

Núm. 45 / Abril 2006

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Editat per l'Institut Universitari d'Estudis Europeus

Imprès per Grup Artyplan – Artymprès, S.A.

ISBN – 84-95201-17-8
Dipòsit legal: B-24.580-2006

Imprès a Catalunya

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1. Introduction

According to the account of European Union (EU) decision making proposed in this paper, this is a bargaining process during which actors shift their policy positions with a view to reaching agreements on controversial issues. The observation that actors shift their positions, and cajole or compel others to shift theirs, is central to our conception of political bargaining. Practitioners of European affairs reported that flexibility in the actors' initial policy positions is an important feature of the decision-making process. For example, during one interview an informant was asked why the actors were so polarised in terms of the policy alternatives they 'favoured most' at the outset of the discussions. He responded: 'That's not so unusual. At the start of the negotiations, the positions tend to be more extreme. As the discussions get under way, we realise what is politically feasible, and converge gradually toward those points'¹. In this paper, we compare two main models of the bargaining process that leads to shifts in actors' initially most favoured positions. The main goal is to evaluate the predictive and explanatory value of two alternative models and the mechanisms they portray. Each of the models analysed in this research represents a bargaining mechanism intended to direct the bargaining and policy outcomes observed during the EU decision process. The processes simulated by these models help us to understand the types of processes that actually take place during collective decision-making in the EU. The strength of the analysis provided by comparing alternative models rests on the rigorous and systematic evaluations of the political processes and mechanisms they represent. From this perspective, the present analysis goes far beyond any type of anecdotal evidence about the processes examined. Therefore, the main focus of this research concerns the identification of the *mechanisms* that represents the main processes of the decision-making process best in the EU: the way in which actors interact with one another and how their actions are transformed into final collective outcomes.

¹ Interview by Robert Thomson on 26th July, 2000 on the Directive on Council of 23 June 2000 relating to cocoa and chocolate products intended for human consumption.

The models we focus on in this paper are the exchange model (Stokman and Van Oosten 1994) and the challenge model (in other studies this model is also referred to as ‘the expected utility model’; Bueno de Mesquita 1994). These models belong to a class of rational choice models of collective decision-making that distinguish between two stages of the decision-making process. The first is the *influence* stage, and the second is the *final decision* or *voting* stage. During the influence stage, actors attempt to influence each other with a view to realising decision outcomes that are closest to the policy alternatives they favour. The models differ with respect to their propositions about what *influence strategies* actors use in the first stage, and with respect to actors’ expectations and predictions of the final decision outcomes in the second, final decision stage. In the exchange model, for example, effective influence depends on *cooperation* between actors; the challenge model assumes an orientation towards *non-cooperative* behaviour. Although the actors are assumed to be goal oriented, they may not recognise the full implications of the strategies they employ to influence others. For example, the challenge model includes the possibility that while attempting to build an effective coalition around their positions, actors might provoke opposition, as a result of which their positions are weakened, rather than strengthened. Further, in the exchange model actors do not consider the full implications of their influence strategies on other actors, who are not the target of their influence attempts.

Both models portray mechanisms about the object of study, the EU decision making. A mechanism is an unobserved analytical construct that explains observed associations between events. Schelling (1998:32-33) defines a social mechanism as ‘a plausible hypothesis, or set of plausible hypotheses, that could be the explanation of some social phenomena, the explanation being in terms of interactions between individuals, or individuals and some social aggregate’. Thus, mechanisms² are important to the extent they are able to introduce a systematic set of statements that provide a feasible account of, for example, how the EU bargaining and the decision-making processes are linked to one another. The idea of mechanism as intermediaries between laws and descriptions was developed by Merton (1967) when he identified the idea of mechanism with middle-range theory.

² Elster (1998) identifies the antonym of a mechanism as a black box.

The idea of generative political mechanisms (in the EU) is adapted to the theoretical goal of the present research. This is due to the difficulty of generating laws and precise theories with explanatory capabilities in a complex political system such as the EU bargaining and the decision-making process. In this sense, Elster's plea for mechanisms is not an argument against scientific laws or scientific explanations, but 'only against the idea that when such explanations fail - which they usually do - we must fall back on narrative and description' (1998:49). In this line, Boudon adds that understanding is achieved through analytical models, which show the abstract logic of the process being analysed, 'we must go beyond the statistical relationships to explore the generative mechanism responsible for them' (Boudon 1976: 117). Therefore, the search for mechanisms means that we are not satisfied by simply establishing systematic statistical relations between variables. A mechanism-based explanation is not merely an association between variables, but always refers to causes and consequences of individual action.

The approach used as the framework for the present research is mainly concerned with theory-driven and empirical analysis about EU decision making processes and adopts a rational choice approach. Variations in actors' preferences are at the root of policy controversies, and bargaining and negotiation are a consequence of those controversies. EU actors are policy seekers and they participate in the bargaining process in order to reach policy outcomes. Thus, they are sensitive to issues insofar as there is some sort of utility achievable. But at the same time, actors have to take into account institutional constraints (such as rules or procedures) in framing their own plans of action. Thus, it is expected that the final outcome of any specific action is a consequence of the preferences of the actors and of the institutional framework in which those actors operate. Bargaining and decision outcomes in the European Union are assumed to be a consequence of the interactions between interests and policy preferences³ of actors within institutional constraints. As Plott (1991) argues, if preferences change, outcomes can change, even if institutions remain constant ... if institutions change, outcomes can change, even if preferences remain constant.

³ Policy preferences refer to the policy alternative actors wish to achieve. The type of preferences referred to in this research are instrumental preferences that can lead to actors' ultimate policy goals. Note that in the EU context those goals might have an economical, political or ideological content.

Previous applications of the new institutional approach to the EU decision-making have been fruitful. A number of procedural models have been formulated and tested in the EU context. These models place emphasis on the procedural aspects of decision-making literally. They basically focus on the provisions and norms concerning which actors are empowered to make proposals and the thresholds of support required before the adoption of legislative acts. Thus, they examine the relative impact of EU institutional actors, the consequences of the legislative procedures or the decision outcomes of legislative politics. Some examples of this literature are the study of the legislative process and the agenda-setting role of the EP (Tsebelis 1994, 1996, 1997; Tsebelis and Garret 1997; Crombez 1997; Moser 1997; Scully 1997); the utility of power-index analysis for the understanding the influence of different member states in the Council (Garret and Tsebelis 1996) and the analysis focused on the supranational delegation and agency (Dogan 1997; Franchino 2000).

Other types of formal models that have been applied to the EU decision making process are bargaining models. These models were studied in the volume *European Community decision-making*, edited in 1994 by Bruce Bueno de Mesquita and Frans Stokman. Bargaining models, in contrast to procedural models, focus on what happens at the stage before a vote does take place. More specifically, bargaining models include the strategies and modes of interaction actors engage in with the aim of maximizing their influence. The nature of these interactions include exchanges between actors, challenges among actors, the formation of coalitions or the use of different types of arguments. The main consequences of those interactions are shifts in actors' policy positions. The research approach adopted in the present paper is one that was used by Bueno de Mesquita and Stokman (eds., 1994). That research included a careful specification of the models and applied them to five dossiers containing sixteen issues. The challenge model was found to generate the most accurate predictions of the outcomes of Council decision-making. The authors concluded that 'overall, the two best models are the expected utility (or challenge) model and the compromise position exchange model'⁴ (ibid.: 225). It was not, however, possible to distinguish between the alternative models statistically. We aim to do so in the

⁴ In addition to the 16 issues on which most of the models were applied and tested in the 1994 volume, data were also collected on an additional six issues on the creation of the European Central Bank. In a re-analysis of the data and predictions from the 1994 book, Thomson (2000: 8) points out that 'several of the tests, in

present paper. Further, this research also includes the analysis of a much larger number of issues and more actors, including the Commission and the European Parliament.

In the next section, we describe the alternative models used in this study. This also includes a discussion of the compromise model. This discussion is important because the compromise model is a component part of the exchange model and, moreover, there is an interpretation of the compromise model that links it to a particular type of influence process. Section 3 describes the relevant aspects of the research design. Section 4 provides an illustration of the models with a case study on a regulation on fisheries infrastructure. Section 5 presents the results, and Section 6 summarises the findings and conclusions to be drawn from these analyses.

2. Models

We begin by describing the challenge model, and then introduce the exchange model and our interpretation of the compromise model.

2.1 The challenge model

According to the challenge model (Bueno de Mesquita 1985, 1994, 2002), actors attempt to strengthen the coalition surrounding their own policy positions by compelling or persuading other actors to change the positions they take. The variables required as input for the challenge model are actors' bargaining positions⁵, their capabilities, and the levels of salience they attach to the issues concerned. Differences between the actors in terms of their capabilities and salience scores drive the process of challenge. Power dominance matters more than convincing arguments according to this conception of political bargaining. Influencing others according to this mode of interaction is a precarious business; even when an actor has been compelled or persuaded to shift its position toward

particular the t-tests and correlations on which these conclusions are based are inappropriate'. Nevertheless, the challenge model 'generated predictions that have somewhat lower errors on average than the other models, ... but these were shown not to be significantly smaller than the simple compromise model'.

⁵ The challenge model uses current bargaining positions rather than ideal points. The challenge model assumes that the stated bargaining positions reflect a strategic trade off between the policy outcome the actor most desires and the expected outcome.

that of a challenger, it might shift its position in the opposite direction during a subsequent round of the negotiations if that brings it back closer to its initial bargaining stance. Thus, the commitments actors make to shift their positions are not binding, and the challenge model is therefore a *non-cooperative model of decision-making*.

The decisions faced by each of the actors involved in this bargaining process are modelled explicitly. Each actor has to decide whether or not it will challenge the position taken by each other actor on a certain issue. This decision is based on the expected outcome of either challenging or not challenging the other's position. The value of the expected outcome of each challenge is calculated in terms of its expected effect on the decision outcome. Challenges that are expected to bring the decision outcome closer to an actor's position will tend to be waged by that actor. It is assumed that the position of the *weighted median voter* is perceived by all actors to be the likely decision outcome, whereby the positions are weighted by the actors' capabilities and the levels of salience they attach to the issue (Bueno de Mesquita 1994: 77-82). Therefore, actors are engaged in a struggle to pull the position of the weighted median closer to their favoured policy alternative. The model assumes that actors bargain on the issues separately.

Figure 1 illustrates the choices each actor, in this case actor i , faces with respect to each other actor, in this case actor j , on any given issue, in this case issue a . Actor i may challenge actor j , or may decide not to do so. If actor i challenges j (the right side of Figure 1) then actor j can either give in or resist the challenge. If actor j gives in, then it will have to support the policy position of the challenger (actor i). If, however, actor j resists, there are two possibilities: the challenger (actor i) wins or the opponent (actor j) wins. Alternatively, actor i might decide not to challenge j (the left part of Figure 1). In that case, actor j will not move due to challenges by actor i . However, due to challenges from other actors, j may move, resulting in a better or worse policy outcome from the perspective of actor i . These computations also take into account the support actors i and j receive from other actors. Each of the actors calculates the utility of each alternative and the likelihood of its occurrence. This calculation requires an estimate of the utility and the likelihood of occurrence from the perspective of the opponent. With respect to actors' calculations of their opponents' expectations, the model simulates misperceptions, because actors do not consider the possibility that some actors are more risk acceptant and others

risk averse. These computations also take into account the support actors i and j receive from the other actors.

The expected utility for i of challenging j is computed as follows. The likelihood that actor j will resist a challenge by i is estimated by the salience actor j attaches to issue a , denoted by s_{ja} . The likelihood that actor j will give in is equal to $(1 - s_{ja})$. In the latter case, actor j will support the actor i 's policy position. The utility for actor i of this move by actor j is denoted by $u^i \Delta x_{ja}^+$. If actor j resists the challenge, then actor i can either win or lose. In the first case, the shift of actor j 's position toward that of actor i has a utility of $u^i \Delta x_{ja}^+$ for actor i . If actor i loses, she is forced to support j 's position. The negative utility for actor i of that move is denoted by $u^i \Delta x_{ja}^-$. The likelihood of success or failure for actor i in such a dispute depends on the relative powers of stakeholder i and j , denoted by p_{ij} . This value depends on the leverage (capability times salience) each of the actors is willing to invest and the support each of them receives from third actors. The expected utility for actor i of challenging actor j on issue a is equal to:

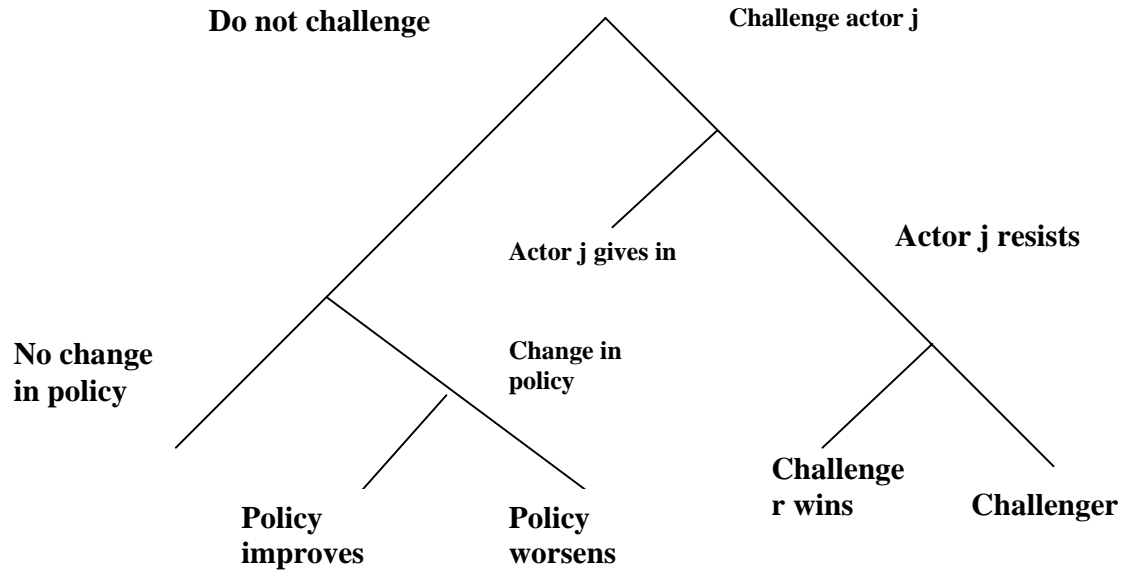
$$E^i u^i \Delta x_{ja} | \text{Challenge} = s_{ja} \{ p_{ij} [u^i \Delta x_{ja}^+] + (1 - p_{ij}) [u^i \Delta x_{ja}^-] \} + (1 - s_{ja}) [u^i \Delta x_{ja}^+] \quad (1)$$

In a similar way, we compute the expected utility for actor i of not challenging the policy position of actor j . If j is not expected to shift its position due to challenges from other actors, then j is expected to remain on the same position. The utility for actor i of no change in the current positions of the stakeholders on issue a is denoted by $u^i \Delta x_{ja}^0$. The expected utility of not challenging another actor, j , is then simply:

$$E^i u^i \Delta x_{ja} | \text{No Challenge} = u^i \Delta x_{ja}^0 \quad (2)$$

Figure 1: Bueno de Mesquita's challenge model (the expected utility model, 1985)

The decision facing actor *i* regarding actor *j*.



The total expected utility for actor *i* with respect to the challenge of actor *j* is now equal to:

$$E^i u^i \Delta x_{ja} = E^i u^i \Delta x_{ja} | \text{Challenge} - E^i u^i \Delta x_{ja} | \text{No Challenge} \quad (3)$$

The challenge model is an iterative model consisting of a number of bargaining rounds (usually around three). At the end of each round, each actor receives a set of challenges from others. If the set contains more than one challenge, the recipient actor selects the one that requires the smallest shift in its policy position (relative to the original starting position rather than her current position). The result of this challenge is either conflict (if the recipient also made a challenge to the actor from whom the challenge came) or is compelled to shift its position toward that of the challenger. The shift may reflect a compromise that falls between the two stakeholders' positions, or a capitulation by one to the other. These position shifts occur at the end of each round of bargaining and create a new constellation of positions. These new positions are taken at the start of the subsequent round of bargaining. In that new setting, actors repeat the same process. This continues until none of the actors shift their positions (substantially) or until all converge on the same position.

The forecast of the decision outcome is generated on the basis of the policy positions after the final round of bargaining. It is assumed that the *weighted median voter rule* also determines the outcome *in the voting stage*, but now based on the *final*, rather than the initial *positions*. The transformation of the final positions into the outcome could conceivably be based on another rule, perhaps one based on the formal procedures in the European Union.⁶ The core of the challenge model concerns the transformation of initial to final positions, *not* the final transformation of these positions into an outcome. During the influence process, actors use the weighted median voter rule to form their expectations on the effects of their challenges.

2.2 *The exchange model*

According to the exchange model (Stokman and Van Oosten 1994; Stokman et al. 2000), the influence process is defined by agreements between pairs of actors on pairs of issues, whereby one actor agrees to shift its position on an issue of relatively lower importance to it in return for concessions from the other actor on an issue of relatively more importance to that actor. For exchange to be profitable, both potential exchange partners must take opposing positions on both issues, and attach different relative levels of salience to the two issues. When actors agree to shift their positions as part of an exchange agreement, these shifts are binding and cannot be reneged upon. The exchange model is therefore a *cooperative model* of political bargaining.

The compromise model is essential to understanding the workings of the position exchange model. The compromise model is the mean average of the actors' positions on each issue considered separately, weighted by their effective capabilities (capabilities times salience). The forecast of the compromise model is important to the workings of the position exchange model in three respects. First, it is assumed that exchanges take place between pairs of actors who take positions on opposite sides of the compromise model's forecast on both issues involved in the exchange. Second, actors evaluate the gains from exchange in terms of their effects on the expected decision outcomes, as defined by the forecast of the compromise model on the basis of the revised policy positions after

⁶ Future research might consider transformation rules other than the weighted median voter for the challenge model and the weighted mean for the position exchange model.

exchange. Third, after the exchanges have been realised, and the actors have moved to new positions as a result of these exchanges, the compromise model is used to transform these final voting positions into a decision outcome. There are several theoretical reasons for incorporating the compromise model in the exchange model, rather than, for example, the weighted median voter, as is the case in the challenge model

Van den Bos (1991) proposed the compromise model in the context of his study of European Community decision making. When introducing this model, he referred to the strong pressure to reach decision outcomes that are acceptable to all, in combination with the special role of the Presidency of the Council, probably in collaboration with the Commission, in proposing solutions. Van den Bos assumes that such a solution “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” (Van den Bos 1991: 176).

The specific interpretation given by Van den Bos in the context of the European decision making corresponds with more general interpretations of influence processes in which actors’ *common interests*, based on functional interdependencies, are more important than their *diverging interests* (Lindenberg 1997). The mechanism by which agreements are achieved in such situations is mutual persuasion. Information-based influence processes are often represented in contagion models (Friedkin and Johnsen 1990; 1997; Marsden and Friedkin 1993 and Leenders 1995; 2002) and in repeated games. These models represent social influence in the form of an influence network, reflecting the dyadic influences of actors on each other. In their two stage model of decision making, Stokman and Van den Bos (1992) connect such influence processes to collective decision-making, by integrating political influence networks with the most important elements of decision situations: the positions actors take on issues, the salience they attach to those issues and their relative capabilities. The two stage model is a network based model of political influence, in which actors adjust their positions on the basis of the influence of other actors to whom they are connected in the network. This influence takes into account the actors’ capabilities and saliences. If the network is complete, a common position results that is equal to the predicted outcome of the compromise model. The solution of the compromise model is therefore related theoretically with influence network models, representing processes based on persuasion. The type of adaptation of policy positions

posited in information based network models is distinct from that proposed in the exchange (and challenge) model considered here. On the basis of persuasive information, the shifts in actors' positions may be conceived of as being akin to shifts in their preferences. By contrast, in the challenge model actors can be compelled to support positions other than their initial ones⁷; in the position exchange model, actors find expedient to shift policy positions.

Christopher Achen shows (2006) that the predicted outcome of the compromise model is an approximation of the n-person Nash Bargaining Solution, when disagreement is much less desirable than any of the other alternatives being considered. This strengthens the interpretation of the compromise model as a *cooperative*, information-based network solution: an outcome that incorporates divergent interests as much as possible. The compromise model does not, however, provide an analysis of the process through which decisions are reached, something that both the exchange and the challenge models do. By incorporating the compromise solution into the exchange model, we connect a cooperative exchange model with a cooperative influence model. The exchange model (in which positions are exchanged) can thus be understood as an intermediate stage in the compromise model (in which information is exchanged). If no exchanges are possible, compromise is assumed to take place on the basis of the initially favoured positions; if exchange is possible, such compromise will take place on the basis of the new voting positions.

Actors can engage in mutually beneficial exchanges if two criteria are met (Stokman and Van Oosten 1994). First, they must take different positions on two issues, such that they are located on opposite sides of the expected outcome (as defined by the compromise model) on both issues. Second, they must attach different relative levels of salience to the two issues. Figure 2 describes the most important exchange possibilities in terms of positions held by the stakeholders. Four groups of actors can be distinguished. Actors in group 1 (G1) are located on the left side of the expected outcome on both issues; actors in group 4 (G4) on the right side. They take opposing positions on both issues and

⁷Note that the challenge model allows compromise as well as shifts through force. Actors can shift or compromise because they believe they will be better off than if they had not shifted. They can choose to move toward some other player because it improves their welfare compared to what they anticipate would happen if they did not shift toward that actor, even if the other actor does not threaten any form of punishment. The persuader may simply provide a coalition opportunity that neutralises an anticipated threat from some other player.

are therefore potential exchange partners. The same holds for the group 2 (G2) and group 3 (G3). Since G1 and G2 have the same position on issue a, they cannot exchange. G1 and G3 cannot exchange as they have the same position on issue b. Each actor, in this case actor i , evaluates utility gains from exchanges on the basis of shifts in expected outcomes on the issues, using the following loss function:

$$L_i = \sum_{a=1}^m -s_{ia} |x_{ia} - O_a| \quad (4)$$

where x_{ia} and s_{ia} are defined as above and O_a denotes the expected outcome on issue a with $0 \leq x_{ia}, O_a \leq 1$ and $0 < s_{ia} \leq 1$.

Figure 2 : Position exchange possibilities

		Issue b	
		Left	Right
Issue a	Left	G1	G2
	Right	G3	G4

Our model of exchange assumes that exchanges are carried out at one particular exchange rate contained in the core, namely equal utility gain for both stakeholders involved.⁸ For the exchange partners to obtain maximum possible utility gain from the exchange, at least one of the actors shifts its voting position completely to the position of the other, while the other shifts its position only partly towards the position of the first actor.

⁸ The exchange rate of equal utility gain involves a comparison of utilities between individuals. Alternative exchange rates include the Raiffa-Kalai-Smorodinski solution (RKS) (Friedman 1990, 218-23) or the Nash Bargaining Solution. Van Assen (2001) compares the three solutions. Only under certain conditions do RKS and Nash differ from equal utility gain. A comparative analysis of the three exchange rates in empirical applications resulted in only marginal differences in the predicted outcomes. An exchange rate based on equal utility gain makes the ordering of potential exchanges easier, since their order in terms of utility gains is the same for the two actors involved in the exchange.

When the exchange model is applied, a list of all potential exchanges between all pairs of actors and all pairs of issues within a commission proposal is generated.⁹ The potential exchanges are ordered on the basis of the potential utility gains experienced by the two exchange partners. Exchanges are realised in that order. Each actor's position shift on its supply issue is binding, in the sense that it cannot move back toward its initial position. Therefore, the realisation of an exchange often excludes certain exchanges ranked lower down the list. However, if an actor does not shift completely toward the position of its exchange partner, it may shift further in that direction in a subsequent bilateral exchange. The whole process ends when no potential exchanges remain. The final outcome is determined on the basis of the voting positions of the stakeholders after the exchange process, applying the compromise solution to the voting positions.

3. Research Design

The data set used to apply and test the models described previously contains information on 66 legislative Commission proposals. These proposals were selected to obtain a number of issues (154) from a range of policy areas. The proposals were selected on the basis of three criteria: the type of legislative procedure to which they were subject (either consultation or codecision), the type period in which they were introduced and discussed as well as their political importance and level of controversy. Interviews with experts were required to collect the data needed to apply the models. The decision situations experts had to describe had to be relatively recent and fresh in their memory. This had implications for the time period we could cover. All proposals selected were negotiated between January 1999 and December 2000. The criterion about the political relevance of the proposal is referred to the need that any selection of proposals had to raise some minimum level of controversy. This is probably the most basic requirement for the application of the negotiation models. The selection of proposals includes proposals for new and amendments to existing directives, regulations and decisions. The Commission proposals

⁹ The position exchange model would be able to generate a list of new exchanges between pairs of actors as a consequence of the shifts in positions generated by previous exchanges. However, this more elaborate model does not provide additional theoretical insights or more accurate predictions in the present application.

selected cover a broad range of policy areas, including internal market, agriculture, transport, energy, economic and financial affairs, health, or justice and home affairs. Thus, the 66 legislative Commission proposals selected for our study are an exhaustive sample of proposals that meet the above mentioned criteria; they are not a random sample of EU legislation.

Interviews with experts were needed. These individuals are the best source of information on the controversial issues that had to be solved during the discussions of legislative proposals, and the decision outcomes favoured most by the actors involved. Experts had to describe and to illustrate the main elements of negotiation in terms of one or more policy issues represented in a uni-dimensional scale. Subsequently, experts had to specify the policy positions on each issue of each actor after the introduction of the proposal. The most basic criterion for an issue specification was that at least one of the actors involved in the formal bargaining process took a different policy position from the rest of actors. The issues analysed represent the more controversial points bargained on each Commission proposal. Actors involved within an EU bargaining situation must take different policy positions on the dimensions investigated. Thus, in issue specification, at least two extreme positions will be identified. Other characteristic is that each issue specified must be uni-dimensional. This means that each issue can be visualised as a policy *continuum* on which EU stakeholders can be positioned according to the policy outcomes they support. Each stakeholder involved in the bargaining process was susceptible to be located on one point of the '*issue continua*'. Issues are independent dimensions and each of these dimensions provides a political outcome. Finally, all issues together determine the final political outcome of the legislative proposal.

The location of the actors' policy positions on the scale intends to reflect the judgment of the policy expert regarding existing political distances between alternatives. Positions that lie further away from that of an actor are evaluated more negatively by that actor. This is the assumption of the *single peaked* preferences function. This assumption means that actors expect to receive more utility the closer the policy outcome is to its position.

Experts were asked to provide information on the policy alternative most preferred by each actor immediately after the introduction of the proposal by the Commission. Policy experts were also asked to estimate the level of importance or salience each of the

actor attaches to each issue investigated. When actors attach a high level of salience to an issue, they are considerably sensitive to small deviations from their most preferred policy alternatives. Policy experts were asked to estimate the level of salience each actor attached to each issue on a scale from 0 to 100. A score of 100 means that an issue is considerably important for an actor while a score of 0 means that issue has no importance for the actor. A score of 50 means that the issue has an average level of priority for the actor and that it is willing to use arguments but no power politics to convince other actors. When the expert was estimating the variable salience, they had to provide substantive arguments.

The last input variable we use for the application of our models are actors' capabilities. There are two ways to specify actors' capabilities. The first is to ask policy experts and the second is to use voting power indices. In this paper we use both methods. Firstly, with respect to expert judgments, the main reason for testing the models according to expert judgments is related to the idea that it allows us to test a combination of formal and informal capabilities held by the different actors. This concept of capabilities that experts are asked to estimate, therefore, includes informal resources that actors have and use in the negotiation process, such as the efficiency and expertise of the bureaucracy, leadership, financial resources or access to other actors. Those resources may influence to some extent the performance of actors during the negotiation process, and ultimately, the outcome of the bargaining process itself. In the interviews, experts had to provide judgments on the distribution of the 17 actors' capabilities. They were asked to rate the capabilities of the three EU institutions (the Commission, the Council and the EP) relative to each other. They also had to justify and illustrate their estimations qualitatively.

The second method used to obtain estimations of actors' capabilities was the Shapley Shubik Index (SSI). The SSI is a power index that provides an approximation of actors' formal power. The SSI score is based on the number of times an actor is pivotal in a coalition, in the sense that it is necessary in order for that coalition to be winning. It is based on information regarding the voting rules only. In order to apply SSI, the composition of winning coalitions must be established according to the inter-institutional nature of the decision-making (Napel and Widgrén 2002). The present research identifies two variants of SSI scores. In the first variant, the Commission is always in the winning coalition under both co-decision and consultation procedures. In the second variant, the Commission is not necessarily a member of the winning coalition. There are arguments for

applying both. The argument for the first variant is that the support of the Commission is generally seen as fundamental before legislative acts can be adopted. However, formally, the Commission is not an indispensable member of the winning coalition. For example, a unanimous Council can overrule the Commission, or Council and EP can reach agreements under co-decision without the support of the Commission. While capabilities of actors is a concept which is extraordinarily difficult to measure using policy experts, the advantage of using the Shapley Shubik Index (SSI) is the clarity behind the reasoning of its estimations. In this paper both estimations are used. Therefore, three different versions of actors' capabilities are used, power estimations based on expert judgments and on two different variants of the SSI scores (see Table 1). This allows the testing of the sensitivity of the models to variations in the distribution of actors' capabilities.

Table 1: Relative power of EU institutions, expert judgments and Shapley Shubik scores

Co-decision		Commission	Council	EP
Expert judgments (both QMV and unanimity)		95	100	87
SSI- I	QMV	52	100	52
	Unanimity	7	100	7
SSI- II	QMV	0	100	45
	Unanimity	0	100	7
Consultation		Commission	Council	EP
Expert judgments (both QMV and unanimity)		92	100	34
SSI- I	QMV	45	100	0
	Unanimity	7	100	0
SSI- II	QMV	33	100	0
	Unanimity	0	100	0

SSI-I: with Commission in winning coalition; SSI-II: Commission not needed in winning coalition

According to these scores, the Commission does not feature in the co-decision issues; the bargaining takes place between the Council members and the European Parliament. Although the Commission may be a member of the coalition that supports the final decision outcome, it is assumed not to be essential to the success of that coalition. The European Parliament has a score of 45 relative to the Council's capability score of 100 under the Qualified Majority Voting (QMV) variant of co-decision, and a score of 7 under the unanimity variant. This low score under the unanimity variant is due to the fact that all 15 member states and the EP have to support the decision outcome for it to be adopted. Under consultation, the EP never features in the decision making process. Under the QMV variant of consultation, the Commission is equal to a third of the total Council's capability score, and has a score of zero under the unanimity variant. This score of zero is due to the fact that a unanimous Council is assumed to be able to overrule the Commission under the consultation procedure. We also experimented with the other two sets of scores that ascribe higher scores to the Commission and EP. These yielded poorer predictions. The errors of the models using other capability scores will be reported in footnotes.

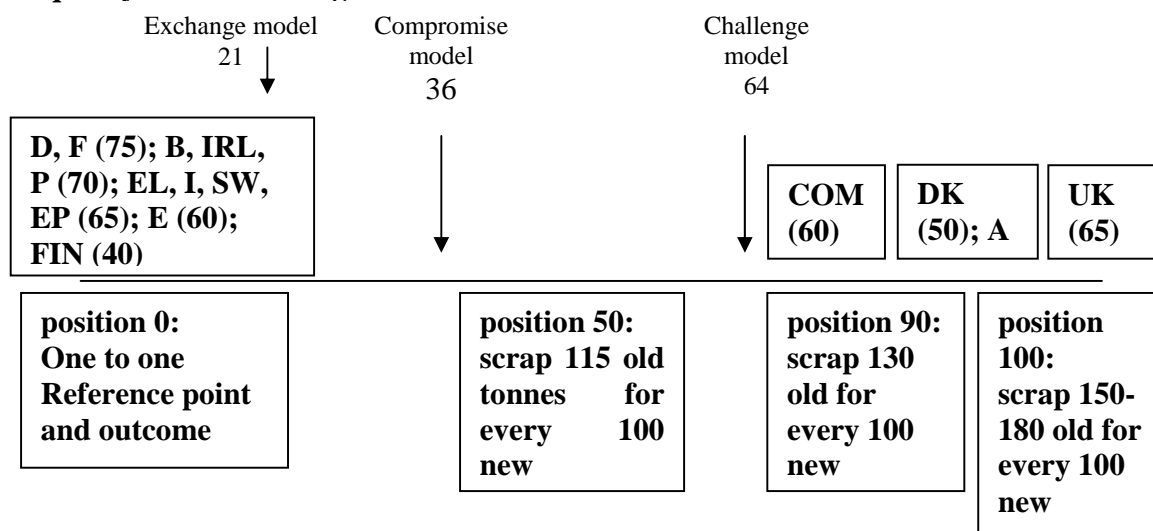
The exchange model is applied to all Commission proposals with at least two controversial issues. Eight issues drop out of the analyses when the above mentioned variant of the SSI scores is used. In these cases, the controversy lay between the Council and either the Commission or EP. Since the Commission and the EP do not feature in these analyses, the issues can no longer be described as controversial. We therefore have 154 issues to which we can apply the challenge model (and the compromise model), and 137 issues from 49 Commission proposals on which we can apply the exchange model.

4. An illustration: Reform of structural assistance in the fisheries sector

To illustrate the application of these models, we refer to the example of a proposal for a regulation on fisheries policy. The proposal was an attempt by the Commission to reconcile a perceived contradiction in EU policy. On the one hand, the European Union has an ongoing programme to control the size of fishing catches (in the framework of the Multi-annual Guidance Programme: MAGP). On the other, the EU provides subsidies for the renewal of fishing fleets. Because new ships are more efficient than older ones, this

contributes to larger fishing catches. The legislative proposal was introduced by the European Commission in December, 1998 (OJ C 1999/16/12), and after debate in the Council of Ministers, adopted in December 1999 (OJ L 1999/337/10). Two issues had to be resolved before the proposal could be adopted (see Figure 3).

Issue 1: Scrap-build penalty: How many tones of old fishing fleet need to be scrapped to qualify for EU funding for fleet renewal?



Issue 2: Linkage with MAGP objectives: To what extent should EU funding for fleet renewal be linked to the extent to which member states meet the multi-annual guidance programme objectives?

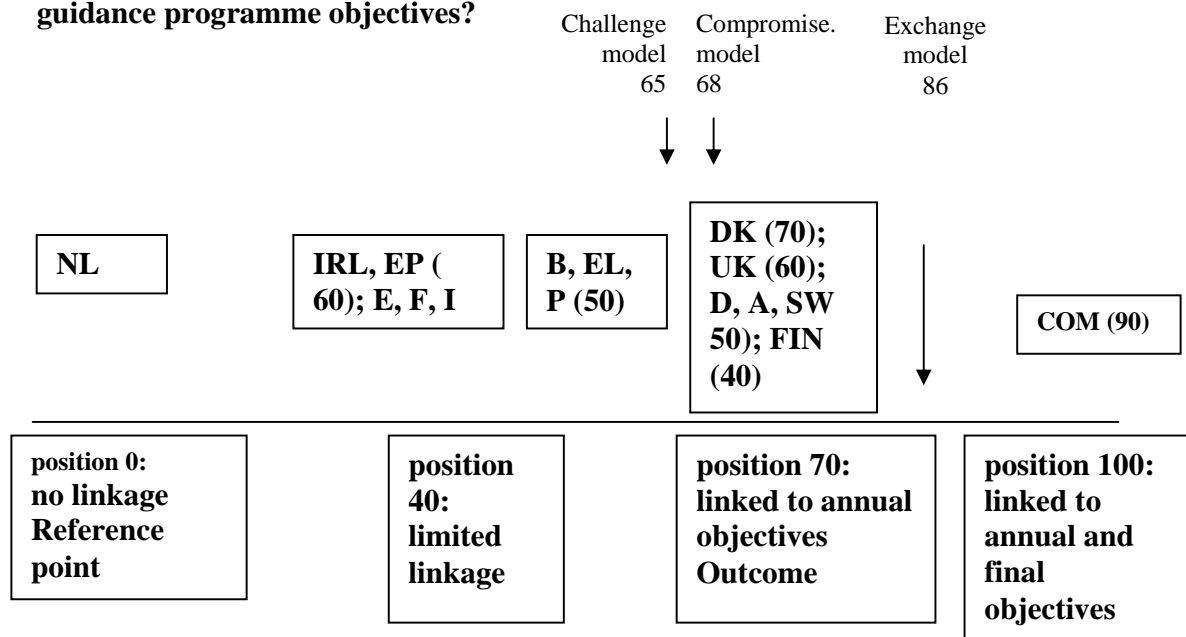


Figure 3: Illustration of model predictions on Commission Proposal for a Council Regulation laying down the detailed rules and arrangements regarding the Community structural assistance in the fisheries sector (CNS/1998/347). Saliency scores in parentheses.

The first issue concerned the size of the scrap-build penalty. This issue refers to the question of how many tonnes of old fishing fleet should be scrapped in relation to new fishing fleet to qualify for subsidy. This issue was contested for both environmental and budgetary reasons. The actors in favour of a large scrap-build penalty argued that this would restrict the demand for subsidies for fleet renewal. This would mean that newer, more efficient boats with higher ‘killing power’ would be introduced at a slower pace. In the proposal, the European Commission called for a scrap build penalty of 130 tonnes of old ship for every 100 tonnes of new ship. The UK favoured the most extreme position, a scrap-build penalty of 150 to 180 tonnes of old ship for each new ship of 100 tonnes. On the issue continuum, the scale position of 100 was used to represent this position. The other extreme, scored as 0, was the *status quo* position at that time, requiring a penalty of 100 tonnes for every new 100 tonnes. Most member states favoured the continuation of the status quo when the proposal was introduced.

According to the expert, the Commission’s most favoured outcome on this issue (a scrap build penalty of 130 tonnes) should be scored as 90 on our scale, much closer to the UK’s position than to the *status quo*. Two member states, Denmark and Austria, were placed between 90 and the most extreme score. The Dutch delegation was said not to have participated in the discussions on this issue, and was therefore not attributed a position. We were informed that this had to do with a disagreement between the Dutch Ministry of Fisheries and Agriculture on the one hand, and the Ministry of Environment on the other. As a result of this disagreement, no coherent EU position was formulated. During the course of the negotiations, a compromise proposal was made that then received the support of some member states, but this was not incorporated into the final decision outcome: the key informant located this compromise position half way along the continuum, at position 50. According to the expert, the final outcome could best be described as a continuation of the *status quo* on that issue, corresponding with position zero on the first issue scale.

The second controversial element was the proposed linkage of the subsidy with the achievement of member states' annual and final objectives in the MAGP. The specific policy question addressed here was the extent to which member states must achieve their objectives to qualify for subsidy. Most member states have some difficulty meeting the MAGP objectives. Introducing strict adherence to these objectives as a necessary condition for obtaining subsidy would have negative financial consequences for the sector. The European Commission took the position that strict adherence to all MAGP objectives should be a condition for receiving subsidy for fleet renewal. This position was scored as 100 on our scale. The Netherlands was said to have most difficulty meeting the MAGP objectives, which caused the Dutch to take the most extreme position on the other side of the continuum. They would have preferred no linkage at all between the subsidy for building new boats and the extent to which MAGP objectives were met, which was the status quo position at that time. Most other member states took intermediate positions. The UK, Germany and four other delegations were in favour of linking the subsidies to annual objectives only (position 70). France, along with three other member states, favoured a more limited linkage (position 40). Belgium, Greece and Portugal were said to favour a somewhat stronger linkage than France, but considerably less than the UK and Germany. They were placed at position 50 on the scale to represent this. The actual outcome is described by position 70 on the issue scale: linked to the annual but not final MAGP objectives.

As described above, in the exchange model it is posited that actors identify mutually beneficial exchanges of voting positions on pairs of issues. Such an exchange process is expected to be particularly prominent when actors who take very different *positions* on the two issues also attach very different levels of *salience* to the two issues. In particular, the first criterion that must be met before an exchange is possible is that the pairs of stakeholders engaged in the exchange must take positions on opposite sides of the expected outcome on the two issues. The expected outcome is defined by the prediction of the compromise model (the average of the positions weighted by capabilities times salience).

The predictions of the compromise model are positions 36 on issue 1 and position 68 on issue 2. Table 2 shows the positions of the actors in relation to these expected outcomes, and identifies which actors might be able to engage in exchanges of voting

positions. On the basis of the actors' initially favoured positions, it is clear that the only possible exchanges that could take place are between actors to the left of the expected outcome on both issues, and those to the right of the expected outcome on both issues. The three actors to the left on issue one and to the right on issue two (D, FIN and SW) have no potential exchange partners.

Table 2: Potential exchange partners in Commission proposal on structural assistance in the fisheries sector. Positions in relation to expected outcome

		Issue 2: linkage to MAGP	
		Left	Right
Issue 1: scrap-build penalty	Left	B, E, EL, F, I, IRL, P, EP	D, FIN, SW
	Right	None	COM, A, DK, UK

Luxembourg did not take a position on either issue. The Netherlands took a position on the linkage issue

The second criterion that must be fulfilled before an exchange can be realised is that the stakeholders involved must attach different relative levels of salience to the two issues. Only if there is a difference between the relative levels of salience attached to the two issues, will the exchange be of benefit to both stakeholders engaged in it; otherwise they cannot exchange. The comparison of the relative levels of salience also determines the direction of the exchange: which stakeholders will move in which direction during the exchange.

In this example, exchanges involving the Commission drive the predictions. The Commission attached a higher level of salience to the linkage issue (issue 2) than to the scrap build penalty issue (issue 1). This linkage issue was said to be more strongly related to the main objective of the proposal according to the Commission: namely, dismantling the apparent contradiction between fleet renewal and conservation referred to above. It was estimated that the Commission attached a salience score of 60 to issue 1 and 90 to issue 2. According to the logic of the position exchange model, the Commission would have been interested in an exchange whereby it shifted its position on the scrap build

penalty issue (issue 1) in return for the support of other actors on the linkage issue (issue 2). The question is whether the actors, who were in a position to engage in such an exchange, would find this proposition attractive. As it happens, all of the actors to the left of the expected outcome on both issues, the Commission's potential exchange partners, attached more importance to the scrap build penalty issues than the linkage issue. This is the opposite prioritisation to that of the Commission.¹⁰ For example, the French representation was estimated to attach a salience of 75 to the scrap building penalty issue, and 50 to the linkage issue. According to the position exchange model, this is indeed the first exchange realised. The Commission moves leftward on the scrap build penalty issue, and occupies a position closer to the *status quo* (position 73 on the continuum to be exact). In return, France shifts its position to 100 on the linkage issue. In subsequent exchanges, the Commission continues to drift toward the *status quo* on the scrap build penalty issue, and to receive the support of other member states on the linkage issue. As a result of these shifts, the expected outcome generated by the position exchange model is close to the left of the issue continuum representing the scrap build penalty issue (on issue one the prediction is 21), and close to the right of the right of the continuum representing the linkage issue (on issue two the prediction is 86).

The predictions of the challenge model in this example are influenced greatly by the differences between the stakeholders in terms of their risk propensities. An actor's risk propensity determines whether it will seek out conflict with other stakeholders and defend its policy position vigorously if it is challenged by another. In the challenge model, the risk propensity is influenced by the distance between an actor's policy position and the expected outcome. The challenge model defines the expected outcome as the median average position (weighted by the product of the actors' capabilities and salience). In the scrap build penalty issue in the example, the weighted median position is zero on the scale, which accords perfectly with the actual outcome. In the challenge model, the expectation of this outcome induces the actors who support this position to be risk averse, and those who are distant from it, namely the Commission, Denmark, Austria and the UK, to be risk seeking. According to the model, these four stakeholders are successful at demolishing the

¹⁰ Exchanges are feasible when one the level of salience actor *i* attaches to the first issue relative to the second issue differs from that of actor *j*. Exchanges may therefore well occur between actors who both attach the highest level of salience to the same issue.

support for the continuation of the *status quo*. Within a few rounds of simulated negotiations, there are no stakeholders left supporting the *status quo*; they all shift their positions to the right half of the continuum representing the scrap build penalty issue. This is not an accurate description of the events leading to the actual decision outcome.

The illustration makes clear that models containing the same information can make substantially different predictions of decision outcomes, as the comparison between the predictions of the challenge and the exchange models' predictions on issue one makes clear. The exchange model performed rather well in this particular case. The illustration provided in this section is of course just that; it was intended to clarify the workings of the models, and should not be seen as a substitute or alternative to the quantitative analyses performed in the following section.

5. Analysis

Which model generates the most accurate forecasts of decision outcomes in the EU?¹¹ Table 3 provides the first cut answer to this question. It contains the average absolute distances between the actual outcomes and the model forecasts on the 100 point issue scales of the sort referred to in the illustration. The compromise model performs best with an average error of 23.48. The exchange model is slightly worse with an error of 25.19, and the challenge model is the least accurate with an error of 28.84. The difference in the level of accuracy of the compromise and challenge models is relatively large.¹²

¹¹ Note that our models can be tested in two different ways. First, as in the present paper, the models can be tested at the collective (or macro) level by identifying the accuracy of their predictions of decision outcomes. Second, our models can also be tested at the actor (or micro) level, by comparing the accuracy of their predictions of the shifts in actors' policy positions. This second type of analysis appeared on an issue of European Union Politics in 2004.

¹² A non parametric test – Wilcoxon's signed rank test – indicates that the challenge model's predictions are significantly worse than those of the compromise model ($p = .008$). The differences between the accuracy of the predictions by the other models are not significant.

Table 3: Summary of error of models on issues¹³

Model	Error of models on all issues
Compromise model	23.48 (n=154)
Exchange model	25.19 (n=137)
Challenge model	28.84 (n=154)

Note: The forecasts examined in this and the following tables were made using the Shapley Shubik Index scores (version 2 that includes the possibility of a winning coalition without the Commission) described in Table 1.

Table 4 contains the errors by the type of issue: dichotomous, rank order or scale. There are substantial differences between the performance of the compromise and challenge model across the types of issues. The errors of these models are substantially higher when dichotomous issues are concerned. The errors of the exchange model appear to be relatively unaffected by the type of issue, so that it has the lowest errors for dichotomous issues.

Table 4: Summary of error of models by type of issues¹⁴

	Dichotomous	Rank order	Scale
Compromise model	38.10 (n = 26)	21.02 (n =109)	17.61 (n = 19)
Exchange model	28.92 (n=23)	24.41 (n=98)	24.63 (n=16)
Challenge model	39.62 (n = 26)	27.02 (n = 109)	24.52 (n = 19)

¹³ On the basis of expert judgements of capabilities the errors are: compromise model 26.2 (n=162); position exchange model 26.2 (n=148); challenge model 31.2 (n=162).

¹⁴ The error of the compromise model using the first version of the SSI scores is 33.8 for dichotomous issues, 21.2 for rank order issues, and 18.6 for scale issues. The mean errors of the exchange model become smaller using the first version of SSI scores. Thus, the average error for dichotomous issues is 25.4, for rank order issues 23.9, and for scale issues is 23.8. The challenge model makes slightly better predictions with the first version of SSI scores on dichotomous issues in which the average error is 33.4. It has the same error regarding scale issues (23.2) and has a higher error for rank order issues (29.7).

Table 5 contains the errors of the models on issues subject to different legislative procedures. For the consultation issues, the most accurate model is the compromise model. For the co-decision issues, both the QMV and unanimity variants in the Council, the exchange model generates the most accurate forecasts.

Table 5: Summary of error of models on issues by legislative procedure¹⁵

	CNS QMV	CNS Una.	COD QMV	COD Una.
Compromise model	23.31 (n=55)	18.57 (n=31)	27.28 (n=56)	19.24 (n=12)
Exchange model	26.84 (n=53)	22.50 (n=22)	26.12 (n=51)	18.30 (n=11)
Challenge model	30.12 (n=55)	26.84 (n=31)	29.82 (n=56)	23.60 (n=12)

Table 6 reports the errors of the models on issues in different policy areas. A division is made between agriculture, internal market and 'other policy areas'. The last category includes issues related to a number of areas, including fisheries, culture, and transport. These categories were placed together because each contained relatively few issues. In agriculture and 'other' policy areas, the most accurate model is the compromise model. In issues dealing with internal market policies, the most accurate model is the exchange model with an average error of 27.81. There appears to be a substantial amount of variation between policy areas, especially between the 'other' category and the first two policy areas.

¹⁵ When we used as input data the first version of SSI scores for the power estimates we obtained a very similar pattern of errors to those reported in Table 5. The average errors of the compromise model with the first version of SSI scores are the following: under consultation QMV 23.9, under consultation unanimity 18.7, under co-decision QMV 27.7 and under co-decision unanimity 17.6. The exchange model also shows similar error patterns to those reported: under consultation QMV 26.7, in consultation unanimity 22.1, under co-decision QMV 24.5 and under co-decision unanimity 16.3. Finally, when we used the first version of the SSI scores in the input data for the challenge model the errors are 30.6 under consultation QMV, 24.1 in consultation unanimity, 32.2 under co-decision QMV and 27.5 under co-decision unanimity.

Table 6: Summary of error of models on issues by policy areas¹⁶

	Agriculture	Internal Market	Other policy areas
Compromise model	26.61 (n=40)	31.28 (n=34)	18.61 (n=80)
Exchange model	30.29 (n=39)	27.81 (n=31)	21.01 (n=67)
Challenge model	30.07 (n=40)	33.80 (n=34)	26.11 (n=80)

Equation 4 makes it possible to compute the effects on each actor's expected utility, as a result of the exchanges on each pair of issues. These changes in utility can be divided into different components. These are the possible gains as a result of exchanges in which each actor itself is involved, and the utility changes from the positive and negative externalities from the exchanges involving other actors. Since these utility gains concern exchanges between pairs of issues, aggregation of the utility gains per issue would result in issues being counted more than once. We therefore aggregated them at the level of Commission proposals, which avoids double counting.

Table 7: Distribution of utility gains from bilateral exchanges within Commission proposals

	N	Minimum	Maximum	Mean	Std. Deviation
Own gains	49	.00	.41	.11	.10
Negative externalities	49	-6.75	.00	-1.28	1.62
Positive externalities	49	.00	3.14	.70	.80
Total gains and losses	49	-4.75	1.47	-.47	1.11

¹⁶ The error terms by policy areas using the first version of the SSI scores are the following: the compromise model has an average error of 27 in agriculture, 30.4 in issues related to internal market, and an average error of 19.2 for the issues in other policy areas. The exchange model shows has an average error of 29.3 on agriculture issues, 29.1 on issues in the internal market area, and 19.5 for the other issues. The challenge has an error of 31.2 for agriculture issues, 33.7 for internal market issues and, finally, an average error of 26.8 for issues in other policy areas.

Table 7 contains information on the ‘own gains’ - the utility gains of the actors involved in exchanges – and the positive and negative externalities of those exchanges for the other actors. The total of these three components is also given. These figures are calculated for each Commission proposal, aggregating the gains and loses over all exchanges within such a proposal. Table 7 provides these figures for the 49 Commission proposals to which the exchange model was applied (those that contained more than one issue). This table reveals two remarkable things. First, we see that the externalities are substantially higher than the own gains. This is due mainly to the large number of actors involved. Second, we see that the negative externalities tend to be twice as large as the positive ones. There are only a few Commission proposals in which exchanges are possible without negative externalities. This suggests why the position exchange model is unable to improve significantly on the predictive accuracy of the compromise model in the present application. We expect that exchange possibilities without negative externalities are more easily realised than those that have large negative effects on the utility of other actors. When exchange possibilities have high negative externalities, these bilateral exchanges will be discouraged. They will be seen as serving the *parochial interests of the two exchange partners*, rather than *contributing to a constructive common solution*. This also implies that exchanges are not the primary solution for resolving controversies in legislative decision-making in the European Union. Consequently, the position exchange model is not the best model to predict outcomes in this context.

When applying multilevel regression with two levels (proposals and issues, and gains defined at the proposal level), we encountered many estimation problems. We therefore report two statistical analyses. The first is a regression of the errors of the exchange model on the issues from Commission proposals with only two controversial issues (see Table 8). These errors are regressed on the ‘own gains’ and the negative externalities present in those proposals. Table 8 shows that high ‘own gains’ improve the predictions of the exchange model, but that negative externalities do not matter. Neither of the effects is statistically significant. The second analysis is an OLS regression at the issue level over all proposals to give at least some indication of the statistical effects (Table 9). The coefficients in Table 9 indicate that high negative externalities indeed increase the errors of the position exchange model. This effect is just statistically

significant at the 10 percent level. Own gains matter less (and the small effect is in the direction opposite to that expected).

As for the other results from the regressions, there are three important sets of findings. First, the reported differences in errors between the different legislative procedures do not result in significant effects of the co-decision and unanimity dummies. Second, with regard to the distinction between dichotomous, rank order and scale issues, the compromise model is most sensitive to the measurement level of the issue continua, while the exchange model is least sensitive. Third, the higher the polarisation in the positions, the more accurate are the predictions of the exchange model.¹⁷ For the other two models the reverse is true, although we expected that the challenge model would do better on polarised issues. The good performance of the exchange model on dichotomous and polarised issues can be explained by the fact that exchanges of extreme positions yield the highest utility gains.

Table 8: Effects of own gains and negative externalities on error of exchange model for proposals with two controversial issues (n=46)

	B	Std. Error	t	Sig.
(Constant)	26.921	4.535	5.936	.000
Own gains	-135.548	99.304	-1.365	.179
Negative externalities	8.815E-02	7.153	.012	.990
Adj. R Square .005				

¹⁷ We have measured the polarisation of the positions on each issue by the average distance between each actors' position and the prediction of the compromise model, whereby the distances were weighted by the product of the actors' capabilities and the level of salience they attached to the issue.

Table 9: OLS Regression analysis of the errors of the models (standard error in parentheses)

	Compromise Model (SSI2)	Exchange model (SSI 2)	Challenge or Expected Utility Model (SSI 2)
Constant	24.55*** (6.13)	19.39*** (6.03)	25.22 *** (8.63)
No of (pairs of) issues			
No. of issues	.82 (1.26)		.14 (1.78)
No. of pairs of issues		1.48 (1.03)	
Legislative Procedure			
Co-decision	2.43 (3.13)	-1.47 (3.77)	-1.87 (4.40)
Unanimity	-4.29 (3.48)	-3.06 (3.90)	-2.47 (4.89)
Issues			
Rank	-16.12*** (4.05)	-5.18 (4.50)	-10.64* (5.7)
Scale	-17.00*** (5.76)	-8.02 (6.64)	-11.59 (8.1)
Polarization	.10*** (.03)	-0.06* (0.035)	0.136*** (0.04)
Externalities			
Own		19.7 (32.75)	
Total negative		1.97* (1.19)	
Adj. R-sq	.17	.09	.07
F	6.32***	2.68***	2.8**
N	154	137	154

* Significant at .10 level; ** Significant at .05 level; *** Significant at .01 level

6. Conclusion

In this paper we applied models in which actors attempt to build coalitions behind or close to their positions. According to these models, actors are willing or feel compelled to change their positions during the stage of informal bargaining before decisions are formally adopted. Three processes through which actors might reach agreement were distinguished. If actors' common interests are high relative to their divergent interests (as reflected in their positions and saliences on the issues), actors may change their initial positions on the basis of convincing information and persuasion by others. The compromise model represents this process. The exchange and challenge models take the initial positions as given and fixed, but assume that actors might be willing or forced to support other positions at the final voting stage. The exchange model assumes that shifts in actors' positions result from pairs of actors taking advantage of mutually profitable exchange opportunities across pairs of issues. Such exchange opportunities are present when actors have opposing positions on both issues, and attach different relative levels of salience to the issues. Both actors involved in the exchange stand to gain relative to the outcome if the compromise model were applied to the initial positions. While exchanges have positive effects on the utilities of the actors that execute them, they may have serious positive or negative externalities for other actors. Finally, the challenge model is based on non-cooperative processes, through which some actors are compelled or persuaded to change their voting positions due to challenges from others.

The first conclusion to be drawn from these analyses is that the more complex challenge and the exchange models do not improve on the accuracy of the compromise model's predictions. On all issues in the data set to which we applied the models, the average error of the exchange model is 25.2 points while the challenge model has an error term of 28.8. The compromise model improves on both models, with an error of 23.5. So what has changed since the previous study of Bueno de Mesquita and Stokman (eds. 1994), in which the challenge model was found to be the best predictor of decision outcomes? The previous study contained an analysis of 22 issues, and most of the statistical analyses were performed on just 16 issues. In the present analysis, 154 issues have been included. This could make a difference. Furthermore, the analysis performed for

the 1994 book included a smaller number of actors; then, there were only twelve Council members, and the analysis excluded the Commission and the EP. The current analysis includes fifteen member states, the Commission and the EP. A larger number of actors makes the decision-making process more complex, which makes it more difficult for the bargaining models to predict accurately.

A second important finding is that bilateral exchanges between pairs of actors tend to induce large externalities for other actors in the European Union. The negative externalities are about twice as large as the positive ones, and much larger than the utility gains expected by the potential exchange partners. When this is the case, exchanges between pairs of actors will be seen as serving parochial interests, rather than contributing to common solutions that would be acceptable to all actors. Negative externalities are present in almost all Commission proposals in the dataset. Despite the apparent inapplicability of the exchange model, it does generate more accurate forecasts than the challenge model. This is true in terms of the overall performance of the models, and also within most of the subsets of issues we investigated. Furthermore, the exchange model's forecasts do not appear to be statistically worse than those of the compromise model. Given that bargaining in the EU involves repeated interaction between the same players, it is plausible that *models based on cooperative assumptions are more applicable* than the challenge model, based on a non-cooperative assumptions.

Thirdly, the bivariate analyses suggested that the accuracy of the three models varied across legislative procedures. Under the consultation procedure (both QMV and unanimity voting in the Council) the compromise model generated the most accurate predictions, while under the co-decision procedure (both QMV and unanimity) the exchange model performed best. In the multivariate analyses these effects disappeared, however.

The main conclusion to be drawn from this research is that the results support the prevalence of cooperative mechanisms in the EU decision making and, in particular, the compromise model. This gives credence to the view that legislative decision-making in the European Union is based on mechanisms and processes in which information and persuasion are central, and in which actors are willing to compromise for the sake of reaching common solutions. Cooperative mechanisms are more important than non-cooperative mechanisms during the decision making process of the EU. However, while

the exchange and the challenge models provide an account of the actor level process by which choices are made, the compromise model does not. Furthermore, the differences in predictive power among the three models are very small compared to the standard errors. Therefore, it can be concluded that each of these models incorporates some aspects of the reality of EU decision-making that the other two models miss.

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