EU Decision-making and the Allocation of Responsibility

Manfred J. Holler*

First version: February 3, 2011

Revised: May 10, 2011

Second Revision: March 2012

Prepared for the

Research Handbook on the Economics of European Union Law.

To be published by Edward Elgar, Cheltenham

Abstract: The underlying hypothesis of this paper is that the allocation of responsibility will improve decision making just like the assignment of property rights improves the allocation of goods. Similar problems exist in the case of collective decision making as in the provision of public goods. The paper contains some key results of applying the voting power approach to European Parliament, the Council of Ministers, and codecision making involving both institutions. The close relationship between freedom of choice and voting power is elaborated using formal models to represent both concepts. The focus will be on the Public Good Index of power. With the help of a similar model, the close relationship between power and causality can be demonstrated. This is shown by focusing on the NESS concept of causality and applying it to responsibility. A discussion of the various problems embedded in the power-responsibility hypothesis within the context of EU decision making concludes the paper.

Keywords: EU decision-making, collective choice, political responsibility, causation, voting power

* Institute of SocioEconomics, University of Hamburg, Germany, and Public Choice Research Centre, Turku, Finland, Mailing Address: IAW, Von-Melle-Park 5, D-20146 Hamburg, Fax: +49 40 428 38 6329. holler@econ.uni-hamburg.de.

1. On political responsibility

When on March 25th, 1957, the Treaty of Rome was signed creating the European Economic Community (EEC) of *The Six*, the legislative and executive power was installed in the Council of Ministers – the "Council" in what follows. The voting weights were 4 votes each for the larger countries France, Italy, and West Germany, 2 votes each for Belgium and the Netherlands, and 1 vote for Luxembourg. Given the differences in size of the various countries, irrespective of whether measured by population or total GDP, it seemed that Luxembourg was highly overrepresented. However, a qualified majority rule of 12 votes was prescribed and, given this quota, Luxembourg had no say in cases that were submitted to a formal vote. For the given vote distribution w = (4, 4, 4, 2, 2, 1) and the decision rule d = 12, its a priori voting power was zero.

Can we conclude that the citizens of Luxembourg were not responsible for what happened in the EEC? Perhaps not, because in practical terms decisions by the Council relied on a full consensus, and the unanimity rule assigns to Luxembourg the same amount of voting power as it assigns to France, Italy or West Germany. However, could Luxembourg afford to say no if the five other EEC members said yes? Hardly![1] Does this imply that the government and the citizens of Luxembourg were not responsible for what happened in the EEC? Who is responsible for EU decision-making: The Council, the Commission, the European Parliament (EP), the voters who selected the members of the EP or the voters who selected the members of their national governments, directly or via a parliament, the members of the national parliaments and their party peers who decide on government coalitions, the national governments that are represented in the Council, or the politicians, voters and bureaucrats who, in the past, designed the rules and defined the objects of today's decision-making in the EU? What follows if we can answer this question and allocate responsibility to particular institutions and their members? What is responsibility?

The model underlying the following analysis starts with a simple relationship between actions (A) and outcomes (O). In our context, actions A are the result of collective decision-

[1] The abstention of France could bring the working of the Council to a halt. In 1965, due to disagreements between Charles de Gaulle and the Commission's agriculture proposals, France boycotted all meetings of the Council bringing work to a halt until the dispute was resolved the following year by the so-called Luxembourg compromise.

making and outcomes O can be public, merit, or private goods - however, our focus will be on public goods. We identify A with decision-making, a perhaps heroic assumption, given bureaucratic impediments, on the one hand, and the sometimes overly optimistic view on feasibility, on the other. The inputs in decision-making are power (P), i.e. the potential to act, and freedom of choice (F), i.e., the set of alternatives that is available to choose from. Responsibility is embedded in the evaluation (E) of O and the possibility to sanction (S), honor or punish, A and therefore the choice and decision-making that resulted in A. Thus, E and S represent responsibility in our model. (The diagram in the appendix illustrates this model.)

This model and its analysis is motivated by the expectation (or hope) that the allocation of responsibility to individual decision makers will improve choices. This necessitates to clarify the causation that links actions A to outcomes O and also to relate causality to individual decision makers. The latter is solved by linking decision-making to power P and the freedom of choice F, both serve as a proxy of free will, which completes the responsibility model in the case of individual decision-making. The hypothesis underlying this paper is that under a huge pile of provisos we can specify the causal impact of an individual decision maker in a collective decision process by P and thus measure his or her responsibility by P and E. The expectation is that the allocation of responsibility will improve decision-making just as the assignment of property rights can improve the allocation of goods. However, quite similar problems exist in the case of collective decision-making as in the provision of public goods.

The discussion and conceptualization of these problems with reference to EU decision-making is the core of this paper. Section 3 presents some key results of applying the voting power approach to the European Parliament, the Council of Ministers, and codecision-making involving both institutions. In section 4, the close relationship between freedom of choice and voting power is elaborated using formal models to represent both concepts. The focus will be on the Public Good Index of power. With the help of a similar model the close relationship between power and causality can be demonstrated. This is shown, with a focus on the NESS concept of causality, in section 5. These sections offer material that should be of interest also from a methodological point of view. Section 6 will integrate these building blocks and relate them to reponsibility. The next section, i.e., section 2, contains an overview of the various problems embedded in the power-responsibility hypothesis with focus on EU decision-making and a further illustration of the responsibility model presented in this paper. This section can be read as an extended introduction or as a summary note.

In the sequel the reader will repeatedly find references to power measures, more specifically to the Banzhaf index, the Shapley-Shubik index and the Public Good Index (PGI). This is not the occasion to discuss these measures in detail, but a short introduction could be of help to those readers who have had as yet no experience with these measures. All three are based on the concept of a swing (or critical) player, i.e., a player that can turn a winning coalition into a losing one and a losing coalition into a winning one. In its normalized form, the Banzhaf index of player i, β_i, is equal to the number of coalitions that have i as swing player divided by the total number of swing positions in the (voting) game, summed over all players (voters). The PGI differs from the Banzhaf index inasmuch as only minimum winning coalitions (MWCs) are considered. S is a MWC if S\{i} is a losing one, for all $i \in S$, i.e., all players of a MWC have a swing position. The PGI of player i, labelled h_i, counts in how many MWCs i is a member and divides this sum by the sum of all swing positions the players have in the all MWCs of the game.

The Shapley-Shubik index is slightly more complicated as it takes the orderings of players in a coalition into consideration. The swing player metamorphoses into a pivot that turns a losing coalition into a winning one, taking the sequence of coalition members into account. The index value for player Φ_i counts the number of pivot positions of i in the voting game under consideration and divides this number by the number of all permutations that can be formed out of the n players of the game, i.e., n!.

Below are some simple examples that illustrate the Banzhaf index and the PGI and their applications. Applications of the Shapley-Shubik index are also discussed. For those readers who want to learn more about these measures a substantial amount of literature is available that deals with power measures. Felsenthal and Machover (1998) is definitively the most substantial text in this area. However, in what follows we will not presuppose an intimate familiarity with these measures.

2. Responsibility, causation and power

Definitions of responsibility often include a moral component referring to duties, guilt, blameworthiness, or even shame. This is especially the case when it comes to collective responsibility.[2] So far the EU is hardly an institution that arouses moral sentiments despite its decision-making on immigration, environmental standards, and security policy, areas in which moral norms seem to be highly relevant. In general, however, questions of efficiency are

[2] See the contributions published in May and Hoffman (1991).

brought forward when it comes to EU decision-making, either defined as straightforward economic efficiency and international competitiveness or combined with the more sophisticated problem of balancing the preferences of the citizens of its member states.

The latter is an issue of preference aggregation and will be only briefly discussed in this paper. The responsibility notion of this paper focuses on an evaluation of decision-making and its outcome. It implies that sanctions or, more generally, accountability will be demanded if the evaluation indicates poor performance. If there is a causal relationship between decision and outcome, then the assignment of responsibility seems to be straightforward and sanctioning only an issue of power. If there is a power to sanction, then performance can be expected to improve or to be even optimal (in some sense). This is the case of liability and tort law. Both assume causal relationships. However, EU decisions are collective choices. The choices may still be evaluated by their outcomes. However, the allocation of responsibility to individual decision makers and the assignment of responsibility and accountability (e.g. sanctions) is not obvious as there is no straightforward causality that links the outcome of collective decision-making to the individual decision maker. It is not clear how responsibility can improve the decision-making process without solving these problems.

A first approach to an appropriate solution suggests allocating responsibility in accordance with the power of the individual decision entity (see Holler 2007). In the case of the Council, such an entity is the national government that represents a particular member state. Below we will discuss several studies that measure the power of the national representation in the Council. The results, the power distributions in the Council, could serve as a first approach to allocating contributions to the EU budget or CO_2 emission rights within the Union.

The agents who select these governments, i.e., voters, are secondary decision makers. Their impact on the outcome of the Council decisions is much more difficult to evaluate and so far only very stylized designs have been studied, e.g., the Penrose square root rule, which is supposed to guarantee the equal a priori voting power of every EU citizen in the decision-making of the Council. One of the problems with the Penrose square root rule is that it does not guarantee that citizens have equal power when it comes to selecting their national governments and thus may not ensure the representation of their preferences in the Council. The British first-past-the-post system does not even guarantee that a clear majority of votes will lead to a majority of seats in the Westminster Parliament. On the other hand, proportional representation often necessitates coalition formation and a coalitional compromise in policy

making, which is also the case in EU decisions. Voters who voted for party A, and against the competing party B, often are frustrated by finding A and B in the same government coalition after the election. In such cases it is rather difficult to trace the link between the voters' preferences and the political outcome.

In general, on the EU level, the power structure is even more complex than on the national level, as the EP and the Commission also have a say in decision-making, and EP members seem to be cross-pressured by national and ideological interests, the latter deriving from their party affiliations. In what follows I will consider this relationship in a very stylized way without going into institutional and legal details that underlie the structure of this relationship. Tsakatika (2008) identifies three institutional requirements for political responsibility: accountability, openness and identifiability. He concludes that in the EU there is a "responsibility deficit" across all three dimensions but especially concerning accountability and identifiability. The latter, he argues, is a result of the complexity of power relations in EU decision-making, which hinders the identification of the agent responsible for a given political outcome. Interestingly, this conclusion relates power and responsibility – two concepts that are not always seen in close relationship with each other. Thus, it seems to be an adequate point of departure to study the power structure of this organization. In what follows, some tools will discussed and illustrated which should help to create a legal framework such that political or economic responsibility works.

In a democratic system, political responsibility functions to legitimate rulings through voting and to sanction poor performance by voting for an alternative. This however can only work if the legal system allows for political competition. Elections (and voting) are the standard tools to implement political competition. However, countervailing power, the control of one decision-making institution by another and the need for a bargaining solution, is another mechanism that implements competition and allows for political responsibility. This is about checks and balances. In a democratic society this mechanism involves representation and, again, voting as a means of selection but also of sanctioning. Liability derives from legal responsibility and accountability presumes a straightforward causal relation. Both do not directly apply to EU decision-making as it concerns the legislative institution itself and involves collective choices.

EU policy, also due to its historical background, has a strong impact on the economic performance and the structuring of the private economic sector. With reference to EU standardization politics, I will argue below that the EU tends to shift duties and solutions to the private sector when political responsibility becomes a burden. Political responsibility is

traded with economic responsibility. The idea of economic responsibility by and large coincides with the invisible hand: economically inefficient projects get punished by deficit and perhaps bankruptcy, while efficient projects are profitable, successful and will multiply as long as there is demand. The market mechanism takes over responsibility. But where are the sanctions on the designers of the market if market performance is poor? As noted by Adam Smith, self interest and the invisible hand only "frequently" promote the interest of the society (Smith 1981 [1776/77]: 456),

In Goerke and Holler (1998),[3] we argued that the New Approach to European Standardization (NAES), laid out in the Commission's *Green Paper* of October 1990, was a means of the EU authority to get rid of the responsibility of European standardization, a project that looked unprofitable from a political point of view. NAES stipulates that, in general, standards will no longer be decided upon by the Commission in conjunction with the Council. Instead, the Commission is meant to establish standards (a) with the help of European standardization bodies, (b) via providing direct or indirect incentives to companies which should apply standards and should contribute to the financing of the standardization process, and (c) with the support of the national standardization bodies. The mutual recognition (MR) of national regulations on product specifications and of decisions of the European Court of Justice (ECJ) concerning the goods market can be regarded as an implication of NAES.

It could be argued that by renouncing the *Old Approach* that relied on detailed harmonization, the Commission has shed its influence on standardization in Europe to a large degree and has handed over its responsibilities to fairly independent bodies such as the CEN (Comité Européen de Normalisation), CENELEC (Comité Européen de Normalisation Electrotechnique) and ETSI (European Telecommunications Standards Institute).[4] The introduction of MR is a further step in this direction. In Goerke and Holler (1998), taking a public choice perspective, we asked why the Commission should have engineered this deprivation of formal power in European standardization? Why does the Commission rely on the interaction of nominally independent agents in organizing European standardization when it seems a relevant hypothesis to assume that these agents act, at least predominantly, in their own interest or in the interest of those whom they are funded by? Is MR an adequate instrument to bring the internal goods market closer to efficiency despite the self-interested

[3] See also Holler (2011) for a recent discussion.
[4] With respect to EU members, the distribution of voting weights in CEN and CENELEC is identical with the Council, however the decision rule requires acceptance by 71%, *abstentions not being counted.*

agents in the standardization game? Does regulatory competition work the same as competition on goods markets is supposed to work? Does it enhance efficiency?

Or is NAES just an instrument of the EU authorities, the Commission and the Council, to dispose of the responsibility for European standardization - and also to avoid explicit conflicts due to vested interests? If so, then the introduction of MR can be viewed as a means of obfuscation in this policy arena. Government politicians could be at a disadvantage in popularity and lose votes on the national level if they are held responsible for the standardization policy of the Commission and the Council, especially if the resulting harmonization is felt to be tremendously inflexible and biased in favor of some (interest-) groups in the population. The Old Approach, based on detailed (technical) standardization, was not very popular, sometimes even subject to satire and jokes, and it was rather costly. In comparison, it appears that MR obfuscation policy works properly. On the one hand, it seems to give back some regulatory power to national institutions, on the other, it seems not only to favor the market of regulations but also to support competition between the regulators and even in the internal goods market. But these effects are far from obvious. For instance, in a recent publication, Kerber and van den Bergh (2008) argued that MR leads to a number of inconsistencies: Instead of preserving decentralized regulatory powers and supporting regulatory competition, MR is primarily a path to convergence and rather rigid harmonization. On the other hand, Pelkmans (2011: 22 of ms) concludes: "Mutual recognition is a great invention of the EU." Regulatory MR, "has been very successful over time…The combination of an even more effective approach to existing barriers and an intrusive and targeted pre-emption policy for future ones has effectively spared the single goods market from destructive erosion." In Pelkmans (2007: 699), he observes that MR "is rightly applauded as an ingenious innovation by economists, lawyers and political scientists alike." But Pelkmans also talks of disillusions. He points out that

> "in actual practice, when shipments arrive at a border or in harbours, civil servants or inspectors will typically focus on the detailed specifics in their *national* laws, presumably that is even their routine instruction or impulse" (Pelkmans 2011: 8 of ms).

This procedure may create substantial transaction costs and a high degree of uncertainty.

The relationship of responsibility and obfuscation needs further discussion, also with respect to EU decision-making.[5] However, to some extent, legal and political responsibilities can be substituted by economic responsibility if market participants act accordingly. Glazer et

[5] For the public choice approach to obfuscation, see Magee et al. (1989), Magee (1997) and the various contributions in Breton et al. (2007).

al. (2010) and Kanniainen and Pietarila (2006) present models that demonstrate that oligopolies take environmental protection, sound personnel policy, or avoidance of child labor into consideration if some consumers are willing to pay a higher price for "good products" - and other consumers imitate them. Of course, often there are problems of asymmetric information that undermine the willingness to pay for higher quality. Moreover, the functioning of such mechanisms is rather constrained when goods are public and decisions are made by collectivities: EU authorities should not rely on moral persuasion if they are looking for an efficient policy outcome.

3. Voting power in EU decision-making

There are numerous studies that analyze the power distribution in the Council. This of course is partly due to changes in the vote distribution in the course of the EU enlargement, but also because the Council was and still is the most important decision body in the EU. Moreover, EU legislative decisions have become more and more important over time, covering a growing domain of legislative policy within the realm defined by its member states. Power studies of potential vote distributions and alternative decision rules were presented as arguments in the theoretical and political discussion shaping the Council. The power analysis of the Council also served as an illustration and test of the applied measure. Below we will discuss some examples.

The Commission constitutes the EU executive body. Over the years it has gained the status and form of an EU government. One of its important functions is to introduce proposals into the EU legislative process. As such it may serve as gatekeeper, and this is how it is modelled in the power analysis.[6]

The decision rule of the EP is simple majority voting, while rather sophisticated qualified majority rules have been implemented for the Council over the years. This has consequences not only for the decision-making of the individual institutions but also for the public debate of the decision rules and seat distributions, as well as the power relations of the EP and the Council when both are involved in exercise legislative functions on the EU level. The latter case is discussed in the context of codecision. First, however, we will briefly look into the power relations of the EP and the Commission considered separately.

3.1 The European Parliament

[6] See, e.g., Steunenberg (2001) and the further elaboration of this model in Holler and Napel (2007).

Over recent years, with the extension of the application of codecision, the analysis of the EP in the EU legislative process has gained importance. However, there are still relatively few studies that analyze the power distribution in the EP.[7] The problem is that the EP members have a national and ideological (i.e. party) affiliation and it depends on the issue under consderation whether the one or the other dimension becomes prominent. With reference to the national dimension, an earlier study by Holler and Kellermann (1977) analyzed the effect of a change of the vote distribution that preceded the first direct election to the EP in spring 1978. The application of the Shapley-Shubik index showed that there were no changes in the a priori voting power although the shares of representatives of the various member countries changed. The direct election promised that the EP would have during the next three decades a more substantial impact than it then had.

Because of the direct election, however, it seems that the ideological affiliation of the EP members and their voters has become stronger and stronger. In a more recent study of the EP, Nurmi et al. (2007) tried to answer the question whether it makes sense for a supporter of a smaller party group to vote for his or her first preference or to cast a strategic vote in favor of one of the bigger party groups. An application of the Banzhaf index shows that it does not disadvantage a voter who prefers a smaller party to follow his or her preferences and vote for it or its candidates. Here it is assumed that party groups are the prime movers in the EP and both the representatives and the voters are interested in ideological positions and the policies that derive from these positions.

The enlargement of the EU necessitates an apportionment of EP voting rights to the newcomers. The standard procedure takes into account the size of the population and tries to guarantee the representation of the major political parties of each country.[8] This covers the national and ideological dimension identified above. Bertini et al. (2005) propose to restructure the distribution of EP seats according to not only population sizes but also economic performance as measured by GDP. They suggest a formula that is based on the Banzhaf index and thus incorporates the potential to form a winning coalition, i.e., a priori voting power. Applying this to Europe of the 27 they show that, with the exception of Italy, all countries have their maximum power value if they either are represented in accordance to population or, alternatively, by GDP. The authors do not give a definitive method for

[7] A recent collection of papers, edited by Cichocki and Zyczkowski (2010), contains several contributions on the power allocation in the European Parliament. The focus of this volume is on a "system of equal influence of the citizens in the EU" which is evident from the title of the contribution delivered by the editors.

[8] Today the EP has 736 members. There are 96 members elected by German voters. The voters of Cyprus, Estonia, Luxembourg and Malta are represented by 6 members each.

allocating seats. Their intention was to build up scenarios to understand which EU country would have advantages if we take into account only GDP, only population, or a linear combination of the two. Taking into account GDP only, the analysis shows that Germany should have 24.35% of the seats, France 16.38%, Italy 13.42%, and so on. This percentage for Italy will decrease if a higher weight is given to the population. It will fall to 12.00% given that only population is taken into consideration. The situation for Poland is quite different: there will be 1.80% of seats to it if the apportionment is based on GDP and 8.04% if it is based on population.

However, seat shares are a poor proxy for a prior voting power. Applying the Banzhaf index, Bertini et al. (2005) show that the maximum power for Italy is 12.09%. It was not obtained in accordance with the maximum number of seats (13.42%), but through a linear combination $S = 0.8P + 0.2G$ where P and G represent "population" and "GDP," respectively. This linear combination should be Italy's preferred method for assigning seats among EU member countries. However, in this case Italy would have only 12.28% of the seats. For the corresponding voting game its Banzhaf index shows a maximum. (Note that all other EU member states prefer a different apportionment rule than Italy.)

This result indicates that having more seats does not always mean having more power. Here the nonmonotonicity is due to the multi-dimensionality of the reference space for the seat apportionment. Individual voters also face the multi-dimensionality of the EP, but in general they are not informed about individual decisions of the EP and the decisions of their representatives. (This holds even for students of political sciences.) Elections to the EP are often used as by-elections sanctioning the performance of the political parties on the national level. Voters

> "do not reward parties for good performance, or punish them for bad performance. Instead, they mainly serve as vehicles for voters to express their satisfaction or frustration with the parties in their national parliament" (Kaniovski and Mueller 2011: 62).

Thus the political responsibility mechanism does not work for the EP and its members. However, the stronger the involvement of the EP in EU decision-making and the more important EU decision-making is for the political performance on the national level, the more sophisticated the selection of candidates should be that the political parties offer for the EP. So far EP membership seems to mainly function as a traineeship for more influential positions on the national level, or as a reward to deserving party activists.

3.2 The Council of Ministers

The recent history of the shaping of the Council is highlighted by the Nice Treaty of 2001 and the Brussels agreement of 2004 - the latter was designed as part of the Treaty establishing a constitution for Europe. The discussion was about the proposed seat distributions, on the one hand, and the decision rules, on the other. In accordance with the Treaty of Nice each EU member state is assigned a voting weight which to some degree reflects its population. With the sum of the weights of all 27 member states being 345, the Council adopts a piece of legislation if

(a) the sum of the weights of the member states voting in favor is at least 255 (which is approximately a quota of 73.9%);

(b) a simple majority of member states (i.e. at least 14) vote in favor;

(c) the member states voting in favor represent at least 62% of the overall population of the European Union.

The distribution of weights shows, to pick out some prominent features, an equal distribution of 29 votes to the four larger EU member states Germany, France, the UK, and Italy and 4 votes for each of the member states at the opposite end of the scale: Latvia, Slovenia, Estonia, Cyprus and Luxembourg. Malta with a weight of 3 and population of about 400.000 concludes the scale. Note that Germany, with a population of about 82.5 million, and Italy, with a population of 57.7 million, have identical voting weights. The voting weights are monotonic in population size, but obviously this monotonicity is "very" weak.

For a proposal to pass, all three of these conditions must be satisfied. However, a careful analysis shows that condition (a) is the most significant one. In fact, Felsenthal and Machover (2001) demonstrate that the probability of forming a coalition which meets condition (a) but fails to meet one of the other two is extremely low. Therefore, the "triple majority rule" implied by the Nice Treaty boils down to a single rule. Condition (b) was meant to balance the rather unbalanced representation of the German population, implied by the equal seat share with France, Italy and the UK, but has in general no effect on the Council's decisions.

Given the shortcomings of the voting rule of the Treaty of Nice a revision did not come as a surprise.[9] According to the Brussels agreement of 2004, the Constitutional Treaty, the Council takes its decisions if two criteria are simultaneously satisfied:

(a) at least 55% of EU member states vote in favor;

[9] Illuminating historical details about the decision-making that led to the Treaty of Nice and the Constitutional Treaty of 2004 are described in Baldwin and Widgrén (2004). Obviously, the authors had some inside knowledge.

(b) these member states comprise at least 65% of the overall population of the EU.

A major defect of the Nice voting rule seems to be the high probability that no decisions will be taken and the status quo prevails, i.e., in the low decision-making efficiency as measured by the Coleman power of a collectivity to act. This measure, also called passage probability, represents the probability that the Council would approve a randomly selected issue, where random means "that no EU member knows its stance in advance and each member is equally likely to vote for or against it" (Baldwin and Widgrén 2004: 45). It is specified by the proportion of winning coalitions assuming that all coalitions are equally likely. For the Treaty of Nice rule this measure is 2.1% only, while for the Constitutional Treaty it is 12.9%. However, Baldwin and Widgrén (2004) demonstrate that with no substantial change in the voting power of the member state, the Treaty of Nice system can be revised so that its low decision-making efficiency increases significantly. Thus, the difference in effectiveness does not necessarily speak for the Constitutional Treaty rule. But perhaps fairness does.

Condition (b) of the Constitutional Treaty implies that the voting weights applied are directly proportional to the population of the individual member states. At a glance this looks like an acceptable rule, representing the "one man, one vote" principle. However, it caused an outcry in those countries that seem to suffer by the redistribution of a priori voting power implied in the substitution of the "triple majority rule" of the Treaty of Nice by the "double majority rule" of the Constitutional Treaty – also referring to a violation of the "one man, one vote" principle. For instance, Slomczynki and Zyczkowski (2007a, b) point out that the larger and the smaller countries will gain power should the double majority rule of the Constitutional treaty prevail, while the medium-sized countries, especially Poland and Spain, will be the losers in comparison to the voting power implications of the Treaty of Nice. (But obviously the Council's voting system of the Treaty of Nice was considered defective.)

Both the Treaty of Nice and the Constitutional Treaty imply voting rules that are based on a compromise between the two principles of equality of member states and equality of citizens. The double majority rule emphasizes these principles. Large states gain from the direct link to population, while small countries would derive disproportionate power from the increase in the number of states needed to support a proposal. The combined effect reduces the a priori voting power of the medium-sized countries. More specifically, Germany will gain by far the most voting power under the Constitutional Treaty rule, giving it 37 percent more clout than the UK, while both countries have equal voting power in accordance to rule (a) of the Treaty of Nice. Moreover, the Constitutional Treaty rule will make France the junior

partner in the traditional Franco-German alliance which may lead to severe tensions in this relationship.

Obviously, there are substantial differences between the two schemes discussed, and their application to EU decision-making might have substantial and unwarranted consequences. Moreover, there are conflicts of interests made obvious by the analysis of voting power. In order to lessen these conflicts, Slomczynki and Zyczkowski (2007a, b) propose an allocation of seats and power that they call the "Jagiellonian compromise," named after their home university at Krakow. The core of this compromise is the square root rule, suggested by Penrose (1946). This rule is meant to guarantee that each citizen of each member state has the same power to influence EU decision-making.[10] Applied to the two-tier voting problem of the Council (i.e., voting in the member states at the lower level and in the Council at the upper level), it implies choosing the weights that are proportional to the square root of the population. What remains to be done is to find a quota (i.e. decision rule) such that the voting power of each member state equals its voting weight.

For smaller voting bodies the latter generally cannot be achieved when applying one quota only[11], however, the EU has a sufficiently large number of members so that this equality can be duly approximated. Slomczynki and Zyczkowski (2007b) give an "optimal quota" of 61.6% for the EU of 27 member states. Interestingly, the optimal quota decreases with the size of the voting body.[12]

A further expansion of EU membership (e.g., the admission of Turkey) does not comprise a challenge to the square root rule. The adjusted seat distribution will take care of (the square root of) the additional population share, by redistributing seats or by adding additional seats to the Council, and the quota will be revised so that the a priori power is as equal as possible to the seat distribution. This is why Slomczynki and Zyczkowski (2007a,b) suggest not fixing the quota in a new constitutional contract but only prescribing the procedure, i.e.

(a) That the voting weights attributed to each member state are proportional to the square root of the population.

(b) That a decision is taken if the sum of the weights of the members that vote yes exceeds the quota $q = (1+1/\sqrt{M})/2$, where M represents the number of member states.

[10] Of course, in all practical terms, this probability is zero. Therefore, the norm of equal power cannot be justified on the basis of potential influence. However, fairness could be a better explanation: individual agents might be powerless, but they do not envy each other.

[11] See Berg and Holler (1986) and Holler (1985).

[12] This is immediate from the approximation of the optimal quote q given in Slomczynki and Zyczkowski (2007a). For a voting body of M voters it is: $q = (1+1/\sqrt{M})/2$. For the EU of 25 member states the optimal quote was 62%. (See Slomczynki and Zyczkowski (2007b). Compare Slomczynki and Zyczkowski (2006).)

The choice of the optimal quota guarantees that the Council's decision-making efficiency of the square root system is always larger than 15.9%. This is larger than calculated for the Constitutional Treaty, and far more than promised by the Treaty of Nice rule. Slomczynki and Zyczkowski (2007b) point out that the efficiency of the square root system does not decrease with an increasing number of members states, whereas the efficiency of the double majority rule does.

Gros et al. (2007: 2) observe that it "is widely assumed that the insistence of the Polish government on the square root approach is motivated by the desire to increase its voting power." However, Gros et al. argue that their figures show

> "that this will not necessarily be the case. Poland is in general unlikely to gain a lot from the square root approach because it is nearly a big member state: 21 member states are smaller than Poland, and only 5 are larger. Any formula that gives more (relative) weight to smaller member countries is thus likely to affect Poland in a similar way as the other large member countries." (Gros et al. 2007: 2)

When we discuss schemes of qualified majority, seat distributions, and weighted voting we should keep in mind that there are still substantial areas of Council decisions that are subject to unanimity, e.g. foreign and security policy. Moreover, even when the qualified majority rule applies, the Council does not always make use of it, but searches for unanimous agreement if the policy implementation needs the support of all member states, and it does not vote against particular member states that are crucial to the success of the policy. Why, then, is voting power so important? Kauppi and Widgrén (2004, 2007) show that the distribution of voting power in the Council can explain most of the allocation of the EU budget. They conclude that power indices

> "do a good job of capturing the actual distribution of power among EU members. Of course, one cannot directly verify the accuracy of such indices since it is impossible to directly measure power. Instead, we evaluate whether our power measures help us understand the 'footprints' that the exercise of power leaves in the data. The idea is simple. Since all nations would welcome more spending in their nation and all would resist a cut in spending, the EU budget allocation across members is one manifestation of power that is both observable and quantifiable" (Kauppi and Widgrén 2004: 224).

Their analysis leads them to the conclusion that a major part of the Council decisions can be explained by power politics. The pure Shapley-Shubik index of a priori voting power explains 70% of the EU budget allocation. The modified Shapley-Shubik index, taking care of

relatively stable cooperation structures in the EU such as the Franco-German axis, accounts for over 90% of the variation in budget shares.

One might be tempted to use the budget shares as a proxy for voting power and responsibility for EU policy. If we discuss the results of Kauppi and Widgrén with respect to responsibility, we have to take into consideration that the contributions to the EU budget are approximately 1% of GDP of the EU member countries; it is, in other words, a flat tax.[13] There are good arguments to take the economic potential of membership into account when it comes to deciding what the EU can do. One might argue that here task responsibility is necessary to define and expand what an agent, here the EU, can do. It specifies "whose job it is to see to it that certain tasks are performed and certain things are accomplished" (Goodin 1998: 150).[14] But political responsibility is quite different when it derives from voting power as a result of the Treaty of Nice or the Constitutional Treaty. The analysis of Bertini et al. (2005) demonstrates that voting power varies substantially depending on whether we take GDP (and thus contributions to EU budget) or population as the determinant for seat allocation. As already noted, Poland will be allocated 1.80% of seats in the EP if the apportionment is based on GDP and 8.04% if it is based on population. The corresponding power values are 1.79% and 7.93%. Of course, this result is also valid for the Council under the apportionment rules. The fact that Bertini et al. apply the Banzhaf index while Kauppi and Wigrén's argument rests on the Shapley-Shubik index does not dwarf the gap that exists between a responsibility that refers to economic resources, on the one hand, and to population, i.e. voters, on the other. For a large number of players, and 27 is such a large number, these indices show very similar values.

3.3 EU Codecision

There is still a puzzle to solve: Why does the allocation of the budget follow national voting power distribution in the Council, as demonstrated by Kauppi and Widgrén, while annual

[13] In a private e-mail communication (26 September 2010) Richard Baldwin added ,"There is some gaming with the UK rebate, but basically they decided to stick with the flat tax and haggle over the expenditure." And he continued "…a more complex 'tax' system could produce manipulation by the member states (they already do this with the VAT contribution) that would waste a lot of time and effort on all sides."

[14] For a discussion and application of Goodin's task responsibility, see King (2006). This concept is closely related to Miller's remedial responsibility: "To be remedially responsible for a bad situation means to have a special obligation to put the bad situation means to have a special obligation to put the bad situation right,…The Problem is to find a principle, or set of principles, for assigning such responsibilities which carries moral weight, so that we can say that agents who fail to discharge their remedial responsibilities act wrongly and may properly be sanctioned" (Miller 2001: 454). In this paper we also look for principles but in the case of EU decision-making we should neither rely on moral weight and nor wait for bad situations.

spending plans are negotiated between the EP and the Council on the basis of a proposal by the Commission? The EP is organized along ideology based party factions and members of the EP are said not to follow narrowly defined national interests. Is the Council the stronger institution although both institutions are meant to have equal influence on the budget?

Napel and Widgrén (2006) analyze the power relations of the Council and the EP in the EU legislation under the codecision procedure as a noncooperative game, i.e., both institutions are assumed to act strategically. Their results are that (a) the procedure favors the status quo and (b) the Council has a stronger a priori influence on the outcome than the EP. Both results are due to the qualified majority rule of the Council (whereas the EP only applies simple majority voting). Thus the low decision-making efficiency of the Council, discussed above, carries over to the codecision procedure.

At some stage of the sequential game that the Council and the EP play in the model of Napel and Widgrén, Conciliation Committees enter the arena. Such a committee is composed of the representatives of EU member states – at the time of the study these numbered 25 – representing the Council and a delegation of EP members of the same size. It is interesting to note that here the Union of States principle reflected in rule (b) of the Treaty of Nice determines the representation of the Council. This is generally not taken into consideration when the a priori voting power distribution in the Council is analyzed as a weighted voting game. On the other hand, Napel and Widgrén have, in addition to making use of stylized procedural rules that determine the strategies of the players, made rather crude assumptions on the preferences of the players, i.e., the Council, the EP and the Conciliation Committees, to get a full description of a game model. The individual members of the Council and the EP, also when they are members of a Conciliation Committee, are assumed to have single-peaked preferences. Of course, the latter is a strong assumption, given that many EU policies have a strong distributional character and thus are prone to cyclical majorities and unstable voting outcomes. The fact that we cannot observe a high degree of instability, resulting in prevalent revisions of decisions, seems to be the result of excessive logrolling. The Franco-German alliance is a manifestation of such a policy.

3.4 Power measures in the EU

As Leech (2003: 485) summarizes:

> "An understanding of where power lies requires us to take account of many relevant factors: the political complexions of governments, the Paris-Bonn axis, the commonality among the Benelux countries, the Nordic or Mediterranean members,

> the small states versus the large states, new Europe versus old Europe, the Eurozone, etc. […] But from the point of view of the design of the formal voting system in a union that is expanding with the admission of new members being quite a normal process, it would clearly be inappropriate to base constitutional parameters like voting weights on such considerations. That might lead to, for example, allocating France smaller voting weights because otherwise its tendency to vote with Germany would give it more power, and the UK larger weight because of its tendency to independence. That would appear arbitrary and would fail to provide a guide for what the votes of new entrants should be. Far better to allocate the voting weights on the basis of general philosophical principles that can be seen to apply equally to all countries and citizens, to new members as well as old ones."

Leech (2003: 485) concludes: "A priori power indices are useful in this."

As demonstrated in Napel and Widgrén (2006), there could be other ways for achieving a better understanding of power relations in the EU. In general, power indices are inadequate for forecasting a particular result, as decisions are driven by preferences (and ideologies). But they seem appropriate behind a Napel and Widgrén (2006) veil of ignorance when the agents and their preferences are not yet determined or when the particular preferences of the agents should not matter, as in the analysis of the functioning of institutions like the Council and the EP.

4. Freedom of choice and power

There seems to be an intuition that directly links power to responsibility. However, power is a colorful concept. Above it was more or less defined on the notion of potential influence, i.e., the number of swing positions a player controls. If we accept this notion then we can conclude that power is what the power indices measure. But is it power that makes us responsible or is it the freedom of choice that seems to go with it that is the source of responsibility? If you have no alternatives to choose from, how can you be responsible? Can you have power without freedom of choice? If we can demonstrate that freedom of choice can be fully represented by power, then some of these questions might no longer be relevant. This, however, requires us first to clarify what we mean by freedom of choice and how we measure it. The latter is important as our power concept is based on measuring.

4.1 A conceptual framework of measuring freedom

The following conceptual framework concurs with Pattanaik and Xu (1990). X is the set of opportunities. Z is the power set of X. It has X, $\varnothing$ and all A, B $\subseteq$ X as its elements. *R* is the

freedom of choice relation such that, for all A, B ∈ Z, A*R*B expresses: "The degree of freedom of choice of A is at least as large as the degree of freedom of B." That is, *R* is a binary relation with respect to the opportunity sets in Z. In what follows we look at three specifications of R which are $R_{\#}$, R_{α}, and $R_{\subseteq}$,

The *R* relation supports the definition of two other relations, *I* and *P*. (i) If A*R*B and B*R*A, then A*I*B: "The degree of freedom of choice of A is as large as the degree of freedom of B." this is the equality relation of freedom of choice. (ii) If A*R*B and *not* B*R*A, then A*P*B: "The degree of freedom of choice of A is larger than the degree of freedom of B." This is the strict freedom of choice relation.

The similarity to the definition of preference relations is obvious. However, freedom of choice does not consider preferences. In fact, there are no agents to whom preferences can be assigned. There are however concepts of freedom of choice that identify the value of a choice set with its “best” element. Such an approach presupposes preferences. There might even be a straightforward relationship between an individual i’s preferences and i’s freedom of choice, *R*, which is of interest when studying decision-making. *R* could have an impact on i’s wellbeing in addition to the choice as such, i.e., it could be an argument of i’s utility function. Is there a preference for freedom of choice? Or, *R* could be assumed to augment social welfare, e.g., cultural diversity is considered an asset. Moreover, *R* could be of interest if preferences are not fixed (or given) when A, B ⊆ X are offered, and alternatively, *R* could be of interest if A, B ⊆ X are fuzzy and their elements are not fully fixed. (See Foster, 2010.)

4.2 A cardinality measure of freedom of choice: $R_{\#}$

Pattanaik and Xu (1990) propose three properties (axioms) that uniquely characterize the binary freedom of choice relation *R* on opportunity sets that are elements of Z, given x, y∈ X.

Property 2.1 (Simple Anonymity). For all x, y in X, {x}*I*{y}.
This property expresses indifference between *no choice* situations.

Property 2.2 (Simple Strict Monotonicity). For all distinct x, y ∈ X, {x, y}*P*{x}.
This property compares a choice and a *no choice* situation.

Property 2.3 (Simple Independence). For all A,B ∈ Z and all x ∈ X\(A∪B) follows [A*R*B ⇔ A∪{x}*R*B∪{x}]

Property 2.3 implies that the existence of alternative x has no impact on how we rank A and B with respect to freedom of choice, i.e., the *R* ranking of A and B is *independent* of whether there is an alternative x or not. Does this make sense?

Pattanaik and Xu (1990) prove that the only specification of *R* that satisfies these properties is the counting relation $R_{\#}$: The degree of freedom of choice of A is at least as large as the degree of freedom of B, if the number of elements in the set A is at least as large as the number of elements in set B, i.e., $AR_{\#}B \Leftrightarrow |A| \geq |B|$.

There are a series of arguments that question the above axioms and the result that Pattanaik and Xu derived. Here is a short list:

(i) $R_{\#}$ ignores the preferences of the individuals to whom the set of alternatives are allocated.

(ii) $R_{\#}$ ignores complementary and substitutional relationships among the alternatives (as it assumes "strict" independence).

(iii) $R_{\#}$ does not take into account of differences in value (prices) between elements of X.

(iv) $R_{\#}$ ignores the *capability* of the decision maker to make use of the various alternatives in X.[15]

4.3 The α-ordering and inclusion

A further elaboration of the freedom of choice concept that takes care of the above critical arguments seems to be a straightforward project. Marlies Klemisch-Ahlert (1993) defines an ordering R_α such that for all A, B $\in$ Z,

$$(1) \qquad AR_\alpha B \Leftrightarrow \sum_{x \in A} \alpha(x) \geq \sum_{x \in B} \alpha(x)$$

In (1), α is a mapping that assigns a weight $\alpha(x) > 0$ to every x in X. More specifically, α maps the elements of the set X into a finite space of positive and finite real numbers. We can think of α representing a pricing function, but this is only a thought experiment, because prices do not exist or are not considered relevant for measuring freedom of choice.[16]

[15] Argument (iv) is due to Sen (1985); it triggered a substantial discussion. In a recent OPHI Working, Foster (2010) incorporates capabilities into the axiomatic freedom of choice approach. The result "can be viewed as providing the theoretical basis for empirical measures of capabilities" (Foster 2010: 3).

[16] If prices exists and are considered relevant then we could simply compare budget sets for measuring freedom of choice. See Screpanti (2006, 2009) for such an application.

Alternatively, we can think of α representing social values that result from empathy and face-to-face social interaction, "washed up on the beach along with the human race by the forces of biology and social evolution" as proposed by Binmore (1998: 9). Of course, the choice of α can reflect legal constraints and priorities. Or, it could express the political salience of the various alternatives in the perception of the voters and the eyes of the media. In this case, it might be highly relevant for defining the freedom of choice of EU politicians and perhaps even more so for the national governments.[17] The manipulation of salience, i.e., salience policy, can be a rather successful political tool. Can we interpret the New Approach on European standardizsation with its reference to mutual recognition, noted above, as an intentional shifting of salience?

An ordering which satisfies (1) is called an α-ordering. The α-ordering R_α satisfies *Properties 2.2 and 2.3.*, however, it satisfies *Property 2.1* only if $\alpha(x) = \alpha(y)$, *which is in general not the case*. As a consequence Klemisch-Ahlert (1993) introduced

Property 2.4: For all x, y in X, $\{x\}R\{y\} \Leftrightarrow \alpha(x) \geq \alpha(y)$.

Then she demonstrated that R_α satisfies Properties 2.2, 2.3, and 2.4 if condition (1) applies. In general, there are many α-orderings that satisfy these properties. Can we propose conditions such that (1) holds, irrespective of the specification of α?

Klemisch-Ahlert (1993) shows that if we cannot exclude any particular α-ordering, only constrained by $\alpha: X \rightarrow]0,\infty[$, then we can compare the freedom of choice with respect to A and B only if B is a subset of A or A is a subset of B, or both, i.e., if there is *inclusion*. The inclusion ordering $R_\subseteq$ is defined as:

For all A, B $\in$ Z and B $\subseteq$ A $\Rightarrow$ A$R_\subseteq$B.

If this relationship applies, then we have $\sum_{x \in A} \alpha(x) \geq \sum_{x \in B} \alpha(x)$ and condition (1) holds.

$R_\subseteq$ is the inclusion relation of freedom of choice. It defines an incomplete ordering as many choice sets cannot be compared with respect to this relation. The inclusion relation is also relevant for the interpretation of power measures. In fact, we will demonstrate a close

[17] In fact, politicians might have an interest to shape the α-function. For the public choice theory of political salience, see Schofield (2009).

correspondence between the freedom of choice and power as measured by the Public Good Index.

4.4 Power, the PGI and $R_{\#}$

In what follows, we will restrict ourselves to voting power: this is the kind of power that seems to be quantifiable. Perhaps this is the reason why it dominates the power discussion in the EU. It is defined as the impact an individual voter (or bloc of voters) has on the outcome of a vote where the outcome is defined as winning or losing, i.e., as satisfying a given decision rule d (e.g., a majority quota q) or not. If N is the set of voters (agents, players, decision makers) and S is a subset of N, then S is a winning coalition if it satisfies d and it is a losing coalition if not. If S is a winning coalition and S\{i} is a losing one, then i has a swing – and exerts power. Similarly, i has a swing if S is losing and $S \cup \{i\}$ is winning.

If S is a winning coalition we assign the value of 1 to it, v(S) = 1, if S is losing then we assign the value of 0, v(S) = 0. This defines a simple game which is the standard model of a voting game.

When it comes to Europe, we are hardly ever interested in who forms a winning coalition, but what in what decision is made. Of course, this decision is the result of coalition formation. But what seems to matter is the outcome, and not who supported it. If we think of EU policies, then many possible outcomes have properties that define a (pure) public good: non-exclusion and non-rivalry in consumption. This is one of the arguments why we apply the Public Good Index (PGI) to discuss voting power and relate it to freedom of choice: we consider the set of minimum winning coalitions (MWCs) and count how often i has a swing. Note that each member of a MWC has a swing, i.e., there are no surplus players in S if S is a MWC.

For illustration and further discussion, let us assume a voting body (i.e. a weighted voting game $v = (d, w)$ with a decision rule d = 51 and distribution of voting weights $w = (w_1, w_2, w_3, w_4, w_5) = (35, 20, 15, 15, 15)$. Thus we have $v° = (51; 35, 20, 15, 15, 15)$ for the voting body where N = {1, 2, 3, 4, 5} is the set of players. The set of MWCs is:

$$M(v°) = \{\{1, 2\}, \{1, 3, 4\}, \{1, 3, 5\}, \{1, 4, 5\}, \{2, 3, 4, 5\}\}$$

In order to get the corresponding values of the PGI, we count the number of coalitions in M($v°$) that have player i as a member, i.e., the decisiveness c_i, and divide this number by the sum of all c_i –values (which is 15 for the above game). As a result we get the PGI.

$h° = h(v°) = (4/15, 2/15, 3/15, 3/15, 3/15)$.

We see that $h°$ violates local monotonicity: although player 2 controls more voting weight than player 3 (or 4 and 5, respectively), the power value of player 2 is smaller. This is possibly the case because the game is not decisive, i.e., it could well be that votes split into equal shares of 50 and no winning coalition prevails.[18]

Now let us assume that each coalition in M($v°$) represents a different policy, i.e., public good so that, in the end, player 1 controls a set A = {a, b, c, d} and player 2 controls a set B = {a,e}. If we conclude that the power of player 1 is larger than the power of player 2, then this strictly parallels the conclusion that the freedom represented by A is larger than the freedom represented by B and there A$R_{\#}$ B and, even more specifically, A$P_{\#}$ B.

The formal equivalence of the measuring of power and freedom of choice, when the latter is related to $R_{\#}$, should not come as a surprise since both the PGI and the Banzhaf index (as well as the Shapley-Shubik index) are counting indices as classified in Malawski (2004). However, in the next section it will be demonstrated that an equivalence relation to the freedom of choice relation $R_{\subseteq}$ can be formalized for the PGI.

4.5 The $R_{\subseteq}$ - equivalence of PGI-ordering

We can formalize the PGI as

$$h_i(v) = \frac{c_i}{\sum_{i \in N} c_i}$$

where c_i, as defined above, is the number of decisive sets (i.e., MWCs) that have i as a member. Let us define the sum of all decisive positions in a game as $\sum_{i \in N} c_i = c(v)$ and let $M_i(v)$ express the set of all MWCs that have i as a member. Then PGI-monotonicity is defined as follows**:**

[18]For a discussion of non-monotonicity, see section 5 below.

Given $M_i(u) \supseteq M_i(v)$, a solution f on the set of all simple games satisfies PGI-monotonicity if, for any pair of simple games *u* and *v*,

(1) $\quad f_i(u)c(u) \geq f_i(v)c(v)$

for all player $i \in N$ holds. Alonso-Meijide et al. (2008) show that the PGI is the only index that satisfies PGI-monotonicity, symmetry, null player, and efficiency.[19] That is, we can specify f by h and substitute, in (1), f_i by h_i.

Of course, the ordering that derives from a direct application of PGI-monotonicity is incomplete as there are many games *u* and *v* such that $M_i(u) \supseteq M_i(v)$ does not apply. However, PGI-monotonicity allows us to discuss the problems as follows:

(i) Can we conclude from $M_i(u) \supseteq M_i(v)$ that i has at least as much freedom of choice in game *u* than in game *v*?

(ii) Can we conclude from $M_i(u) \supseteq M_j(u)$ that i has at least as much freedom of choice in game *u* than j?

(iii) Can we conclude from $h_i(u) \geq h_j(u)$ that i has at least as much freedom of choice in game *u* than j?

Note if $h_i(u) > h_i(v)$, then, in accordance with $R_{\subseteq}$, we conclude that game *u* contains more freedom of choice than game *v* for agent i if $M_i(u) \supset M_i(v)$ and $M(u) \subseteq M(v)$ hold. Moreover, if $h_i(u) > h_i(v)$, then, in accordance with $R_{\#}$, we conclude that game *u* contains more freedom of choice than game *v* for agent i if $c_i(u) > c_i(v)$ and $c(u) \leq c(v)$ hold. Of course, $M(u) \subseteq M(v) \Rightarrow c(u) \leq c(v)$, but the reverse does not "necessarily" hold.

5. Collective choice, power and causality

The specification of causality in the case of collective decision-making with respect to the individual agent cannot be derived from the action and the result as both are determined by the collectivity. They have to be traced back to decision-making. However, collective decision-making has a quality that differs substantially from individual decision-making. For instance, an agent may support his favored alternative by voting for another alternative or by not voting at all. Nurmi (1999, 2006) contains a collection of such "paradoxes".

[19] See Alonso-Meijide et al. (2008) for definitions.

These paradoxes tell us that we cannot derive the contribution of an individual to a particular collective action from the individual's voting behavior. Trivially, a vote is not a contribution, but a decision. Resources such as voting power, money, etc. are potential contributions and causality might be traced back to them if collective action results. As a consequence causality follows even from votes that do not support the collective action. This is reflected in everyday language when one simply states that the Parliament has decided, when in fact decision was made by a majority smaller than 100 percent. We say the EU has decided even when there was strong, but not decisive, resistance in the EP and only a qualified majority in the Council agreed. But how can we allocate causality if it is not derived from decisions?

5.1 The potential to act

Imagine a five-person committee N = {1, 2, 3, 4, 5} that makes a choice between the two alternatives *x* und *y*. The voting rule specifies that *x* is chosen if either (i) 1 votes for *x*, or (ii) at least three of the players 2-5 vote for *x*. Let us assume that all individuals vote for *x*. What can be said about causality? Clearly this is a case of over-determination and the allocation of causation is not straightforward. The action of agent 1 is an element of only one minimally sufficient coalition, i.e., decisive set, while the actions of each of the other four members are in three decisive sets each. If we take the membership in decisive sets as a proxy for causation, and standardize such that the shares of causation add up to one, then vector

$$h^{\circ} = (\frac{1}{13}, \frac{3}{13}, \frac{3}{13}, \frac{3}{13}\ \frac{3}{13})$$

represents the degrees of causation.[20] Braham and van Hees (2009: 334), who introduced and discussed the above case, conclude that "this is a questionable allocation of causality." They add that "by focusing on minimally sufficient coalitions, the measure ignores the fact that anything that players 2-5 can do to achieve *x*, player 1 can do, and in fact more – he can do it alone."

[20] An alternative measure of "degree of causation" and responsibility is introduced in Chockler and Halpern (2004). It builds on contingency: If a candidate wins an election with 11-0 then a voter who voted for this candidate is less responsible for the victory than if the candidate had won 6-5, but still the voter is responsible under the counterfactual contingency that there could be a 6-5 vote. Similarly, Felsenthal and Machover (2009) allocate responsibility after the decision is made and known.

Let us review the above example. Imagine that *x* stands for polluting a lake. Now the lake is polluted, and all five members of N are under suspicion for having polluted it. Then *h*° implies that the share of causation for 1 is significantly smaller than the shares of causation of each of the other four members of N. If responsibility and perhaps punishment follow causation then the allocation *h*° seems highly pathological. As a consequence Braham and van Hees propose to apply the weak NESS instead of the strong one, i.e., not to refer to decisive sets, but to consider sufficient sets instead and count how often an element *i* of N is a necessary element of a sufficient set (i.e., a NESS).[21] Taking care of an adequate standardization so that the shares add up to 1, we get the following allocation of causation:

$$b^\circ = (\frac{11}{23}, \frac{3}{23}, \frac{3}{23}, \frac{3}{23}, \frac{3}{23}).$$

The result expressed by *b*° looks much more convincing than the result proposed by *h*°, does it not? Note that the *b*-measure and *h*-measure correspond to the Banzhaf index and the PGI, respectively, and can be calculated accordingly.

So far the numerical results support the weak NESS test and thus the application of the Banzhaf index. However, what happened to alternative *y*? If *y* represents "no pollution" then the set of decisive sets consists of all subsets of N that are formed of the actions of agent 1 and the actions of two out of agents 2, 3, 4, and 5. Thus the actions of 1 are members of six decisive sets while the actions of 2, 3, 4, and 5 are members of three decisive sets each. The corresponding shares are given by the vector

$$h^* = (\frac{1}{3}, \frac{1}{6}, \frac{1}{6}, \frac{1}{6}, \frac{1}{6})$$

Obviously, *h** looks much more convincing than *h*° and the critical interpretation of Braham and van Hees does no longer apply: agent 1 cannot bring about *y* on its own, but can cooperate with six different pairs of other agents to achieve this goal.

Note that the actions (votes) bringing about *x* represent an improper game – two "winning" subsets can exist at the same time[22] - while the determination of *y* can be described

[21] For a discussion of the NESS test, see Braham (2005, 2008) and Braham and Holler (2009). This literature refers to earlier work by Wright (1985, 1988).

[22] Note that the result x implies the possibility of over-determination. Wright (1985) has identified two types of over-determination: *duplicative* and *pre-emptive* causation. "A case of duplicative causation is one in which two similar and independent causal processes *C*1 and *C*2 , each of which is sufficient for the same effect *E*, may culminate in *E* at the same time" (Braham and Holler 2009: 149). This applies to x, the case of pollution.

as a proper game. However, if there are only two alternatives *x* and *y* then "not *x*" necessarily implies *y*, irrespective of whether the (social) result is determined by voting or by polluting. The *h*-values indicate that it seems to matter what issue we analyze and what questions we raise while the Banzhaf index with respect to y is the same then for x: $b^\circ = b^*$.

The formal rules of EU decision-making seem to guarantee properness, and thus the strong NESS test and the PGI might be adequate instruments. However, as discussed above, decision-making efficiency is more likely to be a problem as the corresponding game often lacks decisiveness.

5. 2 The challenge of nonmonotonicity

Whether we should apply *h* or *b*, or a third alternative, to measure causation is still an open question, and one this paper will not answer. However, if we want to relate responsibility to power then the nonmonotonicity, i.e., the violation of local monotonicity, that represents the strong NESS test of the PGI is quite a challenge: If the collective choice is made through voting then it is not guaranteed that a voter with a larger share of votes has at least as much responsibility for the collectively determined outcome as a voter with a smaller share. If we review the discussion of voting weights in the EU Council then we might wonder.

From the above example we can learn that nonmontonicity might indicate that we asked perhaps the wrong question: Is the responsibility with respect to keeping the lake clean or is it with polluting and then perhaps sharing the costs of cleaning it? Felsenthal and Machover (1998: 221ff) argue that any a priori measure of power that violates local monotonicity is 'pathological' and should be disqualified as serving as a valid yardstick for measuring power. In Holler and Napel (2004a, 2004b), we argue that the PGI shows nonmonotonicity (and thus confirms that the measure does not satisfy local monotonicity) if the game is not decisive, as the weighted voting game $v^\circ = (51; 35, 20, 15, 15, 15)$ discussed in section 4.4 demonstrates, or is improper and therefore indicates that perhaps we should worry about the design of the decision situation. The more popular power measures, i.e., the Shapley-Shubik index and the Banzhaf index, satisfy local monotonicity and thus do not indicate any particularities if the game is not decisive or is improper. Interestingly, these measures also show a violation of local monotonicity if we consider a priori unions, and the equal probability of permutations and coalitions, respectively, does no longer apply. The

concept of a priori unions or pre-coalitions is rather crude because it implies that certain coalitions will not form at all, i.e., have a zero probability of forming.[23]

Note since the PGI considers MWCs only, this is formally equivalent to putting a zero weight on coalitions that have surplus players. Is this the ("technical") reason why the PGI may show nonmonotonicity? However, instead of accepting the violation of monotonicity, we may ask for what decision situations the PGI guarantees monotonic results - this may help to design adequate voting bodies. In Holler et al. (2001), the authors analyze alternative constraints on the number of players and other properties of the decision situations. For example, it is obvious that local monotonicity will not be violated by any of the known power measures, including PGI, if there are n voters and n-2 voters are dummies. It is, however, less obvious that local monotonicity is also satisfied for the PGI if one constrains the set of games so that there are only n-4 dummies. A hypothesis that needs further research is that the PGI does not show nonmonotonicity if the voting game is decisive and proper and the number of decision makers is lower than 6.[24]

To conclude, the PGI and thus the strong NESS concept may produce results that are counterintuitive at first glance. However, in some decision situations they seem to tell us more about the power structure and the corresponding causality allocation than the Banzhaf index and the corresponding weak NESS concept do.

6. The power-responsibility scheme summarized

The conclusion of the above exercise is that reponsibility can be allocated in relation to power. This scheme takes care of both causality and freedom of choice. One of the implications is that we can link the concepts of freedom of choice and power to responsibility because membership of controlling coalitions can be interpreted as a proxy of causality and the responsibility of the individual decision maker for the social outcome.

There are immediate theoretical applications for this measure of responsibility. In particular, this approach can be seen as an alternative to welfare calculation and utility maximization, which seem to dominate the Law and Economics literature. The approach to responsibility that is suggested here accounts for the observation that people often compare social states and social systems with respect to the degree of freedom and the distribution of

[23] See Alonso-Meijide and Bowles (2005) for examples of voting games with a priori unions and Holler and Nurmi (2010) for a discussion.
[24] Perhaps this result also holds for a larger number of decision makers but I do not know of any proof. For a related discussion and the introduction of weighted monotonicity, see Alonso-Meijide and Holler (2009).

power and responsibility independent of preferences and welfare calculations. It also takes care of theoretical arguments which suggest that power and responsibility should be evaluated without reference to preferences.[25] The binding nature of law is not because it matches the agent's preferences but because it concurs with the agent's capacity to fulfill an obligation. In fact, the capacity to act creates the obligation and the related freedom of choice is the basis of the corresponding responsibility to which the law refers.

However, who is and who can be made responsible in the case of EU decision-making? In the political arena of mass democracy the individual voter's causality and concomitant responsibility is difficult to quantify, so is his or her potential of political sanctioning. For an individual voter the implementation of responsibility via voting is hardly possible. First, his or her impact is negligible – and this leads to the paradox of voting and the hypothesis of expressive behavior.[26] Second, as e.g. demonstrated in Nurmi (1999, 2006), there are all kind of traps and intricacies – euphemistically labeled paradoxes - that make voting a rather unreliable instrument, at least if there are more than two alternatives.

To conclude, if the collectivity, the State, makes irresponsible choices then the responsibility of a voter cannot be derived from his vote, because, in general, a single vote has no causal effect on the outcome no matter whether the square root rule is applied to the allocation of votes, or not. This is how collective responsibility comes into play implying that every member of a collectivity is responsible for what the collectivity does or fails to do, irrespective of the member's contribution to the decision that underlies the collectivity's behavior. This results in responsibility via membership. It raises the question of what the relevant collectivity is and how we can choose membership. When it comes to the State as the agent of one's country, the question is do we have a choice?

Owing to the EU, the potential of mobility has substantially increased and "voting with one's foot" looks like a possible option. If you are not satisfied with your government you can choose another member country for your residence. (Note that, in general, you have no voting rights in your new country as long as you do not become one of its citizens.) However, in practical terms David Hume's verdict still holds for a large share of the EU population as the low mobility within the EU shows:

> "Can we seriously say, that a *poor peasant* or artizan has a free choice to leave his country, when he knows no foreign language or manners, and lives from day to day, by the small wages which he acquires? We may as well assert, that a man, by

[25] See Braham and Holler (2005a, b) and Napel and Widgrén (2004, 2005) for opposing views on the relationship of power and preferences. (For a comment, see Holler and Nurmi 2010. Compare Holler and Widgrén 1999.)
[26] For the "possible irresponsibility" of expressive voting, see Hillman (2010).

> remaining in a vessel, freely consents to the dominion of the master; though he was carried on board while asleep, and must leap into the ocean, and perish, the moment he leaves her" (Hume 1985 [1777]: 475).

Still, mobility in the EU is an important issue and might be highly relevant for assigning responsibility. But this has to be studied in another paper. Another string of arguments that deserve further discussion, derives from the precautionary principle (Ahteensuu 2011): If we cannot solve the problem of responsibility then, one might argue, the corresponding decision should not be made.[27] If we apply this principle to today's situation, then a severe lack of "necessary" decisions could be the consequence. The precautionary principle and it consequences could motivate rethinking political responsiveness. A more substantial participation of the EP, also balancing its power with the Council (e.g., by reducing the qualified majority quota of the latter[28]) could be a first step to establishing political responsibility. Another possible means to increase citizen participation and thus enhance the potential of political responsibility could be the direct election of the representatives that the member countries assign to the Commission.

In the Republic of San Marino, every six months, the proportionally elected multi-party Council selects two Captains to be the heads of state. These Capitani Reggenti are chosen from opposing parties so that there is a balance of power. They serve a six-month term, and a subsequent re-election is not possible. Once their six-month term is over, citizens have three days in which to file complaints about the Captains' activities. If they warrant it, judicial proceedings against the ex-head(s) of state can be initiated.[29] Should the European Court of Justice evaluate the policies of the Council and the EP? Perhaps impartial commenting could help to make voters more aware of EU decision-making and thus increase political responsibility. However, there have to be more effective ways for the voter to hold his or her representatives accountable than to vote every four years, if responsibility is to work.

Acknowledgement

[27] This presents a slight modification (or an extension) of the common understanding of the precautionary principle which calls for early measures to avoid and mitigate environmental damage and health hazards in the face of scientific uncertainty. (See Ahteensuu 2011.) The relevant kinds of uncertainties are concerned not only with the causal link between an action (or a decision) and an effect, but also with the inability to assign responsibility.

[28] This follows from Napel and Widgrén (2006) discussed in section 3.3.

[29] The practice of multiple heads of state and the frequent elections of the heads of state are derived directly from the rules that governed the Roman Republic. See Machiavelli's *Discorsi* for an involved analysis of the Roman Republic.

Marko Ahteensuu, Richard Baldwin, Leonidas Donskis, Gianfranco Gambarelli, Nicola Maaser, Chell Mann, Jacek Mercik, Jacques Pelkmans, Sina Rummelhagen, Philipp Schliffke, Johannes Schwarze, Izabella Stach, George Tsebelis and Giuliana Zibetti.

References

Ahteensuu, M. (2011): The Precautionary Principle in Environmental and Health Risk Governance: A Philosophical Analysis´. Munich: Oldenbourg.

Alonso-Meijide, J.M./Bowles, C. (2005): Power indices restricted by a priori unions can be easily computed and are useful: A generating function-based application to the IMF. In: Annals of Operations Research 137, 21-44.

Alonso-Meijide, J.M./Casas-Mendez, B./Holler, M.J./Lorenzo-Freire, S. (2008): Computing Power Indices: Multilinear extensions and new characterizations. In: European Journal of Operational Research 188, 540-554.

Alonso-Meijide, J.M./Holler, M.J. (2009): Freedom of Choice and Weighted Monotonicity of Power. In: Metroeconomica 60(4), 571–583

Baldwin, R./Widgrén, M. (2004): Winners and losers under various dual majority rules for the EU's Council of Ministers. In: Wiberg, M. (ed.), Reasoned Choices, Essays in Honor of Academy Professor Hannu Nurmi on the occasion of his 60th birthday, Turku: Digipaino, 42-92; also CEPR Discussion Paper No. 4450, June 2004.

Berg, S. and Holler, M.J. (1986): Randomized decision rules in voting games: A model of strict proportional power. In: Quality and Quantity 20, 419-429.

Bertini, C./Gambarelli, G./Stach, I. (2005): Apportionment strategies for the European Parliament. In: Gambarelli, G./Holler, M.J. (eds.), Power Measures III (Homo Oeconomicus 22: 589-604.). Munich: Accedo Verlag.

Binmore, K. (1998): Game Theory and the Social Contract, Volume II, Just Playing. Cambridge, Mass., and London: The MIT Press.

Braham, M. (2005): Causation and the Measurement of Power. In: Gambarelli, G./Holler, M.J. (eds), Power Measures III (Homo Oeconomicus 22**).** Munich: Accedo-Verlag, 645-553..

Braham, M. (2008): Social Power and Social Causation: Towards a formal synthesis. In: Braham, M./ Steffen, F. (eds), Power, Freedom, and Voting: Essays in Honour of Manfred J. Holler. Berlin and Heidelberg: Springer, 1-21.

Braham, M./Hees, M. van (2009): Degrees of causation. In: Erkenntnis 71, 323-344.

Braham, M./Holler, M.J. (2005a): The impossibility of a preference-based power index. In: Journal of Theoretical Politics 17, 137-157.

Braham, M./Holler, M.J. (2005b): Power and preferences again: A reply to Napel and Widgrén. In: Journal of Theoretical Politics 17, 389.

Braham, M./Holler, M.J. (2009): Distributing Causal Responsibility in Collectivities. In: Gekker, R./Boylan, T. (eds), Economics, Rational Choice and Normative Philosophy. London and New York: Routledge, 145-163.

Breton, A./Galeotti, G./Salmon, P./Wintrobe, R. (eds.) (2007): The Economics of Transparency in Politics (Villa Colombella Papers). Aldershot: Ashgate Publishing.

Chockler, H./Halpern, J.Y. (2004): Responsibility and blame: A structural-model approach. In: Journal of Artificial Intelligence Research 22, 93-115.

Cichocki, M.A./K. Zyczkowski (eds.) (2010): Institutional Design and Voting Power in the European Union. Farnham (England) and Burlington (USA): Ashgate.

Felsenthal, D./Machover, M. (1998): The Measurement of Voting Power. Theory and Practice, Problems and Paradoxes. Cheltenham: Edward Elgar.

Felsenthal, D./Machover, M. (2001): The Treaty of Nice and Qualified Majority Voting. In: Social Choice and Welfare 18, 431–64.

Felsenthal, D./Machover, M. (2009): A note on measuring voters' responsibility. In: Homo Oeconomicus 26, 259-271.

Foster, J.E. (2010): Freedom, Opportunity and Wellbeing. In: Oxford Poverty & Human Development Initiative (OPHI), Working Paper No. 35.

Glazer, A./Kanniainen, V./Puutvaara, P. (2010): Firms' ethics, consumer boycotts, and signalling. In: European Journal of Political Economy 26, 340-350.

Goerke, L./Holler, M.J. (1998): Strategic standardization in Europe: A public choice perspective. In: European Journal of Law and Economics 6, 95-112.

Goodin, R. (1998): Social welfare as a collective social responsibility. In: Schmidtz, D./Goodin, R. (eds), Social Welfare and Individual Responsibility. Cambridge, Cambridge University Press.

Gros, D./ Kurpas, S./Widgrén, M. (2007): Weighting votes in the Council: towards a 'Warsaw compromise'? In: VOX: Research-based policy analysis (20 June2007), 1-5.

Hillman, A. (2010): Expressive behavior in economics and politics. In: European Journal of Political Economy 26, 403-418.

Holler, M.J. (1985): Strict proportional power in voting bodies. In: Theory and Decision 19, 249-258.

Holler, M.J. (2007): Freedom of choice, power, and the responsibility of decision makers. In: Josselin, J-M./Marciano, A. (eds.), Democracy, Freedom and Coercion: A Law and Economics Approach. Cheltenham: Edward Elgar, 22-45.

Holler, M.J. (2011): Efficiency or Obfuscation? Comment on "Mutual Recognition" by Jacques Pelkmans. Forthcoming.

Holler, M.J./Kellermann, J. (1977): Power in the European Parliament: What will change? In: Quality and Quantity 11, 189-192.

Holler, M.J./Napel, S. (2007): Democratic decision procedures, stability of outcome, and agent power, with special reference to the European Union. In: Pardo, J.C./Schwartz, P. (eds.), Public Choice and the Challenges of Democracy. Cheltenham: Edward Elgar, 220-234.

Holler, M.J./Napel, S. (2004a): Local monotonicity of power: Axiom or just a property. In: Quality and Quantity 38, 637-647.

Holler, M.J./Napel, S. (2004b): Monotonicity of power and power measures. In: Theory and Decision 56, 93-111.

Holler, M.J./Nurmi, H. (2010): Measurement of Power, Probabilities, and Alternative Models of Man. In: Quality and Quantity 44, 833-847.

Holler, M.J./Ono, R./Steffen, F. (2001): Constrained Monotonicity and the Measurement of Power. In: Theory and Decision 50, 385-397

Holler, M.J./Widgrén, M. (1999): Why power indices for assessing European Union decision-making? In: Journal of Theoretical Politics 11, 321-330.

Hume, D. (1985 [1777]): Essays: Moral, Political and Literary. Indianapolis: LibertyClassics.

Kaniovski, S./Mueller, D.C. (2011): How Representative is the European Union Parliament? In: European Journal of Political Economy 27, 61-74.

Kanniainen, V./Pietarila, E. (2006): Corporate social responsibility: can markets control? In: Homo Oeconomicus 23, 153-179.

Kauppi, H./Widgrén M. (2004): What determines EU decision making? Needs, power or both? In: Economic Policy 19: 221–266.

Kauppi, H./Widgrén, M. (2007): Voting rules and budget allocation in an enlarged EU. In: European Journal of Political Economy 23, 693-706.

Kerber, W./van den Bergh, R. (2008): Mutual Recognition Revisited: Misunderstandings, Inconsistencies, and a Suggested Reinterpretation. In: Kyklos 61, 447–465.

King, P. (2006): What do we mean by responsibility? The case of UK housing benefit reform. In: Journal of Housing and the Built Environment 21, 111–125.

Klemisch-Ahlert, M. (1993): Freedom of Choice: a Comparison of Different Rankings of Opportunity Sets. In: Social Choice and Welfare 10, 189-207.

Leech, D. (2003): The utility of the voting power approach. In: European Union Politics 4, 234-242.

Magee, S.P./Brock, W.A./Young, L. (1989): Black Hole Tariffs and Endogenous Policy Theory, Cambridge: Cambridge University Press.

Magee, S.P. (1997): Endogenous protection: The empirical evidence. In: Mueller, D.C. (ed.), Perspectives on Public Choice: A Handbook. Cambridge: Cambridge University Press.

May, L./Hoffman, S. (eds.) (1991): Collective Responsibility: Five Decades of Debate in Theoretical and Applied Ethics. Savage, Maryland: Rowman & Littlefield.

Malawski, M. (2004):'Counting' power indices for games with a priori unions. In: Theory and Decision 56, 125-140.

Miller, D. (2001): Distributing responsibility. In: Journal of Political Philosophy 54,437-446.

Napel, S./Widgrén, M. (2004): Power measurement as sensitivity analysis – a unified approach. In: Journal of Theoretical Politics 16, 517-538.

Napel, S./Widgrén, M. (2005): The possibility of a preference-based power index. In: Journal of Theoretical Politics 17, 377-387.

Napel, S./M. Widgrén (2006): The inter-institutional distribution of power in EU codecision. In: Social Choice and Welfare 27, 129-154.

Nurmi, H. (1999): Voting Paradoxes and How to Deal with Them. Berlin, Heidelberg, and New York: Springer.

Nurmi, H. (2006): Models of Political Economy. London and New York: Routledge,

Nurmi, H./Hosli, M.O. (2003): Which Decision Rule for the Future Council? In: European Union Politics 4, 37-50.

Nurmi, H./ Raunio, T./Helin, J. (2007): The Best Represented Voters in Europe: An a priori Voting Power Analysis of the 2004 Elections for the European Parliament. In: Homo Oeconomicus 24: 485-500.

Pattanaik, P. K./Xu, Y. (1990): On ranking opportunity sets in terms of freedom of choice. In: Recherches Economique de Louvain 56, 383-390.

Pelkmans, J. (2007): Mutual Recognition in Goods. On Promises and Disillusions. In: Journal of European Public Policy 14, 699–716.

Pelkmans, J. (2011): Mutual recognition: rationale, logic and application in the EU internal goods market. Forthcoming.

Penrose, L.S. (1946): The elementary statistics of majority voting. In: Journal of the Royal Statistical Society109, 53-57.

Schofield, N. (2009): The Political Economy of Democracy and Tyranny. Munich: Oldenbourg-Verlag.

Screpanti, E. (2006): Progressive Taxation and the Distribution of Freedom. In: Metroeconomica 57, 1-12.

Screpanti, E. (2009): A Quasi-Natural Measure of Choice Freedom for Budget- And Time-Constrained Opportunity Sets. In: Metroeconomica 60, 715-723,

Sen, A. (1985): Commodities and Capabilities. Oxford: Oxford University Press.

Slomczynski, W./Zyczkowski, K. (2006): Penrose voting system and optimal quota. In: Acta Physica Polonia B 37, 3133-3143.

Slomczynski, W./Zyczkowski, K. (2007a):From a toy model to the double square root voting system. In: Homo Oeconomicus 24, 381-399.

Slomczynski, W./Zyczkowski, K. (2007b): Jagiellonian Compromise: An Alternative Voting System for the Council of the European Union", http://chaos.if.uj.edu.pl/~karol/pdf/JagCom07.pdf.

Smith, A. (1981 [1776/77]): An inquiry into the nature and causes of the wealth of nations. In: Campbell, R.H./Skinner, A.S. (eds.), Glasgow Edition of the Works and Correspondence of Adam Smith vol. II. Indianapolis: LibertyClassics.

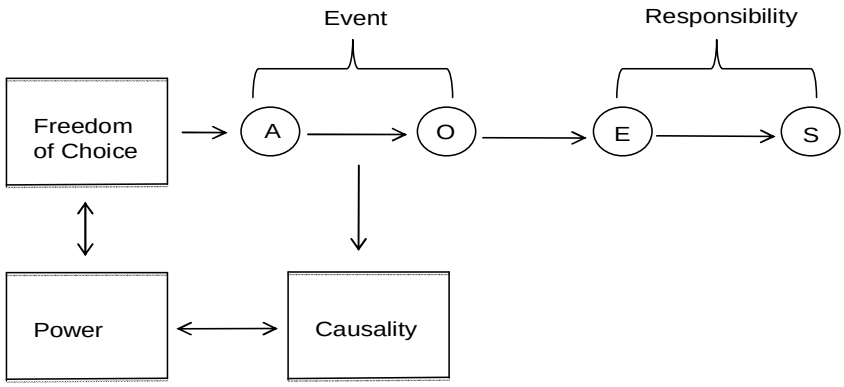
Steunenberg, B. (2001): Enlargement and Institutional Reform in the European Union: Separate or Connected Issues? In: Constitutional Political Economy 12, 351-370.

Tsakatika, M. (2008): Political Responsibility and the European Union. Manchester: Manchester University Press.

Wright, R. (1985): Causation in tort law. In: California Law Review 73, 1735–1828.

Wright, R. (1988): Causation, responsibility, risk, probability, naked statistics, and proof: Pruning the Bramble Bush by clarifying the concept. In: Iowa Law Review 73, 1001-1077.

Appendix: The power-responsibility scheme



A=action
O=outcome
E=evaluation
S=sanction, accountability