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Abstract

Network structures constrain and enable political actors. Nonetheless, few models of decision making in international politics take network relations into account. We formulate and test a network model of decision making that incorporates the influence relations among political decision makers. In the first stage of the model, decision makers influence each other's initial policy positions on controversial issues through their network relations. The extent to which this influence leads to changes in decision makers' initial policy positions depends on the presence of network ties with other actors and the relative salience of the issue to the decision makers. In the second stage of the model, decision makers take a decision on the basis of their revised policy positions. The dataset we use to test the model combines information on the network relations among the member states' representations to the EU and decision-making actors' initial policy positions on controversial issues. The network model generates more accurate predictions of decision outcomes on these issues than does an appropriate baseline model. We draw out the implications of our findings for understanding the role of network relations in international politics.

Key words: networks, decision making, legislation, European Union.

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A Network Model of Decision Making Applied to the European Union

Collective decision making in many political systems can be characterized as an influence stage followed by a decision stage. During the influence stage, the action is dominated by informal contacts among decision makers, and perhaps also actors without formal decision power. In the decision stage, decision makers must reach a decision outcome, either by voting or some other way of aggregating their policy positions. Achen notes that this general two-stage conception has been shared by a broad range of studies, including the work of Bentley.[1] Stokman and Van den Bos formalized this conception in a two-stage model of policymaking that they applied to domestic policymaking.[2] It is this model that we adapt in the present study.

Actors' informal contacts with one another, which structure the influence stage, are conceived of as network relations. The present study draws on an approach to studying networks that was developed in quantitative sociology. Social network analysis is a branch of quantitative sociology that offers a rich set of concepts and techniques with which to study social interactions.[3] Political scientists have made extensive use of social network analysis when examining the interactions among political actors in various national arenas.[4] Social network analysis has also increasingly been applied to international relations. Traditionally, IR scholars have

[1] Achen 2006a, 86; Bentley 1967[1908].

[2] Stokman and Van den Bos 1992.

[3] Wasserman and Faust 1994; Carrington *et al*. eds. 2005.

[4] Laumann and Knoke 1987; Heinz *et al.* 1993; Knoke *et al*. 1996; for a review see Thatcher 1998.

perceived and analyzed networks as a distinct mode of organization, somewhere between markets and states. The perspective of social network analysis has enabled scholars to examine networks rigorously and to ask a broad set of questions about them.[5] Networks here consist of patterns of inter-relational ties between actors. These patterns form structures, which in turn constrain and enable actors. Actors' preferences, behavior and powers are not only functions of their individual attributes and material capabilities, but also of their network relations. The structure of the network therefore affects policy outcomes.

The present study shares the focus of social network analysis on the interplay between network relations, actors and policy outcomes. The empirical focus here is decision making in the European Union (EU) on a broad selection of legislative proposals from the period 1996-2008. We study a time period in which the EU enlarged from fifteen to twenty-five and then twenty-seven member states. This enlargement is the culmination of one of the most important series of events in recent European history. We examine the stage of decision making between the introduction of the legislative proposal and the adoption of the final legislative act. After the introduction of the legislative proposal, the main actors involved are the actors with formal decision power. In the EU these actors are the European Commission, the member states in the Council of Ministers and the European Parliament. While there are many models of decision making in international politics, network relations have generally not featured prominently in them. For example, a recent survey and comparative test of models of decision making in the European Union did not contain a single model that featured network relations.[6] One class of models of decision

[5] Hafner-Burton, Kahler, and Montgomery forthcoming.

[6] Thomson *et al*. eds. 2006.

making, so-called procedural models, seeks to elucidate the ways in which formal rules of decision making impact on the final decision outcomes taken.[7] These models focus on the implications of decision rules such as which actors can introduce proposals, which actors can amend proposals, and the levels of support required for those amendments to be carried. Bargaining models, by contrast, focus on the informal norms that constrain actors during negotiation.[8] The network model elaborated in the present study is clearly closest to the bargaining models with its emphasis on the informal constraints on actors' abilities to exert influence. However, unlike the network model presented here, most current models of decision making do not incorporate network relations but assume, at least implicitly, that decision makers have equal access to each other.

In line with previous research, we test the accuracy of the network model's predictions of decision outcomes against the predictions of an appropriate baseline model, which in this case is the Nash Bargaining Solution (NBS). The Nash Bargaining Solution is a compromise model that takes the positions of all actors into account. In previous research this model prove to be a formidable competitor to supposedly more sophisticated models and therefore constitutes a tough test for the network model. The breadth of our empirical focus also allows us to examine whether networks have more impact under certain conditions, depending on the decision making procedure, the character of the policy area and the number and heterogeneity of member states involved. The importance of taking network relations into account is demonstrated by our finding that across a broad range of issues—although the

[7] For example, Tsebelis and Garrett 2000.

[8] For example, Achen 2006a; Bueno de Mesquita and Stokman eds. 2004.

differences between the models predictions are fairly small—the network model's predictions are significantly more accurate than those of the NBS model.

The Network Model and a Baseline Model

Social network analysis focuses on relational ties between units, which may be individual or collective actors. The network model developed here conceives of network relations as enduring relationships among individuals from different collective actors. In these relationships, individuals exert influence on other actors with a view to affecting their policy positions and eventually decision outcomes.

The network model is general in that sense that it is compatible with a range of ways in which actors interact with one another. The information actors share may include the policy outcomes they favor most, the intensity of their preferences, and normative justifications for their policy positions. The political strategies actors may implement in their network relations may be based on a range of modes of interaction. Some strategies may be based on highly cooperative modes of interaction, such as those based on exchange of control or voting positions on different issues.[9] Cooperative modes of interaction also include coalition building among actors with similar interests.[10] Other strategies may be based on non-cooperative modes of interaction, whereby an actor may compel other actors to adopt different policy positions to those they initially favored.[11] Alternatively, actors may attempt to change

[9] Coleman 1990; Stokman and Van Oosten 2004.

[10] Axelrod 1970; Van Deemen 1997.

[11] Bueno de Mesquita 1994.

the policy preferences of other actors by discussion on merits, thereby shifting emphasis from actors' power resources to the force of their arguments.[12] Persuasion may be cooperative (as in deliberation or communicative action) or competitive (rhetorical action).[13] The network model assumes that each actor attempts to shift other actors' policy positions toward its own policy position, and that all actors are open to at least some influence from other actors. While the network model is compatible with different modes of interaction, we believe that in the EU the prevailing norms of consensus-seeking behavior are more congruent with cooperative modes of interaction and the use of argumentation. Actors in the EU are embedded in a situation where there is a long shadow of the future, which tends to support conciliatory and cooperative behavior.

The main constraints on the extent to which an actor (ego) can influence the policy position taken by another actor (alter) is whether a network relation exists that connects the actor (ego) to that other actor (alter). We conceive of these relationships as relatively stable and enduring social structures. The data we use on networks among member state representatives in the European Union confirm that our conception of networks as stable structures is appropriate in this context. The networks are remarkably stable over time and across policy areas.[14] The strength of the network relationships is not a variable we seek to explain in our model; instead,

[12] Risse 2000; on discussion on the merits see Barry 1965, 87.

[13] AUTHOR; on deliberation see Gutmann and Thompson 1996; on rhetorical action see Schimmelfennig 2001, 63.

[14] Naurin 2007.

the model focuses on the impact of the network on the development of actors' policy positions and consequently decision outcomes.[15]

Our network model, as applied to the EU's legislative process, consists of the following two stages. The first stage begins when member state representatives and the European Parliament (EP) receive a legislative proposal from the European Commission. Member state representatives consult with their respective constituencies to identify the decision outcomes they would favor most on the policy issues raised by the legislative proposal. This results in each actor taking at least a tentative initial position on each policy issue at time *t1*. Subsequently, member state representatives influence one another through their network relations. A member state's initial policy position at time *t1* is then influenced by the policy positions of other member states to which it grants access. A first member state is more influenced by a second member state if the first has a network tie with the second state, and if the second state attaches more importance to the issue than does the first state. This influence round may result in changes to a state's initial position. After the influence round, member states have a new position at time *t2*.

The actors then enter the second stage or the decision stage, in which their revised policy positions are transformed into a decision outcome (or set of outcomes) that is binding for all. In the decision stage of the model, a forecast of the decision

[15] Some studies seek to explain the formation and dynamics of network relationships. From a rationalist perspective, some models of network formation posit that actors seek and grant access to others with a view to exerting maximal influence: for example, Stokman and Zeggelink 1996; Stokman and Berveling 1998. From a social-psychological perspective, strong network relations may also be engendered by group affinity based on perceptions of 'we' and 'others': for example, AUTHOR, Brewer and Brown 1998.

outcome is generated based on member states' revised policy positions. Depending on the decision rule that applies, the positions of the European Commission and the European Parliament are also taken into account at the decision stage. Under the consultation procedure, the policy positions of only the Commission and the member states affect the decision outcomes; the EP gives only a non-binding opinion. Under the codecision procedure, the policy positions of only the EP and the member states affect the decision outcomes; the Commission does not formally play a role in determining the decision outcomes under the codecision procedure. Both the consultation and codecision procedures can be combined with the requirement of unanimity in the Council for a bill to pass or qualified majority voting (QMV) in the Council, a form of supermajority voting.

As with all models, this two-stage network model is of course a simplification of the reality of decision-making processes in general, and of decision making in the complex system of the EU in particular. For instance, the model does not include relations between public and private actors, which have been the subject of much previous policy network research.[16] Nonetheless, interest groups are most likely to exert influence on the Commission, prior to its formulation of the legislative proposal, rather than the part of the policymaking process we examine in the present study.

In addition, our network model does not take into account the fact that member states' initial policy positions, and not only their revised positions, may also be influenced by other member states through the network relations in which they are embedded. Indeed, in other political systems, actors have been found to consult with each other before formulating their initial policy positions.[17] In the EU, it is

[16] Knoke *et al*. 1996, 6.

[17] Jones 2001, 102; Kollman 1998, 103; Laumann and Knoke 1987, 206.

reasonable to assume that member state representatives in Brussels first consult with their national capitals and domestic constituencies to form at least a tentative initial position before consulting with representatives from other member states.[18] Given the structure of the data we observe, we believe this assumption is defendable. The networks we observe are stable across policy areas and over time. By contrast, there is considerable variation in actors' initial positions.[19] Member states that agree on one issue may disagree on another issue, even when the two issues are part of the same legislative proposal. To the extent that our assumption is incorrect, and networks do influence actors' initial positions, our analyses underestimate the true policy impact of the networks. Also in this respect, therefore, the network model faces a tough test in this study.

The following sub-section gives a simple formalization of the network model. This clarifies the assumptions that we make in this study. The sub-section thereafter identifies the intuitively obvious baseline model with which to compare the network model; that is the Nash Bargaining Solution that does not incorporate network relations.

Formalization of the Network Model

The network model assumes that controversial issues can be represented as one-dimensional policy scales on which actors take policy positions. Empirically, as will be discussed below, complex decisions can be represented as sets of related one-dimensional policy scales. Each policy scale refers to a range of policy alternatives.

[18] Hayes-Renshaw and Wallace 2006, Chapter 9.

[19] AUTHOR.

The most extreme policy alternatives considered in a controversy are represented by the numbers 0 and 100, while intermediate policy alternatives are given numbers between 0 and 100 to represent their relative political distance to these extremes. As such, each policy scale represents the range of the bargaining space for each controversy. Actors, from the set of *n* actors, can be placed on each of these policy scales to represent the position they favor most at the outset of the negotiations. If there are *n* actors, let the decision outcome *initially* favored by actor *i* on issue *a* be denoted as $position_{ia\text{-}t1}$.

Consider the position of actor *j* on issue *a after* the influence of the network in which actor *j* is embedded. The revised position of actor *j* (from the set of *n* actors), denoted $position_{ja\text{-}t2}$, is given by the following formula.

$$position_{ja\text{-}t2} = \frac{\sum_{i=1}^{n} position_{ia-t1} network_{ij} salience_{ia}}{\sum_{i=1}^{n} network_{ij} salience_{ia}}$$

Where

$position_{ia\text{-}t1}$ is the position of actor *i* (from the set of actors, *n*) on issue *a* at time *t1* (that is, before the influence stage) on the policy scale representing issue *a*.

$network_{ij}$ is a dichotomous variable which indicates the presence of a network influence relation from actor *i* to actor *j*.

$salience_{ia}$ is the level of salience actor *i* attaches to issue *a*.

Network relations are conceived of as asymmetrical. It is possible that a first actor has access to and therefore influences a second actor while the second actor does not have access to the first actor. This is a common assumption in other network

models. The network model also contains an assumption about the extent to which an actor's own initial position influences its revised position. In other words, how much control does an actor have over itself? The model assumes that each actor has full access to itself, and sets the value of $network_{ii}$ to 1. An alternative, offered by Stokman and Van den Bos, is to calculate the amount of control an actor has over itself based on the power resources an actor has at its disposal relative to the power resources of other actors.[20] Our solution is a simpler one, and avoids introducing additional information on actors' capabilities into the influence part of the model.

The fact that the network model does not feature actors' capabilities is appropriate since actors' capabilities are likely to influence the presence of network relations through which they may influence other actors. In other words, actors are likely to grant access to other actors that have high levels of capabilities. In this respect, information on actors' capabilities features in the model indirectly, through the impact that actors' capabilities have on their network relations. This is reflected in the network data from the EU that we use. Larger member states tend to have better access to other states than do smaller states, although there is also considerable variation that is not associated with size.

Issue salience is an important feature of the influence stage in the network model. A first actor is more influenced by a second actor with which it has an influence relation if that second actor attaches more salience to the issue in question. Issue salience refers to the intensity of actors' policy preferences, a concept with a long pedigree in empirical political analysis.[21] A high level of salience is what turns a potential to influence into actual influence, because an actor with a high level of

[20] Stokman and Van den Bos 1992, 231.

[21] Achen 2006a, 92.

salience will put its capabilities into effect in pursuit of its policy position. Salience, as detailed in the research design section, is measured on a scale from 0-100. A value of 0 indicates that the actor attaches no importance whatsoever to the issue. A value of 100 indicates that the actor will use its full potential to influence the positions of other actors and the decision outcome. Issue salience also implies linkages between different issues. The level of salience an actor attaches to an issue is gauged by the importance of other issues that are under negotiation in the same arena.

The network model described here is a general model that could be applied to any political system. We will detail its specific application to the European Union in the next section. However, we note here that in our application of the model to the EU, we focus exclusively on the network relations among member state representatives in the Council of Ministers. We do not consider the relations involving the European Commission and the European Parliament or actors within those organizations. For the purposes of our model, the network relations involving the Commission and the EP have values of 0.

The second stage of the network model consists of the transformation of the revised policy positions into a decision outcome. The formula that predicts the decision outcome on issue *a* is:

$$\textit{network model decision outcome}_a = \frac{\sum_{i=1}^{n} position_{ia-t2} capabilities_{ia} salience_{ia}}{\sum_{i=1}^{n} capabilities_{ia} salience_{ia}}$$

Where

$\textit{network model decision outcome}_a$ is the network model's prediction of the decision outcome on issue *a*.

$position_{ia\text{-}t2}$ is the position of actor *i* (from the set of actors, *n*) on issue *a* at time *t2* (that is, after the influence stage), as predicted by the network model.

$capabilities_{ia}$ denotes the capabilities of actor *i* on issue *a*.

$salience_{ia}$ is the level of salience actor *i* attaches to issue *a*.

The network model's prediction of the decision outcome, therefore, incorporates its predictions of shifts in actors' positions. The prediction is simply the weighted average of the actors' revised positions. The weights assigned to actors' positions are the products of actors' capabilities times the levels of salience they attach to an issue. As will be discussed in the following section, this is the compromise model or Nash Bargaining Solution applied to the revised positions, as predicted by the network model.

Actors' capabilities are introduced into the network model during the decision stage, when they transform their revised positions into a decision outcome. Capabilities define actors' potential to influence the contents of decision outcomes. Capabilities depend on the possession of a range of resources that could bolster influence.[22] In the decision stage, actors' formal weights in the final decision-making process are important and loom larger than during the influence stage. Consequently, as will be discussed below, we operationalize actors' capabilities using an adjusted measure of actors' voting power. Since voting power varies according to the procedure that applies to the decision, an actor's voting power varies across issues. At the decision stage, whether or not a member state decides to exert its potential to influence depends on how salient the issue is to it. Therefore, issue salience also features in the decision stage of the network model.

[22] Bueno de Mesquita 2003, chapter 7.

The Baseline Model

The compromise model or Nash Bargaining Solution (NBS) is an appropriate baseline model against which to test the accuracy of the network model's predictions of decision outcomes. As a formula the NBS prediction of the decision outcome is:

$$Nash\ decision\ outcome_a = \frac{\sum_{i=1}^{n} position_{ia-t1} capabilities_{ia} salience_{ia}}{\sum_{i=1}^{n} capabilities_{ia} salience_{ia}}$$

Where

$Nash\ outcome_a$ is the compromise model/NBS' prediction of the decision outcome on issue a.

$position_{ia\text{-}t1}$ is the position of actor i (from the set of actors, n) on issue a at time $t1$ (that is, before the influence stage).

$capabilities_{ia}$ and $salience_{ia}$ are defined as above.

The compromise model was first proposed in this form by Van den Bos in his study of decision making in the Council of the European Community. When describing the decision-making process this model represents, he emphasized that it 'takes all positions of Member States into account, weighting these by the resources a Member State can apply during the negotiation and the importance each attaches to the decision at hand'.[23] The compromise model is not concerned with the composition of actors' capabilities. That is exogenous to the model. Rather, it is concerned with

[23] Van den Bos 1991, 176.

the transformation of actors' positions into decision outcomes, and how the relative capabilities and levels of issue salience affect this transformation.

Achen improved the theoretical standing of the compromise model by drawing parallels between this model and the research traditions of institutional realism in political science and social action theory in sociology. He concluded that '[t]his sophisticatedly simple equation neatly summarises much of the previous century's thought about political policy-making'.[24] Moreover, Achen proved that if a certain condition is met, the compromise model is a first-order approximation of the famous Nash Bargaining Solution.[25] Nash formulated the bargaining solution as an answer to the question of what each actor should get in a situation where they must collaborate for mutual benefit. Informally, the essence of Nash's answer is that it is the decision outcome that minimizes the utility losses of the actors involved. Achen's insight is that if the disagreement outcome is highly undesirable, the compromise model and the Nash Bargaining Solution are one and the same.

It is clear that the disagreement outcome is generally highly undesirable in EU decision making, and therefore that the compromise model is an appropriate formula with which to represent the Nash Bargaining Solution in this context. Close observers of decision making in the EU know that negotiators go to great lengths to avoid breakdown in discussions, even when parts of the legislative proposal are unpopular. Hayes-Renshaw and Wallace refer to this as the imperative of making propositions 'yesable'.[26] It is true that on certain controversial issues, including those studied in the dataset examined here, there are often member state representatives who would prefer

[24] Achen 2006a, 94.

[25] Nash 1950.

[26] Hayes-Renshaw and Wallace 2006, 303.

the so-called 'reference point'. The reference point is the decision outcome that would prevail if no decision were taken. However, this reference point does not capture two very important negative consequences of a failure to agree. The first is that other, perhaps uncontroversial parts of the legislative proposal would be lost if no agreement were reached. The second is that breakdowns in the decision-making process are damaging to the long-term relationships among decision makers, a cost that is not worth bearing unless the stakes are extremely high.

In addition to having strong theoretical foundations, the compromise model or Nash Bargaining Solution has an impressive track record in predicting decision outcomes more accurately than supposedly more sophisticated models. The compromise model was tested against a range of rational choice institutionalist models of legislative decision making.[27] None of the more complex models generated more accurate predictions than the compromise model, and most generated significantly less accurate predictions. In addition, Moravcsik suggests that landmark decisions in course of European integration can be understood using the framework of the Nash Bargaining Solution.[28] In short, for theoretical and empirical reasons, the Nash Bargaining Solution is a formidable baseline model against which to test the predictions of the network model. The main limitation of the compromise model, however, is that although it often succeeds in predicting decision outcomes relatively well, it does not give much insight into the process leading up to those decisions. More sophisticated decision-making models are therefore required to provide more satisfying explanations of decision outcomes. The network model developed here is an attempt to do that.

[27] Bueno de Mesquita and Stokman eds. 1994; Thomson *et al*. eds. 2006.

[28] Moravcsik 1998, 498.

Research Design

The research design brings together two distinct sets of data on decision making in the EU that have previously been analyzed in isolation. The first subsection gives details of the information on the network relations among the member states. The second subsection summarizes the information on controversial issues, actors' initial positions, issue salience and final decision outcomes.

Network Relations

Information on the network relations among member state representatives was obtained through a survey of officials from the representations of all member states.[29] The first set of interviews was held from February to March 2003, which yielded a complete dataset on the network relations in the EU-15. The second set of interviews was held from February to March 2006, which yielded a complete dataset on the network relations in the EU-25. The officials were selected from eleven working groups in the Council of the EU. Officials from higher and lower-level working groups were selected from groups on economic policy, internal market, agriculture, foreign and security policy, environment, and justice and home affairs. In order to facilitate comparisons over time the sample of working groups was kept as similar as possible in 2003 and 2006. Nine of the eleven working groups were the same in both

[29] More details of these data can be found in Naurin 2007; Naurin and Lindahl 2008.

interview rounds.[30] The interviews were conducted by telephone. There was a high response rate in both rounds: 81 percent in 2003 and 84 percent in 2006. In total 130 officials from all EU-15 member states were interviewed in the first round, and 231 officials from all EU-25 member states were interviewed in the second round.

In both surveys, 2003 and 2006, the following question was asked:

Which member states do you most often cooperate with within your working group, in order to develop a common position?

On the basis of respondents' answers to this question, we identify the network relations between member states. In this context, it is preferable to ask respondents with whom they cooperate, rather than by whom they are influenced. The network model is concerned specifically with influence that is exerted through personal contacts. The question posed focuses respondents' attention on direct contacts with people from other member states in their working groups.

[30] The higher level working groups included were Coreper II and Coreper I (the ambassadors and the vice-ambassadors of the member states' permanent representatives in Brussels), the Economic Policy Committee, the Special Committee on Agriculture, the Committee on Enlargement (2003 only) the Political and Security Committee and the Article 36 Committee (the latter dealing with judicial cooperation in the field of criminal matters, police cooperation, organized crime and terrorism, included in 2006 only). In cases a Coreper II or Coreper I ambassador was not available, their assistants were interviewed (who in EU-jargon are called the Antici- and Mertens-delegates respectively). The lower level working groups were the Politico-Military Working Party, the Working Party on Mashrek-Maghreb (2003 only), the Working Party on Agricultural Questions, the Working Party on the Environment, the Working Party on Tax Questions and the Working Party on Competition and Growth (2006 only).

In answer to this question, respondents listed the member states they cooperated with most often. In the present study, we assume that an ego member state is influenced by an alter member state if at least one official from the ego state mentions the alter state as a cooperation partner. Naurin and Lindahl formulate a weighted measure of the strength of the network ties based on the order in which officials list other member states averaged across respondents.[31] The dichotomous measure applied in the present study is simpler in that it does not involve an assumption about the association between the order of respondents' answers and the strength of their network relations. To test the robustness of the results, we also ran the analyses with this weighted measure and with an unweighted measure averaged across respondents.

There is a broad tendency for member states to cooperate more closely with states that are geographically close to them, a pattern which is familiar from studies of coalition-building in the Council based on voting records and data on policy positions.[32] Prior to the enlargement in 2004 the network relations in the Council working groups found in the data used here were structured primarily by a North-South dimension. After the enlargement the North-South dimension was complemented by an East-West dimension. The geographical patterns are remarkably stable across policy areas (comparing foreign and security policy, agriculture and economic policy), Council hierarchy levels and over time. Larger states tend to have more network capital, i.e. access to more other states, than smaller states, although the correlation is weak.[33]

[31] Naurin and Lindahl 2008.

[32] Mattila 2008; AUTHOR.

[33] Naurin and Lindahl 2008.

Policy positions, salience, capabilities and decision outcomes

The data we use on actors' initial policy positions, issue salience and decision outcomes are drawn from two studies. The first study gathered data on decision making in the EU-15.[34] The second study applied a similar research design to gather data on decision making in the post-2004 EU. Both studies offer the same type of comparable and detailed information on controversial issues raised by legislative proposals. We match the network data to the relevant time period.

As suggested in the formulation of the network model, we conceive of political disagreement in terms of the distances between actors in policy spaces. Controversies raised by legislative proposals are conceptualized as issue continua or policy scales. The legislative proposal on payment services is one of the proposals examined in this study, on which five semi-structured interviews were held.[35] The main issue raised by this proposal was the extent to which the huge market for providing payment services should be opened up to businesses other than banks. There was a fundamental disagreement, depicted in Figure 1, about the capital requirements, if any, that companies should have to fulfill in order to be allowed to provide payment services. At the left end of the issue continuum (position 0) we find the most liberal position, taken by the Commission and a group of member states led informally by the UK. These actors favored few restrictions on market entry. At the

[34] Thomson *et al*. eds. 2006.

[35] This proposal became Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC.

right end of the continuum (position 100), we find a group of states led informally by Germany, that favored tight restrictions on market entry in the form of high capital requirements. Intermediate positions are placed on positions between these two alternatives on a scale of 0-100, to reflect key informants' judgments on the political distances between the alternatives. One such position was a compromise proposal, suggested by the Finnish delegation when it held the presidency. This compromise was judged to be half-way between the two opposing camps and placed on position 50. The final outcome contained lower capital requirements than the Finnish proposal and is therefore somewhat closer to the Commission and UK's position (position 40). This method of representing controversies spatially has been applied in a range of studies of decision making in national and international politics.[36]

<FIGURE 1>

The selection consists of 93 legislative proposals, 89 of which have been decided on and can therefore be included in the present study (Table 1). 70 of the proposals are from the EU-15 period and 23 from the post-2004 period. Legislative proposals introduced by the Commission were selected for study according to three criteria: the time period, the type of legislative procedure and the level of political importance. Regarding the time period, each legislative proposal was on the Council's agenda in the years 1999, 2000 or after the 2004 enlargement. Legislative proposals introduced up to December 2005 were included. Concerning the decision-making

[36] See, for example, Bueno de Mesquita 2003; Bueno de Mesquita and Stokman eds. 1994. Full details of the research design decisions for the EU-15 study can be found in Thomson and Stokman 2006.

procedure, the selected legislative proposals were subject to either the consultation or the codecision procedures, the two most commonly-used procedures. Regarding political importance, the selection was restricted to proposals on which there was an indication of at least some political importance and controversy. Each proposal was mentioned in news services covering European affairs: *Agence Europe* in the EU-15 period or *Agence Europe* and *European Voice* in the post-2004 period. Furthermore, key informants had to identify at least one substantive disagreement between at least some of the actors. We included directives, regulations and decisions in the EU-15 study, but excluded decisions from the post-2004 study. The effect of changing the new services and instruments in the post-2004 study was to focus the selection on more high-profile proposals. In the EU-15 study, we found that many of the proposals we had initially selected were highly technical and not controversial at all. The policy areas represented most prominently in the selection of EU-15 proposals are agriculture and internal market, each with 14 proposals, although fisheries (7 proposals) and other policy areas are also present. Compared to the EU-15 study, the selection of proposals for the post-2004 study is more evenly distributed across different policy areas, including agriculture (five proposals), fisheries (three proposals), employment (two proposals), and environment (three proposals).[37] As

[37] The 23 proposals included in the post-2004 study are sugar sector reform (CNS/2005/118), animal welfare (CNS/2005/009), agricultural fund (CNS/2004/161), CAP financing (CNS/2004/164), fisheries fund (CNS/2004/169), hake fish conservation (CNS/2003/318), conservation of fish in Biscay area (CNS/2003/327), the Regional Development Fund (COD/2004/167), including the general regulation of the Regional Development Fund (AVC/2004/163) also dealt with in the same codecision package, the working time directive (COD/2004/209), LIFE environmental programme (COD/2004/218), the European

reported in Table 1, we identified decision outcomes for almost all of the issues raised in the EU-15 selection, and for 57 of the 70 issues raised by the post-2004 proposals. The remaining issues from the post-2004 study are still pending.

<TABLE 1>

Information on controversial issues and actors' initial positions on these issues was collected in 263 semi-structured interviews with key informants (125 key informants in the EU-15 study and 138 informants in the post-2004 study). These interviews typically lasted between 60 and 90 minutes. The key informants were selected for their knowledge of the detail of the dossiers under investigation. Usually they were participants. We require detailed information on actors' positions. This means our sources have to be close to the discussions. Individuals with different institutional affiliations were interviewed. The Commission officials interviewed (31 in the EU-15 study and 17 in the post-2004 study) were usually responsible for drafting the proposals and monitoring the subsequent discussions. The officials from the permanent representations (69 in the EU-15 study and 80 in the post-2004 study) were usually the responsible desk officers. The individuals from the EP (4 in the EU-

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Neighbourhood Instrument (COD/2004/219), port services (COD/2004/240), passengers with reduced mobility (COD/2005/007), data retention (COD/2005/182), waste (COD/2005/281), spirits (COD/2005/028), intellectual property rights (COD/2005/127), air pollution (COD/2005/183),pensions (COD/2005/214), broadcasting (COD/2005/260), payment services (COD/2005/245), Visa information system (COD/2004/287).

15 study and 41 in the post-2004 study) were either MEPs or their assistants.[38] A further nine officials from the Council secretariat and twelve from interest groups were interviewed in the EU-15 study.

During these semi-structured interviews, each of the controversial issues was represented spatially, in the form of a policy scale ranging from 0 to 100 that represents the range of the bargaining space. Informants were free to specify as many issues they felt appropriate. However, usually two or three issues were sufficient to represent the controversies raised by a proposal. The informants' estimates of the actors' positions refer to the decision outcomes favored most by each of the actors at the time of the introduction of the Commission's legislative proposal, or as soon as they took a position thereafter. The informants were also asked to estimate the level of importance each of the actors attached to each issue. This level of importance was estimated on a scale of 0-100, whereby a score of zero indicates that the issue was of no importance whatsoever, 50 that it had an 'average' level of importance to the actor concerned, and 100 that the issue could hardly be more important. The relations between the salience scores for different actors are more important than the absolute values of the scores. As with the procedures for estimating actors' positions on controversial issues, the procedure for estimating issue salience was adapted from a widely-used procedure for decision analysis.[39] When obtaining the judgments on actors' positions and the levels of importance they attached to the issues, they were asked to substantiate their judgments extensively.

[38] A larger number of informants from the EP were interviewed in the post-2004 study. This was necessary because part of that study, that will be reported on elsewhere, examines the positions taken by actors within the EP.

[39] Bueno de Mesquita 2003, 598-602.

Validity and reliability tests were conducted on the informants' judgments. These tests consisted of comparing informants' judgments with information from Council and EP documentation, and comparing judgments from different informants.[40] These tests show that of all the points of discussion raised in the Council, key informants generally focus on issues that are more controversial, and that are more difficult to resolve. Informants' estimates of the positions actors favored usually match information reported in Council documentation. When they differ, these differences are due to the fact that Council documents do not refer to policy preferences, but to the decision outcomes actors were prepared to accept during the course of the negotiations. In addition, König *et al*. compared 31 point estimates provided by key informants from the Council with estimates from informants in the European Parliament and found that 30 match perfectly or almost perfectly.[41]

Recall that the decision stage of the network model also incorporates actors' capabilities when transforming their revised positions into the decision outcome. We posit that while the informal network relations are important during the influence stage, actors' formal weights in the decision-making process are paramount at the final decision stage. We therefore apply a commonly used voting power index, the Banzhaf index.[42] Given that this voting power index is based on actors' formal

[40] Thomson 2006.

[41] König *et al*. 2007.

[42] Banzhaf 1965. Calculated using the voting power index calculator, Powerslave: Pajala, Meskanen and Kause 2002. Winning coalitions under the consultation procedure with QMV in the Council are assumed to consist of both a qualified majority of member states in the Council of ministers and the Commission or a unanimous Council: {CM(QMV), COM}, {CM(Unan.)}. Under consultation unanimity, winning coalitions consist of a unanimous

weights in the decision process, it attributes equal weight to the member states when the unanimity rule applies and weights that are roughly proportional to their qualified majority votes (QMV), when the QMV rule applies. The Commission also receives a positive voting power score when the consultation procedure applies combined with QMV in the Council. The European Parliament receives a positive voting power score when the co-decision rule applies.

Analysis

In the example of the controversy relating to the payment services directive illustrated in Figure 1 the network model generates a somewhat more accurate prediction of the actual decision outcome than does the baseline Nash Bargaining Solution (NBS). According to the network model, the states that were calling for strong regulation of the payment services market moderated their positions as a consequence of their network ties with states that had more liberal positions. The states with liberal positions also shifted their positions according to the network model, but less than the states that wanted more regulation. On the basis of these revised positions, the

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Council only: {CM(Unan.)}. Under the codecision procedure with QMV in the Council, winning coalitions consist of both a qualified majority of member states in the Council of ministers and the European Parliament: {CM(QMV), EP}. Under codecision with unanimity in the Council, winning coalitions consist of a unanimous council and the EP: {CM(Unan.), EP}. The Bahnzhaf index gives lower power scores to the supranational institutions than the Shapley-Shubik Index (SSI; Shapley and Shubik 1954) using the same assumptions about winning coalitions (AUTHOR). These lower power scores are more appropriate given the prevailing inter-institutional power distribution in the EU (AUTHOR).

network model predicted that position 56 on the scale (rounded to the nearest whole number) would be the decision outcome, which is 16 points to the right of the actual outcome. On the basis of actors' initial positions, the baseline NBS generates a prediction of point 61 on the scale, which gives it an absolute error of 21 scale points from the actual outcome.

The difference between the predictions made by the network model and the baseline NBS are not large, but it is statistically significant. This means that we may be able to identify which one is closest to the decision outcome, if indeed there is a systematic pattern in this regard. On average, the distance between the point predictions of the two models is 2.46 scale points (s.d.: 2.41; n=230). The 95 percent confidence interval for the mean difference between the point predictions of the two models ranges from 2.17 to 2.78.

The similarity between the predictions of the network model and the baseline NBS model is unsurprising given that the models have quite similar structures. The network model is in effect a variant of the NBS that incorporates the network structure among the member states. The advantage of this similarity is that any differences in model performance can be attributed to the inclusion of the network structure, rather than any other differences between the two models.

An appropriate procedure for testing the accuracy of model predictions is to examine the absolute distance between the point prediction of each model on each issue and the actual decision outcome.[43] Table 2 contains information on the accuracy of the predictions of decision outcomes of both the network model and the baseline Nash Bargaining Solution (NBS). The top right of this table shows that across all of the issues on which we currently have data on decision outcomes (230 controversial

[43] Achen 2006b.

issues), the network model has a mean average absolute error of 22.10 policy scale points. This is fractionally smaller than the mean error of the NBS at 22.81. The difference between these errors is however highly statistically significant as indicated by the non-parametric Wilcoxon test. The error of the network model is smaller than that of the NBS in 119 of the 215 issues. The error of the NBS is smaller than that of the network model in 86 of the issues, and the two models tie in 25 cases. Therefore, despite the similarity in the two models' predictions, the network model's predictions are consistently closer to the outcome than are the NBS's predictions.

<TABLE 2>

Table 2 also contains information on the differences between the models by different policy areas, decision procedures, and time periods. In general, the network model's predictions are more accurate than those of the NBS in each sub-group of issues. We find the opposite pattern, whereby the average errors of the NBS are smaller than the errors of the network model, in only the 25 fisheries issues. However, in these 25 issues the errors of the network model are more frequently smaller than those of the NBS, as indicated by the negative z-scores.[44]

[44] We tested the robustness of the results by applying other versions of the network measure, weighted and averaged across respondents. With these alternative measures, the network model predicts smaller position shifts than with the dichotomous measure. Consequently, with these alternative measures the network model's predictions of decision outcomes differ less from those of the baseline compromise model (NBS). Regardless of which measure that is

If we compare the sub-groups of issues in Table 2, we find that the network model's predictions are significantly more accurate than those of the baseline model when we have a relatively large number of observations with which to detect these differences. In each of the three largest sub-groups of issues, the tests indicate that the network model significantly improves on the predictive accuracy of the NBS: the 93 issues in the 'other' policy areas category, the 83 issues subject to codecision and QMV in the Council, and the 173 issues from the EU-15 study. The simplest explanation for finding significant differences in these sub-groups of cases is that there is more statistical power with which to detect such differences.[45] The 'other' policy area category consists of a large number of policy areas, each of which contains a small number of observations, including environment, health, culture, transport and education. Given the similar structures of the network model and the baseline model, and consequently their similar predictions, we need a substantial number of cases to detect significant differences in their predictive accuracy.

Conclusions

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used, however, the network model's predictions are always more often closer to the actual outcomes than are the baseline model's predictions, indicated by the negative z-scores in all the tests.

[45] Table 2 contains 12 bivariate tests, five of which are statistically significant at the $p<.05$ level. Arguably, one would expect to find a statistically significant difference between two groups in a sample at the $p<.05$ level in one in every twenty tests, even if no difference existed in the population. One Bonferonni correction would multiply the p-values by the number of tests to obtain a more accurate estimation of the probability of a Type I error. If this procedure were applied, then the difference between model performance in all 230 cases would still be significant (p of .003 * 12 = .036).

The network model predicts shifts in actors' policy positions as a consequence of the relationships in which they are embedded. In our application of this model to decision making in the European Union, state representatives shift their policy positions due to the influence exerted on them by other states with which they have network ties. Our main finding is that the network model generates significantly more accurate predictions of decision outcomes than does the baseline Nash Bargaining Solution. This baseline model has a formidable track record in predicting the outcomes of decision making in the EU, as evident in previous studies in which its predictive power was compared to that of more complex models. Consequently, our main finding is striking evidence of the importance of taking network relations into account when formulating models of decision making in international politics.

Our test of the impact of network relations was a particularly tough one because our model does not allow these relations to influence actors' initial policy positions. The network model assumes that states' initial policy positions are formulated prior to their contacts with other states. According to the network model, states' network ties influence the development of these initial positions before the formal decision stage. Previous qualitative research on how state representatives formulate their initial policy positions in the EU suggests that this is a defendable assumption. Nonetheless, it is certainly a simplification, and future research may be directed toward the investigation of how networks affect the formation of states' initial policy positions, as well as their policy positions after negotiations.

The findings add nuance to our understanding of the process of decision making in the EU. Decision making in the EU is certainly inclusive in the sense that the positions of all actors appear to be reflected in decision outcomes to some extent.

Previous research has shown that models that incorporate information on the policy positions of all actors, such as the baseline NBS applied here, generate relatively accurate predictions of decision outcomes. By contrast, models that incorporate information on the positions of only subsets of actors, such as the positions of the agenda setter and the pivotal actor, generally make less accurate predictions of decision outcomes. While our findings are consistent with this general insight, they indicate that some states' positions matter more than others with respect to the influence they exert on other states through their network relations. This clarifies the nature of the network relations we encounter in the EU. Analysts of some other political systems have observed that policy networks may be used to alert like-minded actors of the need to take action on an issue, rather than to change the policy positions of other actors. While networks in the EU may also be used for this, the evidence we present suggests that actors use their networks to shift other states' initial policy positions. Consequently, a model that incorporates network relations generates more accurate predictions of decision outcomes.

The resource that actors derive from their network relations has been referred to as their network capital. States differ markedly from each other in terms of their network capital, even in a highly-institutionalized international system such as the EU. In the EU, there is evidence that the network capital empowers some small and medium-sized states to a greater extent than might be expected on the basis of their population sizes or economic resources. While large states do tend to have more network influence over others, the distribution of network capital is not associated with size in a linear fashion. While Germany, the United Kingdom and France have large stocks of network capital, Sweden, the Netherlands and Denmark have more

network capital than do Spain and Italy.[46] Thus, it appears that the distribution of informal power resources is advantageous to at least some small and medium-sized states, and disadvantageous to some large states. To a certain extent, this is consistent with the formal institutions of the EU that feature a degressive proportionality, whereby large states have more weight than small states but not in proportion to the differences among their population sizes.

The present study is one of the first steps toward the systematic incorporation of networks in the study of international politics. The network model proposed here is very similar in structure to the baseline model. This similarity had the advantage of holding constant the basic model structure, thereby enabling us to gauge the effect of including information on networks. Since the results indicate that the inclusion of networks improves the predictive power of the baseline model, future research might incorporate networks into more sophisticated models of decision making. At present, most models of bargaining in international politics, in both the cooperative and non-cooperative traditions, assume at least implicitly that each actor has unfettered access to all other actors. Network analysis can replace this unrealistic assumption with measures of the relationships in which actors are embedded and theories of how these relationships affect their behavior.

[46] Naurin and Lindahl 2008.

References

Achen, Christopher H. 2006a. Institutional realism and bargaining models. In *The European Union Decides*, edited by Robert Thomson, Frans N. Stokman, Christopher H. Achen and Thomas König, 86-123. Cambridge: Cambridge University Press.

Achen, Christopher H. 2006b. Evaluating Political Decision-Making Models. In *The European Union Decides*, edited by Robert Thomson, Frans N. Stokman, Christopher H. Achen and Thomas König, 264-98. Cambridge: Cambridge University Press.

Axelrod, Robert. 1970. *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*. Chicago: Markham.

Banzhaf, John. F. 1965. Weighted Voting Does not Work: A Mathematical Analysis. *Rutgers Law Review* 35: 317-43.

Barry, Brian. 1965. *Political Argument.* Berkeley: University of California Press.

Bentley, Arthur F. 1967[1908]. *The Process of Government*. Cambridge: Harvard University Press.

Brewer, Marilyn B., and Rupert J. Brown. 1998. Intergroup Relations. In *The Handbook of Social Psychology*, 4th ed, edited by Daniel T.Gilbert, Susan T. Fiske and Gardner Lindzey, 554-94. Boston, Mass.: McGraw-Hill.

Bueno de Mesquita, Bruce. 1994. Political Forecasting: An Expected Utility Model. In *European Community Decision Making. Models, Comparisons, and Applications*, edited by Bruce Bueno de Mesquita and Frans N. Stokman, 71-104. New Haven: Yale University Press.

Bueno de Mesquita, Bruce. 2003. *Principles of international politics: People's power, preferences and perceptions*. 2nd edition. Washington DC: CQ Press.

Bueno de Mesquita, Bruce and Frans N. Stokman. Eds. 1994. *European Community Decision-making: Models Applications and Comparisons*. New Haven: Yale University Press.

Carrington, Peter J., John Scott, and Stanley Wasserman. Eds. 2005. *Models and Methods in Social Network* Analysis. Cambridge: Cambridge University Press.

Coleman, James. 1990. *Foundations of Social Theory*. Cambridge, MA.: The Belknap Press of Harvard University.

Gutmann, Amy and Thompson Dennis F. 1996. *Democracy and* Disagreement. Cambridge, Mass.: The Belknap Press of Harvard University Press.

Hafner-Burton, Emilie M., Miles Kahler, and Alexander H. Montgomery. Forthcoming. Network Analysis for International Relations. *International Organization*.

Hagemann, Sarah. 2008. Voting, Statements and Coalition-Building in the Council. Party Politics and National Interest. In *Unveiling the Council of the European Union. Games Governments Play in Brussels*, edited by Daniel Naurin and Helen Wallace, 36-63. Basingstoke: Palgrave Macmillan.

Heinz, John P., Edward O. Laumann, Robert L. Nelson, and Robert H. Salisbury. 1993. *The Hollow Core: Private Interests in National Policy Making*. Cambridge: Harvard University Press.

Hayes-Renshaw, F., W. Van Aken, H. Wallace. 2006. When and why the EU Council of Ministers votes explicitly. *Journal of Common Market Studies*, 44(1): 161-94.

Jones, Bryan D. 2001. *Politics and the Architecture of Choice: Bounded Rationality and Governance.* Chicago: University of Chicago Press.

Knoke, David, Franz Urban Pappi, Jeffrey Broadbent and Yataka Tsujinaka. 1996. *Comparing Policy Networks: Labor Politics in Germany, Japan and the United States*. New York: Cambridge University Press.

Kollman, Ken. 1998. *Outside Lobbying: Public Opinion and Interest Group Strategies*. Princeton: Princeton University Press.

König, Thomas, Bjorn Hörl, Sandra Lechner, and Winfried Pohlmeier. 2007. Bicameral conflict resolution in the European Union: An empirical analysis of Conciliation Committee bargains. *British Journal of Political Science* 37: 281-312.

Laumann, Edward O., and David Knoke. 1987. *The Organizational State: Social Choice in National Policy Domains*. Madison: The University of Wisconsin Press.

Mattila, Mikko. 2004. Contested decisions: Empirical analysis of voting in the European Union Council of Ministers. *European Journal of Political Research*, 43: 29-50.

Mattila, Mikko. 2008. Voting and Coalitions in the Council after Enlargement. In *Unveiling the Council of the European Union: Games Governments Play in Brussels*, edited by Daniel Naurin and Helen Wallace, 23-35. Basingstoke: Palgrave Macmillan.

Moravcsik, Andrew. 1998. *The Choice for Europe*. Ithaca: Cornell University Press.

Nash, John F. 1950. The bargaining problem. *Econometrica* 18 (2): 155-62.

Naurin, Daniel. 2007. Network Capital and Cooperation Patterns in the Working Groups of the Council of the EU. *EUI Working Papers RSCAS* 2007/14.

Naurin, Daniel and Lindahl, Rutger. 2008. East-North-South: Coalition-building in the Council before and after enlargement. In *Unveiling the Council of the European*

Union: Games Governments Play in Brussels, edited by Daniel Naurin and Helen Wallace, 66-78. Basingstoke: Palgrave Macmillan.

Pajala, Antti, Tommi Meskanen and Tomi Kause. 2002. Powerslave Power Index Calculator: A Voting Body Analyser in the Voting Power and Power Index Website. University of Turku (Published 22.4.2002, updated 31.5.2007), <URL:http://powerslave.val.utu.fi/>.

Risse, Thomas. 2000. "Let's argue!": communicative action in world politics. *International Organization* 54 (1):1-39.

Schimmelfennig, Frank. 2001. The Community Trap: Liberal Norms, Rhetorical Action, and the Eastern Enlargement of the European Union. *International Organization* 55(1): 47–80.

Shapley, L.S. and M. Shubik. 1954. A Method for Evaluating the Distribution of Power in a Committee System. *American Political Science Review* 48: 787-792.

Stokman, Frans N. and Jaco Berveling. 1998. Dynamic Modeling of Policy Networks in Amsterdam. *Journal of Theoretical Politics* 10(4): 577-601.

Stokman, Frans N. and Jan M.M. Van den Bos. 1992. A two-stage model of policy-making with an empirical test in the US energy-policy domain. In *The Political Consequences of Social Networks*, edited by G. Moore and J. Allen Whitt, 219-53. Greenwich: JAI Press.

Stokman, Frans N., and Reinier Van Oosten. 1994. The Exchange of Voting Positions: An Object-Oriented Model of Policy Networks. In *European Community Decision Making. Models, Comparisons, and Applications*, edited by Bruce Bueno de Mesquita and Frans N. Stokman, 105-27. New Haven: Yale University Press.

Stokman, Frans N., and Evelien P.H. Zeggelink. 1996. Is Politics Power or Policy Driven? A Comparative Analysis of Dynamic Access Models in Policy Networks. *Journal of Mathematical Sociology* 21: 77-111

Thatcher, Mark. 1998. The Development of Policy Network Analysis: From Modest Origins to Overarching Frameworks. *Journal of Theoretical Politics* 10: 389–416.

Thomson, Robert. 2006. Comparison of expert judgments with each other and with information from Council documentation. In *The European Union Decides*, edited by Robert Thomson, Frans N. Stokman, Christopher H. Achen and Thomas König, 329-47. Cambridge: Cambridge University Press.

Thomson, Robert, Frans N. Stokman, Christopher H. Achen, and Thomas König. Eds. 2006. *The European Union Decides*. Cambridge: Cambridge University Press.

Tsebelis, George and Geoffrey Garrett. 2000. Legislative politics in the EU. E*uropean Union Politics*, 1: 9–36.

Van Deemen, Adrian. 1997. *Coalition Formation and Social Choice*. Amsterdam: Kluwer.

Van den Bos, Jan M.M. 1991. *Dutch EC Policy Making: A Model Guided Approach to Coordination and Negotiation.* Amsterdam: Thesis Publishers.

Wasserman, Stanley and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.

Tables and figures

Table 1. Distribution of selected proposals (in parentheses are the numbers of cases with decision outcomes)

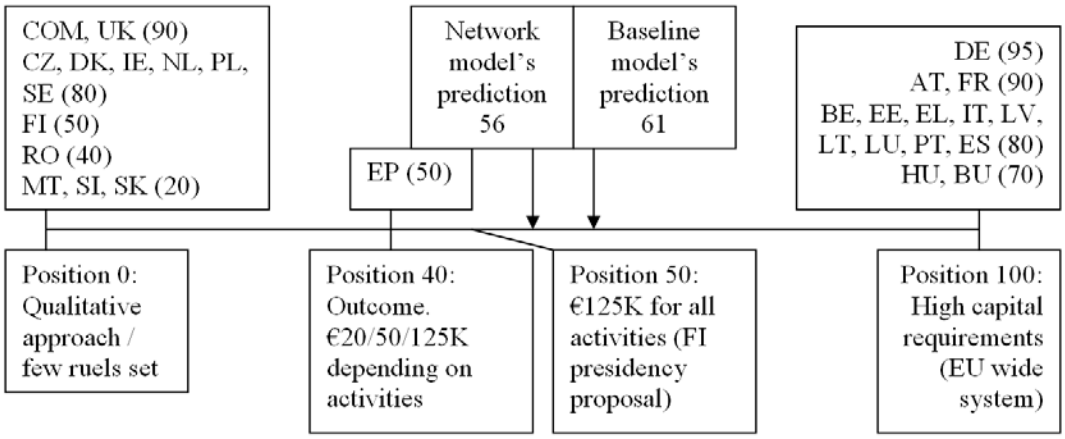
Study	EP involvement	Council voting rule	Legislative proposals selected by researchers	Issues identified by experts	Type of instrument	Legislative proposals	Issues
EU-15	COD	QMV	23 (23)	63 (62)			
		Unan.	5 (5)	12 (12)	Directives	30 (30)	78 (77)
	CNS	QMV[a]	22 (22)	55 (55)	Regulations	33 (33)	79 (79)
		Unan.	20 (20)	44 (44)	Decisions	7 (7)	17 (17)
Total			70 (70)	174 (173)		70 (70)	174 (173)
Post-2004 EU	COD	QMV	12 (9)	30 (21)			
		Unan.	4 (3)	16 (12)	Directives	10 (6)	32 (19)
	CNS	QMV	6 (6)	20 (20)	Regulations	13 (13)	38 (38)
		Unan.	1 (1)	4 (4)	Decisions	-	-
Total			23 (19)	70 (57)		23 (19)	70 (57)

Note: COD: codecision; CNS: consultation. a: contains one legislative proposal with two issues (CNS/1999/192 on the Employment Committee) that required the support of a QMV and ten member states to pass.

Table 2. Errors of network model compared to baseline Nash Bargaining Solution under different conditions

	Policy areas					
	Agriculture (n = 52)	Fisheries (n=25)	Internal Market (n=37)	Justice and Home Affairs (n=23)	Other (n=93)	All (n=230)
Network model	25.39 (21.06)	18.66 (14.74)	27.31 (18.93)	23.72 (26.25)	18.71 (17.84)	22.10 (19.62)
NBS baseline	25.99 (21.70)	18.45 (14.42)	28.27 (20.05)	23.98 (26.58)	19.73 (18.53)	22.81 (20.22)
z-score	-1.10	-0.60	-1.33	-0.45	-3.08***	-3.00***
	Decision procedures					
	Consultation QMV (n=75)	Consultation unanimity (n=48)	Co-decision QMV (n=83)	Co-decision unanimity (n=24)		
Network model	23.36 (19.92)	17.78 (19.70)	22.72 (19.10)	24.67 (20.29)		
NBS baseline	23.66 (20.39)	18.72 (19.72)	23.71 (20.35)	25.20 (20.38)		
z-score	-0.89	-1.77*	-2.28**	-.82		
	Before/after 2004 enlargement					
	Before (n=173)	After (n=57)				
Network model	22.66 (20.33)	20.41 (17.35)				
NBS baseline	23.49 (21.07)	20.72 (17.39)				
z-score	-2.79***	-1.06				

Note: Standard deviations in parentheses. Negative z-scores from Wilcoxon signed ranks test indicate that errors of the network model are more often lower than errors of the NBS baseline than *vice versa*. *p≤0.10, **p≤0.05, ***p≤0.01 (two-tailed).



What capital requirements, if any, should be set for companies that provide payment services?

Figure 1. Initial Positions of the Actors on Payment Services Controversy