into non-negative quadrant of R_n . A power index represents for each of the committee agents’ a “reasonable expectation” that she will be “decisive” in the sense that her vote (YES or NO) will determine the final outcome of voting. To define a particular power index one has to clarify what this “reasonable expectation” means, to identify some qualitative property (decisiveness) whose presence or absence in voting process can be established and quantified

(Nurmi, 1997b). Generally there are two such properties, related to committee agents' positions in voting, that are being used as a starting point for quantification of an a priori voting power: swing position and pivotal position of a committee agent. We shall use pivotal positions based power measure introduced by Shapley and Shubik (1954), so called SS-power.

Let the numbers 1, 2, ..., n be fixed names of committee agents. Let (i_1, i_2, \dots, i_n) be a permutation of those numbers, agents of the committee, and let agent k is in position r in this permutation, i.e. $k = i_r$. We shall say that an agent k of the committee is in a pivotal situation (has a pivot) with respect to a permutation (i_1, i_2, \dots, i_n) , if

$$\sum_{j=1}^r w_{i_j} \geq g \quad \text{and} \quad \sum_{j=1}^r w_{i_j} - w_{i_r} < g$$

Let us assume that a strict ordering of agents in a given permutation expresses an intensity of their support (preference) for a particular issue in the sense that, if an agent i_s precedes in this permutation an agent i_t , then agent i_s support for the particular proposal to be decided is stronger than support by the agent i_t . One can assume that the group supporting the proposal will be formed in the order of positions of agents in the given permutation. If it is so, then the agent k will be in situation when the group composed from preceding agents in the given permutation still does not have enough of votes to pass the proposal, and a group of agents place behind him in the permutation has not enough of votes to block the proposal. The group that will manage his support will win. Agent in a pivotal situation has a decisive influence on the final outcome. In an abstract setting, assuming many voting acts and all possible preference orderings equally likely, under the full veil of ignorance about other aspects of individual agents' preferences, it makes sense to evaluate an a priori voting power of each committee member as a probability of being in pivotal situation. This probability is measured by the SS-power index:

$$p_i^{SS}(g, \omega) = \frac{P_i}{n!}$$

where p_i is the number of pivotal positions of the committee agent i and $n!$ is the number of permutations of all committee agents (number of different strict orderings).

3. Two level committee model of power decomposition

Let $\mathbf{p} = (\pi_1, \pi_2, \dots, \pi_n)$ be the vector of Shapley-Shubik power indices of agents in the committee $[g, \omega] = [g, w_1, w_2, \dots, w_n]$. Then π_i is a probability that agent $i \in N$ will be in a pivotal situation.

Each agent i can be understood as a group G_i with cardinality ω_i (number of individual members of the committee belonging to i). Let us assume that group G_i consists of several subgroups. Let $G_{ij} \subset G_i$ be a subgroup j of the group G_i and $\omega_{ij} = \text{card}(G_{ij})$, number of members of G_i belonging to G_{ij} . Assuming that each group (agent) i is partitioned into $m(i)$ subgroups G_{ij} , we can consider the following two step procedure of voting: first each agent G_i looks for joint position in a subcommittee $[\gamma_i; \omega_{i1}, \omega_{i2}, \dots, \omega_{im(i)}]$, where γ_i is the quota for voting in subcommittee i (e.g. the simple majority). There is a vote inside the group first (micro-game) and then the group is voting together in the committee on the basis of results of internal voting (macro-game).

If $\mathbf{s}_i = (s_{i1}, s_{i2}, \dots, s_{im(i)})$ is the internal power distribution in subcommittee $[\gamma_i; \omega_{i1}, \omega_{i2}, \dots, \omega_{im(i)}]$ where s_{ij} be an internal power of subgroup G_{ij} in micro-game, and $\mathbf{p}_i = (\pi_{i1}, \pi_{i2}, \dots, \pi_{im(i)})$ be the power distribution of members of group G_i in committee $[\mathbf{g}, \boldsymbol{\omega}] = [\mathbf{g}, w_1, w_2, \dots, w_n]$ then the voting power π_{ij} of the subgroup G_{ij} in macro-game is $\pi_{ij} = \pi_i s_{ij}$ expressing the probability of the subgroup G_{ij} being pivotal in the committee decision making. Using SS-power concepts it is easy to show that

$$\sum_{j=1}^{m(i)} \pi_{ij} = \pi_i$$

so we obtained decomposition of the power of agent i among the subgroups G_{ij} .

There exist different more-level committees. For example the upper houses of national parliaments have twofold affiliation of its individual members: they represent citizens of the region they were elected in and on the other side they are affiliated to some political party. The same is true for European Parliament: each individual member is affiliated to some European party faction, and at the same time he represents interests of citizens of its own country. Formally we can consider two models of such a committee: one model with agents aggregated into the party factions, the second with regional (country) aggregation. Then it makes sense to consider the distribution of power in each dimension: partisan coordination and national coordination.

4. European Parliament

The European Parliament, designed to represent the citizens of European Union member states, is the only directly elected institution of the European Union. European Parliament (EP) has a dual structure: members of EP represent their own countries (and in

certain extent they are aware of national interests) and at the same time they belong to national political parties (and in this sense they represents ideological preferences of the groups of citizens). Internally, members of European Parliament are clustered in European political parties, forming clubs (factions) in the EP.

In the sixth legislative term (2004-2009) there are 732 members of the EP elected by citizens of 25 member states.² They are divided into seven political groups (European political parties):

PPE-DE - Group of the European People's Party (Christian Democrats) and European Democrats,

PSE - Socialist Group in the European Parliament,

ALDE - Group of the Alliance of Liberals and Democrats for Europe,

Verts/ALE - Group of the Greens/European Free Alliance,

GUE/NGL – Con-federal Group of the European United Left - Nordic Green Left,

IND/DEM - Independence/Democracy Group,

UEN - Union for Europe of the Nations Group,

NI - Not-attached Members.

European Parliament acts on the basis of simple majority rule, and in some cases absolute majority is required. Composition of the European Parliament after 2004 election is provided in Table 1.

² We are reflecting situation after 2004 election, before 2007 extension.

Table 1

Members and political factions of European Parliament of the sixth term, situation as at 30 November 2004

Country	PPE DE	PSE	ALDE	Verts ALE	GUE NGL	IND DEM	UEN	NI	Total
Austria	6	7		2				3	18
Belgium	6	7	6	2				3	24
Cyprus	3		1		2				6
Czech R.	14	2			6	1		1	24
Denmark	1	5	4	1	1	1	1		14
Estonia	1	3	2						6
Finland	4	3	5	1	1				14
France	17	31	11	6	3	3		7	78
Germany	49	23	7	13	7				99
Greece	11	8			4	1			24
Hungary	13	9	2						24
Ireland	5	1	1		1	1	4		13
Italy	24	16	12	2	7	4	9	4	78
Latvia	3		1	1			4		9
Lithuania	2	2	7				2		13
Luxemburg	3	1	1	1					6
Malta	2	3							5
Netherlands	7	7	5	4	2	2			27
Poland	19	8	4			10	7	6	54
Portugal	9	12			3				24
Slovakia	8	3						3	14
Slovenia	4	1	2						7
Spain	24	24	2	3	1				54
Sweden	5	5	3	1	2	3			19
United Kingdom	28	19	12	5	1	10		3	78
Total	268	200	88	42	41	36	27	30	732

Individual members of the EP represent citizens of member states and number of seats is distributed roughly proportionally to the size of population among the member states. The election to the EP has an ideological dimension: using proportional electoral systems citizens are casting votes for national political parties.

EP is institutionally structured on ideological principle, the individual members work in factions of the European political parties. While empirical evidence indicates, that almost in all cases members of the national party groups are voting together, Noury (2004) demonstrated, using empirical data about voting acts in EP of the fifth term, that ideological dimension in EP voting prevails (in almost 80% of cases EP members voted according European party affiliation), but there were still more than 20% of voting driven by national

dimension (voting by national affiliation). Consequently, to measure influence in the EP basic decision making unit is a national party groups and it makes sense to measure not only voting power of European political parties and/or voting power of national representations, but also the voting power of national party groups, both in ideologically driven voting and nationally driven voting.

5. Modeling distribution of power in the European Parliament

To evaluate distribution of power of national party groups in European Parliament as basic decision making units we use the Shapley-Shubik concept of voting power and model of two-level committee from section 3. To reflect the double dimensionality in voting we use two dimensions of committee structure: the European party factions decomposed into national groups, and the national representations decomposed into the party groups. Basic unit remains the same in both cases: national party group. Then we obtain two schemes of decision making coordination: first based on European party factions and national party groups, second based on national representations and national party groups.

First (ideological) dimension leads to committee model A with European parties as agents voting together, $[\gamma, p_1, p_2, \dots, p_n]$, the second (national) dimension leads to committee model B with national representations as agents voting together, $[\gamma, n_1, n_2, \dots, n_m]$, where γ is the quota (the same for both models), p_i is the weight (number of seats) of European party i , n_k is the weight (number of seats) of member state k (n is the number of European parties, m is the number of member states).

Committee A generates n subcommittees A_j such that $[\gamma_j, p_{1j}, p_{2j}, \dots, p_{mj}]$, where p_{ij} denotes number of members of party group j from country i , γ_j being a specific quota for subcommittee A_j . Each of these subcommittees consists of at most m national subgroups of the European political party j , where in each subcommittee the members of each party from the same member state k are voting together. We shall refer to the corresponding two-level model

$$\left\{ \begin{array}{c} A \\ A_1, A_2, \dots, A_n \end{array} \right\}$$

as the ideologically structured committee system $\{A/A_j\}$.

Committee B generates m subcommittees B_k such that $[\delta_k, p_{k1}, p_{k2}, \dots, p_{kn}]$, where p_{ki} denotes number of members of party group i from country k , δ_k being a specific quota for

subcommittee B_k . Each of these subcommittees consists of at most n party subgroups of the national representation k , where in each subcommittee the members of from the same party j are voting together. We shall refer to the corresponding two-level model

$$\left\{ \begin{array}{c} B \\ B_1, B_2, \dots, B_m \end{array} \right\}$$

as the nationally structured committee system $\{B/B_k\}$.

Let us denote by

α_j voting power of the European party j in the committee A (voting by ideological dimension), probability that party j will be pivotal in ideologically coordinated voting,

β_k voting power of the nation k in the committee B (voting by national dimension), probability that nation k will be pivotal in nationally coordinated voting,

α_{kj} voting power of the national segment k of party j in subcommittee A_j , probability that national segment k of party j will be pivotal in internal party voting,

β_{kj} voting power of the national segment k of party j in subcommittee B_k , probability that party segment j of representation of country k will be pivotal in internal national voting,

π_{kj} voting power of the national segment k of party j in the committee $\{A/A_j\}$, probability that national segment k of party j will be pivotal in the grand committee voting based on ideological coordination,

φ_{kj} voting power of the national segment k of party j in the committee $\{B/B_k\}$, probability that party segment j of national representation k will be pivotal in the grand committee voting based on national coordination.

Using standard algorithms we can find SS-power indices α_j in committee A and α_{kj} in committees A_j (probabilities of being pivotal in corresponding committees) and then calculate

$$p_{kj} = a_{kj} a_j .$$

as conditional probability of two independent random events – pivotal position of j in grand committee A and pivotal position of k in subcommittee A_j . From probabilistic interpretation and properties of SS-power indices

$$\sum_{j=1}^n a_j = 1, \quad a_j \geq 0 \quad \text{and} \quad \sum_{k=1}^m a_{kj} = 1, \quad a_{kj} \geq 0$$

for all $j = 1, 2, \dots, n$ and $k = 1, 2, \dots, m$ it follows that

$$\sum_{k=1}^m p_{kj} = a_j \sum_{k=1}^m a_{kj} = a_j$$

The sum of voting powers of national groups of European political party j in ideological voting is equal to the voting power of the European political party. The total power is decomposed among the national units of the party. In a more intuitive way: the national group k of political party j is in a pivotal position in ideologically structured committee system $\{A/A_j\}$ if and only if it is in pivotal position in subcommittee A_j and the party j is in a pivotal position in committee A .

Less trivial is the following result: The country k is in a pivotal position in ideological coordination of voting if some party group from k is in pivotal position. Pivotal positions of national party groups of the same country in ideologically voting are mutually exclusive random events, hence the probability that some party group from state k is in a pivotal position is

$$\sum_{j=1}^n p_{kj} = \sum_{j=1}^n a_j a_{kj} = q_k$$

(sum of power indices of all party groups from member state k). Then θ_k can be interpreted as measure of country k influence in ideologically coordinated voting. From properties of SS-power it follows that

$$\sum_{k=1}^m q_k = \sum_{k=1}^m \sum_{j=1}^n a_j a_{kj} = \sum_{j=1}^n a_j \sum_{k=1}^m a_{kj} = \sum_{j=1}^n a_j = 1$$

There is no other direct way how to evaluate θ_k .

In the same way we can find β_k in committee B and β_{kj} in committees B_k and then calculate

$$j_{kj} = b_{kj} b_k$$

as conditional probability of two independent random events - pivotal position of k in grand committee B and pivotal position of j in subcommittee B_k). Measure of party j influence in nationally coordinated voting is

$$\sum_{k=1}^m j_{kj} = \sum_{k=1}^m b_k b_{kj} = J_j$$

(sum of power indices of party group j from all member states).

Berg and Holler (1986) introduced concept of randomized decision making rules: let D be a set of decision making rules and Q a probability measure over D , then appropriate power measure in family of committees $[d \in D; \omega_1, \omega_2, \dots, \omega_n]$ is expected value

$$\bar{p}_i = \int_{d \in D} p_i(d) dQ$$

where $\pi_i(d)$ stands for power index in the committee [$d \in D$; $\omega_1, \omega_2, \dots, \omega_n$]. For discrete $D = \{d_1, d_2, \dots, d_k\}$ with probabilities p_1, p_2, \dots, p_k the expected value is

$$\bar{p}_i = \sum_{t=1}^k p_t p_t$$

In our case we have two matrices of power indices of national party groups, Π and Φ , corresponding to two decision making rules (partisan and national coordination). Assuming mix of national and party coordination with probability λ of party coordination of voting and $1-\lambda$ probability of national coordination of voting, we obtain expected voting power of national party groups in our model as

$$\Sigma(\lambda) = \lambda\Pi + (1-\lambda)\Phi$$

where $\Sigma(\lambda) = (\sigma_{ij}(\lambda))$, $\sigma_{ij}(\lambda)$ stands for expected a priori voting power of party group j from region i .

6. Illustrative example

Let us consider hypothetical parliament consisting of representatives of three regions A, B, and C decomposed into three super-regional parties L, M, R (altogether 6 national party groups). Distribution of seats is provided in Table 2.

Table 2
Regions/parties

	L	M	R	total
		seats		
A	7	10	3	20
B	15	15	0	30
C	3	22	25	50
total	25	47	28	100

Influence of super-regional parties

Committee [51; 25, 47, 28]

Voting power (1/3, 1/3, 1/3)

Influence of regional representations

Committee [51; 20, 30, 50]

Voting power (1/6, 1/6, 2/3)

Influence of regional party groups in ideologically coordinated voting?

Party group L

Part L committee [13; 7, 15, 3]

Voting power of regional party groups in party L committee (0, 1, 0)

Total power of L in the parliament ideological voting $1/3$ is decomposed among the regional party groups (0, $1/3$, 0)

Party group M

Party M committee [24; 10, 15, 22]

Voting power of regional party groups in party M committee ($1/3$, $1/3$, $1/3$)

Total power of M in the parliament ideological voting $1/3$ is decomposed among the regional party groups ($1/9$, $1/9$, $1/9$)

Party group R

Party R committee [15; 3, 0, 25]

Voting power of regional party groups in party R committee (0, 0, 1)

Voting power of R in the parliament ideological voting $1/3$ is decomposed among the regional party groups (0, 0, $1/3$)

Evaluation of voting power of regional party groups in ideological voting is provided in Table 3

Table 3

Regions/parties

	L	M	R	total
	voting power			
A	0	$1/9$	0	$1/9$
B	$3/9$	$1/9$	0	$4/9$
C	0	$1/9$	$3/9$	$4/9$
total	$3/9$	$3/9$	$3/9$	1

Table 3 provides decomposition of power among national party groups in ideologically coordinated voting (last row) and at the same time decomposition of power (national influence) among national representations in ideologically coordinated voting (last column).

Influence of regional party groups in regionally coordinated voting?

Region A

Region A committee [11; 7, 10, 3]

Voting power of regional party groups in region A committee ($1/6$, $4/6$, $1/6$)

Total power of region A in the parliament regionally coordinated voting $1/6$ is decomposed among the regional party groups ($1/36$, $4/36$, $1/36$)

Region B

Region B committee [16; 15, 15, 0]

Voting power of regional party groups in region A committee (1/2, 1/2, 0)

Total power of region B in the parliament regionally coordinated voting 1/6 is decomposed among the regional party groups (3/36, 3/36, 0)

Region C

Region C committee [26; 3, 22, 25]

Voting power of regional party groups in region C committee (1/6, 2/60, 3/6)

Voting power of region C in the parliament regionally coordinated voting 4/6 is decomposed among the regional party groups (4/36, 8/36, 12/36)

Evaluation of voting power of regional party groups in regionally coordinated voting is provided in Table 4

Table 4
Regions/parties

	L	M	R	total
	voting power			
A	1/36	4/36	1/36	6/36
B	3/36	3/36	0	6/36
C	4/36	8/36	12/36	24/36
total	8/36	15/36	13/36	1

Table 4 provides decomposition of power among national party groups in regionally coordinated voting (last column) and at the same time decomposition of power (ideological influence) among super/regional parties in nationally coordinated voting (last row).

Let us assume that 3/4 of voting acts are ideologically coordinated and 1/4 of voting acts are regionally coordinated. Then, from the following matrix equation

$$\frac{3}{4} \begin{pmatrix} 0 & \frac{4}{36} & 0 \\ \frac{12}{36} & \frac{4}{36} & 0 \\ 0 & \frac{4}{36} & \frac{12}{36} \end{pmatrix} + \frac{1}{4} \begin{pmatrix} \frac{1}{36} & \frac{4}{36} & \frac{1}{36} \\ \frac{3}{36} & \frac{3}{36} & 0 \\ \frac{4}{36} & \frac{8}{36} & \frac{12}{36} \end{pmatrix} = \begin{pmatrix} \frac{1}{144} & \frac{16}{144} & \frac{1}{144} \\ \frac{39}{144} & \frac{15}{144} & 0 \\ \frac{4}{144} & \frac{20}{144} & \frac{48}{144} \end{pmatrix}$$

we obtain the expected voting power of regional party groups, super-regional parties and regional representations (see Table 5).

Table 5
Regions/parties

	L	M	R	total
	expected voting power			
A	1/144	16/144	1/144	18/144
B	39/144	15/144	0	54/144
C	4/144	20/144	48/144	72/144
total	44/144	51/144	49/144	1

7. Empirical results

In Table 6 we provide internal distribution of Shapley-Shubik power of national party groups in national representations (in our notations β_{kj}). Table 7 presents distribution of SS power among national party groups, national representations and European parties in simple majority voting based on national coordination (in our notations ϕ_{kj} , β_k and ξ_j). Table 8 shows internal distribution of Shapley-Shubik power of national party groups in European parties (in our notations α_{kj}). Distribution of SS power among national party groups' and national representations in simple majority voting based on ideological coordination is presented in Table 9 (in our notations π_{kj} , α_j and θ_k). Table 10 compares power of national representations in voting based on partisan and national coordination and Table 11 compares power of European political parties on partisan and national coordination. All results are multiplied by 100 (in percentage terms), data are rounded. Using Hix, Noury and Roland (2007) empirical evaluation of proportion of ideologically and national driven voting coordination with $\lambda = 0,8$ and $1-\lambda = 0,2$, we obtain expected power of national party groups, European political parties and national representations (Table 12).

Table 6

Internal distribution of Shapley-Shubik power of national party groups in national representations

Country	Internal SS-power of national party groups in national representations (in %)								
	PPE-DE	PSE	ALDE	Verts/ALE	GUE/NGL	IND/DEM	UEN	NI	Total
Austria	25	41,67	0	8,33	0	0	0	25	100
Belgium	28,33	36,68	28,33	3,33	0	0	0	3,33	100
Cyprus	66,67	0	16,66	0	16,66	0	0	0	100
Czech R.	100	0	0	0	0	0	0	0	100
Denmark	7,14	35,72	21,44	7,14	7,14	7,14	7,14	7,14	100
Estonia	16,67	66,67	16,67	0	0	0	0	0	100
Finland	28,33	28,33	36,67	3,33	3,33	0	0	0	100
France	13,81	50,48	13,81	7,14	3,81	3,81	0	7,14	100
Germany	60	10	10	10	10	0	0	0	100
Greece	41,67	25	0	0	25	8,33	0	0	100
Hungary	100	0	0	0	0	0	0	0	100
Ireland	40	10	10	0	10	10	20	0	100
Italy	38,46	21,07	14,4	1,07	7,02	4,4	9,18	4,4	100
Latvia	16,67	0	16,67	16,67	0	0	50	0	100
Lithuania	0	0	100	0	0	0	0	0	100
Luxemburg	75	8,33	8,33	8,33	0	0	0	0	100
Malta	0	100	0	0	0	0	0	0	100
Netherlands	30	30	20	6,67	6,67	6,67	0	0	100
Poland	43,37	13,33	8,33	0	0	18,33	8,33	8,33	100
Portugal	16,67	66,67	0	0	16,67	0	0	0	100
Slovakia	100	0	0	0	0	0	0	0	100
Slovenia	100	0	0	0	0	0	0	0	100
Spain	31,67	31,67	6,67	23,34	6,67	0	0	0	100
Sweden	30	30	13,33	0	13,33	13,33	0	0	100
United Kingdom	44,28	19,29	19,29	2,62	0,95	10,95	0	2,62	100

Table 7 Distribution of SS power of national party groups in simple majority voting based on national coordination
 SS power of national party groups in voting based on national coordination

Country	PPE-DE	PSE	ALD E	Verts/AL E	GUE/NG L	IND/DE M	UE N	NI	SS power of national representations based on national coordination
Austria	0,59	0,98	0,00	0,19	0,00	0,00	0,00	0,59	2,34
Belgium	0,89	1,15	0,89	0,10	0,00	0,00	0,00	0,10	3,14
Cyprus	0,51	0,00	0,13	0,00	0,13	0,00	0,00	0,00	0,77
Czech R.	3,14	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,14
Denmark	0,13	0,65	0,39	0,13	0,13	0,13	0,13	0,13	1,81
Estonia	0,13	0,51	0,13	0,00	0,00	0,00	0,00	0,00	0,77
Finland	0,51	0,51	0,66	0,06	0,06	0,00	0,00	0,00	1,81
France	1,52	5,56	1,52	0,79	0,42	0,42	0,00	0,79	11,02
Germany	8,72	1,45	1,45	1,45	1,45	0,00	0,00	0,00	14,53
Greece	1,31	0,79	0,00	0,00	0,79	0,26	0,00	0,00	3,14
Hungary	3,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,01
Ireland	0,67	0,17	0,17	0,00	0,17	0,17	0,34	0,00	1,68
Italy	4,24	2,32	1,59	0,12	0,77	0,48	1,01	0,48	11,02
Latvia	0,19	0,00	0,19	0,19	0,00	0,00	0,58	0,00	1,16
Lithuania	0,00	0,00	1,68	0,00	0,00	0,00	0,00	0,00	1,68
Luxemburg	0,58	0,06	0,06	0,06	0,00	0,00	0,00	0,00	0,77
Malta	0,00	0,64	0,00	0,00	0,00	0,00	0,00	0,00	0,64
Netherlands	1,06	1,06	0,71	0,24	0,24	0,24	0,00	0,00	3,54
Poland	3,18	0,98	0,61	0,00	0,00	1,35	0,61	0,61	7,35
Portugal	0,52	2,09	0,00	0,00	0,52	0,00	0,00	0,00	3,14
Slovakia	1,81	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,81
Slovenia	0,90	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,90
Spain	2,33	2,33	0,49	1,71	0,49	0,00	0,00	0,00	7,35
Sweden	0,74	0,74	0,33	0,00	0,33	0,33	0,00	0,00	2,47
United Kingdom	4,88	2,13	2,13	0,29	0,10	1,21	0,00	0,29	11,02
SS power of parties based on national coordination	41,57	24,12	13,13	5,34	5,60	4,58	2,67	2,99	100

Table 8

Internal distribution of Shapley-Shubik power of national party groups in European political parties

Internal SS power of national party groups in European political parties								
Country	PPE-DE	PSE	ALDE	Verts/ALE	GUE/NGL	IND/DEM	UEN	NI
Austria	2,09	3,17	0	4,15	0	0	0	9,76
Belgium	2,09	3,17	6,74	4,15	0	0	0	9,76
Cyprus	1,04	0	1,07	0	4,53	0	0	0
Czech R.	5,02	0,89	0	0	15,14	2,54	0	1,43
Denmark	0,34	2,24	4,39	2,01	2,25	2,54	6,67	0
Estonia	0,34	1,33	2,16	0	0	0	0	0
Finland	1,39	1,33	5,55	2,01	2,25	0	0	0
France	6,16	15,97	13,18	12,8	6,98	8,17	0	25,24
Germany	20,81	11,27	7,96	39,57	18,27	0	0	0
Greece	3,9	8,58	0	0	9,54	2,54	0	0
Hungary	4,65	4,11	1,07	0	0	0	0	0
Ireland	1,74	0,44	1,07	0	2,25	2,54	13,33	0
Italy	8,94	7,55	14,6	4,15	18,27	12,06	36,67	11,9
Latvia	1,04	0	1,07	2,01	0	0	13,33	0
Lithuania	0,69	0,89	7,96	0	0	0	6,67	0
Luxemburg	1,04	0,44	1,07	2,01	0	0	0	0
Malta	0,69	1,33	0	0	0	0	0	0
Netherlands	2,45	3,17	5,55	8,26	4,53	4,68	0	0
Poland	6,94	3,63	4,39	0	0	28,37	23,33	22,38
Portugal	3,17	5,55	0	0	6,98	0	0	0
Slovakia	2,81	1,33	0	0	0	0	0	9,76
Slovenia	1,39	0,44	2,16	0	0	0	0	0
Spain	8,94	11,82	2,16	6,18	2,25	0	0	0
Sweden	1,74	2,24	3,25	2,01	4,53	8,17	0	0
United Kingdom	10,6	9,1	14,6	10,68	2,25	28,37	0	9,76
Total	100	100	100	100	100	100	100	100

Table 9

Distribution of SS power of national party groups in simple majority voting based on party coordination

Country	SS power of national party groups in voting based on partisan coordination								SS power of national representations
	PPE-DE	PSE	ALDE	Verts/ALE	GUE/NGL	IND/DEM	UEN	NI	based on partisan coordination
Austria	0,85	0,60	0,00	0,27	0,00	0,00	0,00	0,43	2,14
Belgium	0,85	0,60	0,96	0,27	0,00	0,00	0,00	0,43	3,10
Cyprus	0,42	0,00	0,15	0,00	0,26	0,00	0,00	0,00	0,84
Czech R.	2,04	0,17	0,00	0,00	0,88	0,13	0,00	0,06	3,28
Denmark	0,14	0,42	0,62	0,13	0,13	0,13	0,29	0,00	1,87
Estonia	0,14	0,25	0,31	0,00	0,00	0,00	0,00	0,00	0,70
Finland	0,56	0,25	0,79	0,13	0,13	0,00	0,00	0,00	1,87
France	2,50	3,02	1,87	0,84	0,41	0,42	0,00	1,11	10,17
Germany	8,45	2,13	1,13	2,59	1,07	0,00	0,00	0,00	15,37
Greece	1,58	1,62	0,00	0,00	0,56	0,13	0,00	0,00	3,89
Hungary	1,89	0,78	0,15	0,00	0,00	0,00	0,00	0,00	2,82
Ireland	0,71	0,08	0,15	0,00	0,13	0,13	0,59	0,00	1,79
Italy	3,63	1,43	2,07	0,27	1,07	0,62	1,61	0,52	11,22
Latvia	0,42	0,00	0,15	0,13	0,00	0,00	0,59	0,00	1,29
Lithuania	0,28	0,17	1,13	0,00	0,00	0,00	0,29	0,00	1,87
Luxemburg	0,42	0,08	0,15	0,13	0,00	0,00	0,00	0,00	0,79
Malta	0,28	0,25	0,00	0,00	0,00	0,00	0,00	0,00	0,53
Netherlands	0,99	0,60	0,79	0,54	0,26	0,24	0,00	0,00	3,43
Poland	2,82	0,69	0,62	0,00	0,00	1,45	1,03	0,98	7,59
Portugal	1,29	1,05	0,00	0,00	0,41	0,00	0,00	0,00	2,74
Slovakia	1,14	0,25	0,00	0,00	0,00	0,00	0,00	0,43	1,82
Slovenia	0,56	0,08	0,31	0,00	0,00	0,00	0,00	0,00	0,95
Spain	3,63	2,24	0,31	0,40	0,13	0,00	0,00	0,00	6,71
Sweden	0,71	0,42	0,46	0,13	0,26	0,42	0,00	0,00	2,41
United Kingdom	4,30	1,72	2,07	0,70	0,13	1,45	0,00	0,43	10,81
SS power of parties Based on partisan Coordination	40,60	18,93	14,17	6,55	5,83	5,12	4,40	4,40	100

Table 10

Power of national representations in voting based on partisan and national coordination

Country	SS power of national representations based on party coordination	SS power of national representations based on national coordination
Austria	2,14	2,34
Belgium	3,10	3,14
Cyprus	0,84	0,77
Czech R.	3,28	3,14
Denmark	1,87	1,81
Estonia	0,70	0,77
Finland	1,87	1,81
France	10,17	11,02
Germany	15,37	14,53
Greece	3,89	3,14
Hungary	2,82	3,01
Ireland	1,79	1,68
Italy	11,22	11,02
Latvia	1,29	1,16
Lithuania	1,87	1,68
Luxemburg	0,79	0,77
Malta	0,53	0,64
Netherlands	3,43	3,54
Poland	7,59	7,35
Portugal	2,74	3,14
Slovakia	1,82	1,81
Slovenia	0,95	0,9
Spain	6,71	7,35
Sweden	2,41	2,47
United Kingdom	10,81	11,02
	100,00	100,00

Table 11

Power of European political parties in voting based on partisan and national coordination

Party	SS power of European parties based on party coordination	SS power of European parties based on national coordination
PPE-DE	40,6	41,57
PSE	18,93	24,12
ALDE	14,17	13,13
Verts/ALE	6,55	5,34
GUE/NGL	5,83	5,6
IND/DEM	5,12	4,58
UEN	4,4	2,67
NI	4,4	2,99
	100	100

Table 12

Expected power of national party groups, European political parties and national representations based on mix of national and party coordination with $\lambda = 0,8$

Country	Expected SS power of national party groups in voting based on mix of national and party coordination								Expected SS power of national representations based on mix of national and party coordination
	PPE-DE	PSE	ALDE	Verts/ALE	GUE/NGL	IND/DEM	UEN	NI	
Austria	0,80	0,68	0,00	0,26	0,00	0,00	0,00	0,46	2,19
Belgium	0,86	0,71	0,94	0,24	0,00	0,00	0,00	0,36	3,11
Cyprus	0,44	0,00	0,15	0,00	0,24	0,00	0,00	0,00	0,82
Czech R.	2,26	0,13	0,00	0,00	0,71	0,10	0,00	0,05	3,25
Denmark	0,14	0,47	0,58	0,13	0,13	0,13	0,26	0,03	1,86
Estonia	0,14	0,30	0,27	0,00	0,00	0,00	0,00	0,00	0,71
Finland	0,55	0,30	0,76	0,12	0,12	0,00	0,00	0,00	1,85
France	2,31	3,53	1,80	0,83	0,41	0,42	0,00	1,05	10,34
Germany	8,50	2,00	1,19	2,36	1,14	0,00	0,00	0,00	15,20
Greece	1,53	1,46	0,00	0,00	0,60	0,16	0,00	0,00	3,74
Hungary	2,11	0,62	0,12	0,00	0,00	0,00	0,00	0,00	2,86
Ireland	0,70	0,10	0,15	0,00	0,14	0,14	0,54	0,00	1,77
Italy	3,75	1,61	1,97	0,24	1,01	0,59	1,49	0,52	11,18
Latvia	0,38	0,00	0,16	0,14	0,00	0,00	0,59	0,00	1,27
Lithuania	0,22	0,13	1,24	0,00	0,00	0,00	0,23	0,00	1,83
Luxemburg	0,45	0,08	0,13	0,12	0,00	0,00	0,00	0,00	0,79
Malta	0,22	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,55
Netherlands	1,01	0,69	0,77	0,48	0,26	0,24	0,00	0,00	3,45
Poland	2,89	0,75	0,62	0,00	0,00	1,43	0,94	0,91	7,54
Portugal	1,13	1,26	0,00	0,00	0,43	0,00	0,00	0,00	2,82
Slovakia	1,27	0,20	0,00	0,00	0,00	0,00	0,00	0,34	1,82
Slovenia	0,63	0,07	0,24	0,00	0,00	0,00	0,00	0,00	0,94
Spain	3,37	2,26	0,34	0,67	0,20	0,00	0,00	0,00	6,84
Sweden	0,71	0,49	0,43	0,11	0,28	0,40	0,00	0,00	2,42
United Kingdom	4,42	1,80	2,08	0,62	0,13	1,40	0,00	0,40	10,85
Expected SS power of European parties based on mix of national and party coordination	40,80	19,97	13,96	6,31	5,79	5,01	4,05	4,12	100,00

8. Concluding remarks

We tried to show that it is possible to evaluate not only the influence of European political parties as entities in ideologically driven voting and of national representations as entities in nationally driven voting, as it is usually done in analytical papers (Holler and Kellermann (1977), Hosli (1997), Nurmi (1997a)) but also the influence of national chapters of European political parties both in ideological and national voting and national influence in ideological voting, as well as the European political parties influence in national voting. Moreover, using mix of partisan coordination and national coordination (based on empirical ex post data about voting and assuming the same behavior in future), we can evaluate expected power of national party groups, European political parties and national representations reflecting both ideological and national dimension.

We demonstrated that different dimensions of voting (ideological, national) lead to different levels of influence of the same national party group, European political party and national representation. For example, by our model the national chapter of the two Czech Social Democrats has zero influence in national coordination of voting, but measurable non-zero influence in partisan coordination within parliamentary faction of PSE. The national influence of the Czech Republic in ideologically coordinated voting is greater than in nationally coordinated voting. While the influence of PSE in ideologically coordinated voting is 18.93%, in nationally coordinated voting it increases to 24.12%. Disaggregated structural effects, abandoned by most of standard analyses, are at least as important as aggregated effects.

The findings of our model analysis open the problem of strategic considerations, such as coalition formation, that can go across the existing structure, e.g. coalition of a country representation with some European political party, or preferring national coordination of different party groups of the same country to ideological coordination (this problem was opened with respect to Poland in Mercik, Turnovec, and Mazurkiewicz, 2004). There is a broad area for extensions of presented model.

Used methodology of power indices has its critics. What exactly power indices are measuring is controversial, see e.g. arguments of Garrett and Tsebelis (1999) about ignoring preferences, and response of Holler and Widgrén (1999), but they are of general interest to political science because they may measure players' ability to get what they want. Admittedly significant share of decisions under the EU decision making procedures are taken without recourse to a formal vote. But it may well be the case that the outcome of negotiation is

conditioned by the possibility that a vote could be taken, and than a priori evaluation of voting power matters. Moreover, analyses of institutional design of decision making could benefit from power indices methodology (Holler and Owen 2001, Lane and Berg 1999). Continuing research and deeper understanding of power indices methodology reflect an actual demand for amendment of traditional legal and political analysis of institutional problems by quantitative approaches and arguments.

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