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Chapter 5 Compromise, exchange and challenge in the European Union

Javier Arregui, Frans Stokman and Robert Thomson

August 4th, 2003

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1 - Introduction

According to the account of European Union (EU) decision making proposed in this chapter, this is a bargaining process during which actors shift their policy positions with a view to reaching agreements on controversial issues. Formal institutions, such as the procedural rules explored in Chapter 3, matter in this process. They influence the set of actors included in the process and their relative weight or power. 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 chapter, we compare two main models of the bargaining process that leads to shifts in actors' initially most favoured positions.

The models we focus on in this chapter are the position 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 position exchange model, for instance, 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 instance, 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 position exchange model presented here, actors do not consider the full implications of their influence strategies on other actors, who are not the target of their influence attempts. This is the subject of our discussion on 'externalities' that we will turn to later (Section 2.3).

The focus on the informal means through which actors exert influence is what distinguishes the bargaining approach to explaining decision making from some of the other approaches adopted in this book. Much of the best known literature on legislative decision making in the EU focuses on the formal procedural rules laid down in the

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. For more details of this dossier see the illustration in Chapter 6 by Bailer and Schneider.

Treaties (see Chapter 3 by Steunenberg and Selck, and the references therein). According to our conception of decision making, formal decision making rules still matter, but in ways different to those supposed in procedural models. First, these procedures partly define the capabilities actors can deploy during the execution of their influence attempts. These capabilities are exogenous to the bargaining models considered here. The bargaining approach focuses on how these capabilities are deployed through the particular modes of interaction between actors: the use of *exchanges* or *challenges* through which actors' initial positions are transformed into voting positions in the final voting stage. Second, formal procedures determine the voting rule and actors' weights in the final voting stage in which the actors' final positions, possibly after being influenced by other actors, are transformed into collective decision outcomes.

The research approach adopted in the present chapter is one that was used in a previous study of European level decision making. Bueno de Mesquita and Stokman (eds. 1994) applied these bargaining models to decision making in the Council of Ministers of the European Community. That volume 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'² (ibid.: 225). It was not, however, possible to distinguish between the alternative models statistically, nor to investigate the conditions under which they might produce more or less accurate forecasts. We aim to do so in the present chapter. Further, we now have a better theoretical foundation for the compromise and position exchange models, and are able to derive and compute the externalities of bilateral exchanges. Finally, this chapter also includes the analysis of a much larger number of issues and more actors, including the Commission and the European Parliament.

In other decision situations, researchers have applied this approach to make inferences on the prevailing modes of interaction between political actors. For example, the position exchange model was applied to the analysis of decision making on the European Union's Structural Funds in Ireland (Payne 1999; Mokken et al 2000). The challenge model has been extensively applied within the field of international relations. An overview of the applications of the Bueno de Mesquita's challenge model can be found in Ray and Willer (1993; see also Thomson, Torenvlied and Stokman eds. 2003). The position exchange model has also been applied to other decision situations: for example, in local authority decision making in the Amsterdam City Council (Berveling 1994), and, together with the challenge model, to negotiations between employers and trade unions (Rojer 1999). Similarly, on the basis of the accuracy of the models' forecasts of decision outcomes, we make inferences about the relevance of the influence strategies they posit.

² 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 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'.

In Section 2 we describe the alternative models. This also includes a discussion of the compromise model, elaborated by Christopher Achen in Chapter 4. This discussion is important because the compromise model is a component part of the position 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 a few aspects of the research design not covered by the general discussion in Chapter 2. 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 position exchange model and our interpretation of the compromise model. The final part of this section considers some conditions under which each of the models might be more or less applicable.

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 positions³, 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 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

³ 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.

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.

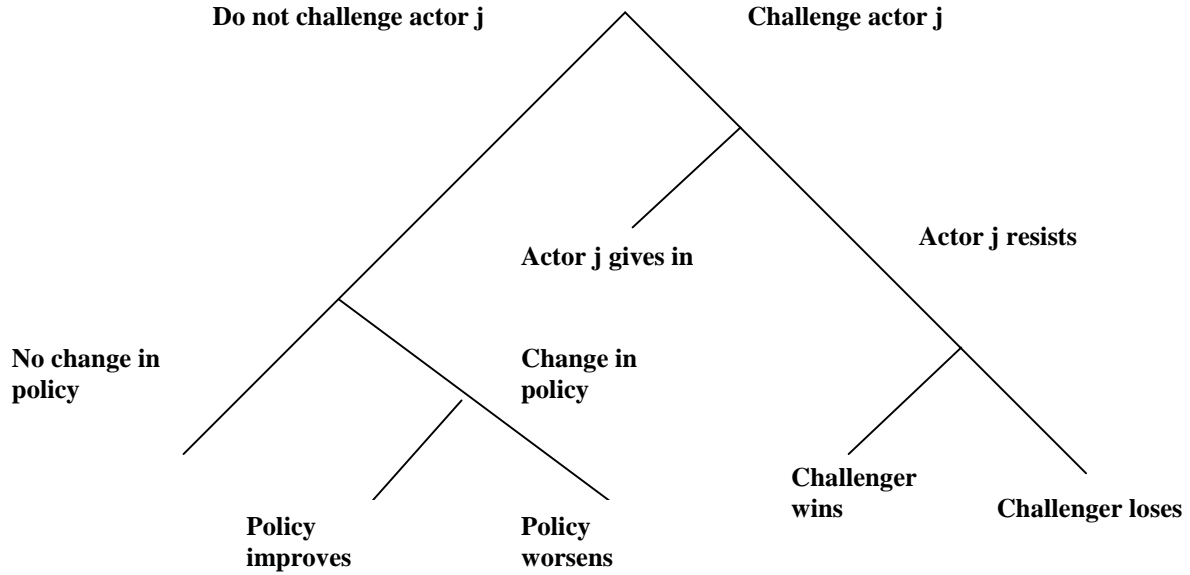
The expected utility for i of challenging j is computed as follows. The likelihood that actor j will resist a challenge by i is estimated by the salience actor j attaches to issue a , denoted by s_{ja} . The likelihood that actor j will give in is equal to $(1 - s_{ja})$. In the latter case, actor j 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 $u^i \Delta x_{ja}^o$. The expected utility of not challenging another actor, j , is then simply:

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

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.⁴ 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 position exchange model

According to the position 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 position exchange model is therefore a cooperative model of political bargaining.

The compromise model introduced by Christopher Achen in Chapter 4 is essential to understanding the workings of the position exchange model. Recall that 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 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 position 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

⁴ 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. Applying the procedural models featured in Chapter 3 to these final positions would be possible candidates. In their present form, however, these procedural models generate predictions on the basis of the assumption that there are no shifts in positions after the agenda setter introduces its proposal. The procedural models could be reformulated so that the actors vote on the agenda setter's proposal, not on the basis of their initial positions, but on the basis of their voting positions. If such a model were to generate more accurate predictions than current procedural models, this would be evidence that informal bargaining is an important part of the process that takes place between the introduction of the proposal and the formal adoption of the legislation.

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; 1999; 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 ones⁵; in the position exchange model, actors find expedient to shift policy positions.

In Chapter 4, Christopher Achen showed 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 position exchange model, we connect a cooperative position exchange model with a cooperative influence model. The position 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

⁵Note 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

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.

According to Arrow's theorem (1951), there are many decision situations in which transitive individual preferences cannot be aggregated to produce collective equilibrium outcomes. In the case of the position exchange model, this means that bilateral exchanges of voting positions can produce outcomes that are sub-optimal for other actors that are not involved in the exchange. When pairs of actors exchange voting positions, this can produce negative externalities for other actors on those issues in which they exchange voting positions. Therefore, there will be cases in which the position exchange model does not provide the most optimal solution for the whole set of actors. We will explore this possibility further in our discussion of externalities.

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 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.⁶ 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.

When the position 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.⁷ 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.

2.3 - Conditions favouring compromise, exchange and challenge

The compromise model and the challenge model represent contrasting influence processes. When the conditions favour the search for compromise, we would expect the challenge model to be less relevant. The compromise model's connection with information based influence processes implies that the compromise solution might be the preferred solution when an issue is less polarised. In such a situation, we would expect divergent interests to be accommodated in favour of the common interests. The polarisation of an issue depends not only on the distribution of the positions, but also on the location of actors with high capabilities that attach great importance to the issue. We operationalise issue polarisation as the average distance between actors' initial positions and the expected outcome (as defined by the forecast of the compromise model), whereby these distances are weighted by the product of actors' capabilities and the level of salience they attach to the issue. Issues are less polarised if the effective power is concentrated around a particular point on the issue scale. While we expect the compromise model to perform well on issues of low polarisation, the challenge model is expected to perform poorly in such situations.

⁶ 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.

⁷ 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.

The effects of exchanges in terms of the benefits or losses that accrue to actors not directly involved in the exchange are referred to as externalities. Such externalities may encourage or discourage the realisation of exchanges. Equation 4 makes it possible to measure directly whether exchanges of voting positions result in better or worse outcomes for actors than the compromise solution. Because issues are combined with each other, it is possible that all actors might be better off supporting a decision outcome other than the compromise model's solution on two issues. The consequences of all exchanges on any combination of two issues for actor *a* can be divided into three components. First, the utility gain as a consequence of actor *a*'s *own exchanges*. Since actors only engage in exchanges in which they gain, this component has to be positive. The second component consists of changes in utility experienced by actor *a* resulting from *exchanges in the own group*. If, for example, actor *a* is a member of a *G1* (see Figure 2) exchanges between all other *G1* and all *G4* actors feature in this component. This component could either be positive or negative, depending on the direction of the exchanges realised by the other *G1* and *G4* actors. The third component consists of changes in actor *a*'s utility following *exchanges in the other group*. The 'other group' of an actor contains all other stakeholders: for example, for a *G1* actor, all actors of type *G2* and *G3*. Utility changes as a result of exchanges between other actors represent externalities. Negative externalities (negative utilities) signal conflict. Therefore, the sum of utilities resulting from exchanges in the other group and from exchanges in the own group are denoted by measures of *between group conflict* and *within group conflict* respectively (Van Assen et al 2003).

We assume that exchanges of voting positions are more likely in Commission proposals, the higher the utility gains of the own exchanges, the higher the positive externalities, and the lower the negative externalities. Bilateral exchanges between actors promote common interests if they have positive externalities. Bilateral exchanges with negative externalities promote parochial interests, and may well endanger the process of finding common solutions. Sometimes, negative externalities are unavoidable. This is the case if all four cells in Figure 2 are filled. *G1-G4* exchanges then have positive externalities for *G2* and negative for *G3*, if issue *a* is the demand issue for actors in *G1* and issue *b* the demand issue for actors in *G4*. Exchanges can have negative externalities within an actor's own group if the priorities within the own group differ. In that case, for example, issue *a* may be the demand issue for one stakeholder in *G1* and supply issue for another.

Table 1: Summary of models applied and their required input variables

Model	Prediction	Input data
Challenge model	Iterative bargaining model based on non-cooperative game theory that models challenges of positions	Positions of the actors, the levels of salience they attach to issues and their relative capabilities
Position exchange model	Bargaining model based on cooperative game theory that models exchanges between pairs of actors across pairs of issues	

3 – Research Design

Most of the research design decisions have been discussed in Chapter 2. Here, we simply report on the measure of actors' capabilities used in this application, and on the selection of issues for inclusion in our analyses.

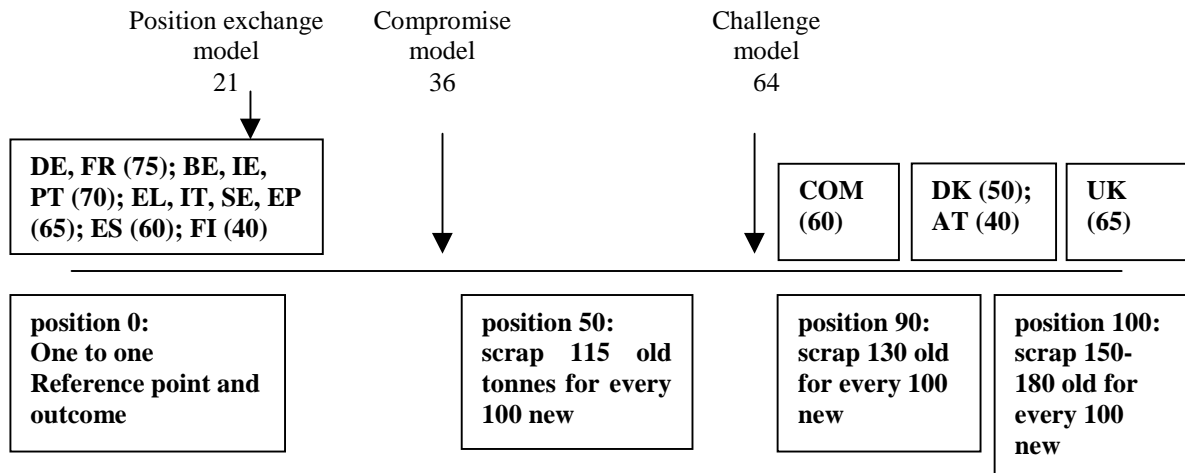
We report the results of the analyses based on the second variant of the Shapley Shubik Index scores described in Table 5 of Chapter 2. According to these scores, the Commission does not feature in the co-decision issues; the bargaining takes place between the Council members and the European Parliament. 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 described in Chapter 2, 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 position 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 position 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?

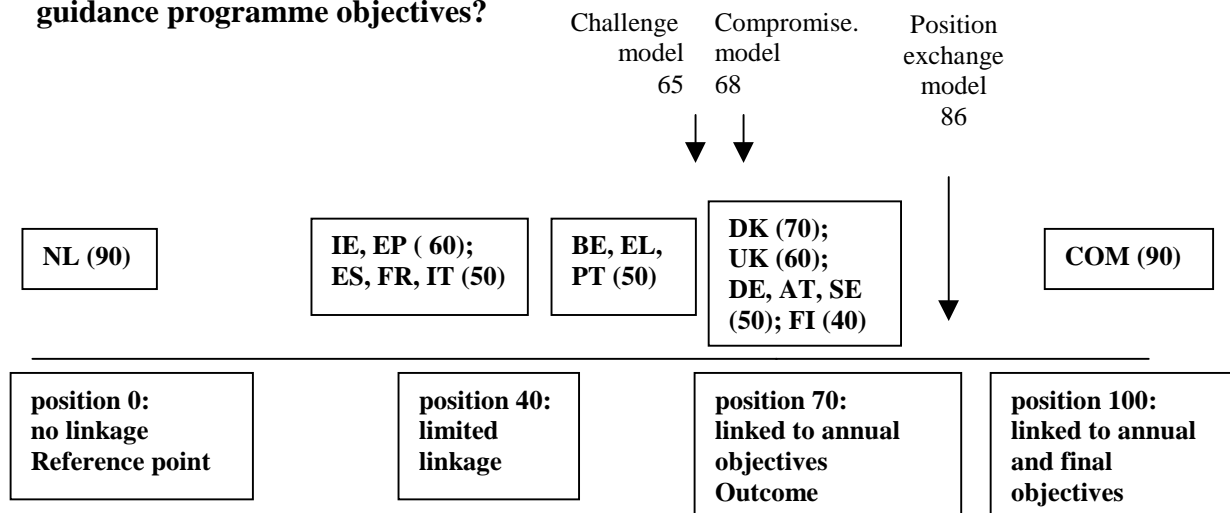


Figure 3 : Illustration of model predictions on Commission Proposal for a Council Regulation laying down the detailed rules and arrangements regarding the Community structural assistance in the fisheries sector (CNS/1998/347). Salience scores in parentheses.

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 position 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 (DE, FI and SE) 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	BE, ES, EL, FR, IT, IE, PT, EP	DE, FI, SE
	Right	None	COM, AT, 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.⁸ 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 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 position exchange models' predictions on issue one makes clear. The position 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.

⁸ 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.

5- Analysis

Which model generates the most accurate forecasts of decision outcomes in the EU?⁹ 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 position 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.¹⁰

Table 3 : Summary of error of models on issues¹¹

Model	Error of models on all issues
Compromise model	23.48 (n=154)
Position 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 Chapter 2.

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 position 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 issues¹²

	Dichotomous	Rank order	Scale
Compromise model	38.10 (n = 26)	21.02 (n =109)	17.61 (n = 19)
Position 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)

⁹ Note that our models can be tested in two different ways. First, as in the present chapter, 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 appears on a forthcoming special issue of European Union Politics.

¹⁰ 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.

¹¹ 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).

¹² 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 position 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 position exchange model generates the most accurate forecasts.

Table 5: Summary of error of models on issues by legislative procedure¹³

	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)
Position 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 position 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.

Table 6: Summary of error of models on issues by policy areas¹⁴

	Agriculture	Internal Market	Other policy areas
Compromise model	26.61 (n=40)	31.28 (n=34)	18.61 (n=80)
Position 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. As discussed earlier, 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

¹³ 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 position 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.

¹⁴ 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 position 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.

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

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 losses over all exchanges within such a proposal. Table 7 provides these figures for the 49 Commission proposals to which the position 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.

Our expectation is that the position exchange model works primarily in exchange situations without (large) negative externalities. However, we are unlikely to find strong statistical effects in our subset of issues with high negative externalities, due to local stochastic independence. In addition, we face a second statistical problem (see Table 8). The size of the gains is expected to depend strongly on the number of pairs of issues in a Commission proposal. The correlations in Table 8 show that the sizes of the gains and losses indeed correlate very highly with the number of (pairs of) issues. The correlations between the own gains and the positive and negative externalities are also very high. We therefore face a serious problem of multicollinearity. This cannot be solved by multilevel

regression analysis as we are dealing with three levels (proposals, issues and pairs of issues) of which the lowest level (pairs of issues) is not nested in the higher levels. 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 position exchange model on the issues from Commission proposals with only two controversial issues (see Table 9). These errors are regressed on the ‘own gains’ and the negative externalities present in those proposals. Table 9 shows that high ‘own gains’ improve the predictions of the position 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 10). The coefficients in Table 10 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). Externalities had no effect on the errors of the compromise and challenge models. We did not include these effects in the reported regression analyses for those models.

Table 8: Product moment correlations between utility gains and number of (pairs of) issues

	Own gains	Negative externalities	Positive externalities	Total gains and losses	No of Issues	No of pairs of issues
		s	s			
Own gains	1	-.612**	.738**	-.265	.873**	.858**
Negative externalities	-.612**	1	-.747**	.855**	-.637**	-.598**
Positive externalities	.738**	-.747**	1	-.299*	.700**	.701**
Total gains and losses	-.265	.855**	-.299*	1	-.340*	-.286*
No of Issues	.873**	-.637**	.700**	-.340*	1	.951**
No of pairs of issues	.858**	-.598**	.701**	-.286*	.951**	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

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 position exchange model is least sensitive. Third, the higher the polarisation in

the positions, the more accurate are the predictions of the position exchange model.¹⁵ 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 position exchange model on dichotomous and polarised issues can be explained by the fact that exchanges of extreme positions yield the highest utility gains.

Table 9: Effects of own gains and negative externalities on error of position 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				

Table 10: OLS Regression analysis of the errors of the models (standard error in parentheses)

	Compromise Model (SSI2)	Position 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

¹⁵ Recall, we measured the polarisation of the positions on each issue by the average distance between each actor's 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.

6- Conclusions

In this chapter 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 introduced in Chapter 4 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 position 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 position 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 position 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. Thus, computational sophistication is no guarantee of accuracy. 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. This makes it difficult to test whether the position exchange model generates more accurate predictions when there are low negative externalities (the problem of local stochastic independence). Despite the apparent inapplicability of the position 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 position 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.

The third conclusion is that we have made some progress in specifying the conditions under which the three models are more or less applicable. The position exchange model is the only model that is insensitive to the level of measurement of the issues. Moreover, its predictions are more accurate when the issues are more polarised. The position exchange model's predictions improve slightly when the negative externalities from exchange are lower. The other two models perform worse on issues that are highly polarised. The compromise model is particularly sensitive to the level at which the issues are measured, and generates poor predictions on dichotomous issues. 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 position exchange model performed best. In the multivariate analyses these effects disappeared, however.

The main conclusion to be drawn from this chapter is that the results support to some extent to the compromise model. This gives credence to the view that legislative decision making in the European Union is based on processes in which information and persuasion are central, and in which actors are willing to compromise for the sake of reaching common solutions. 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, as we have shown in Section 5, 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 European Union decision making that the other two models miss.

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