

Trading Portfolios: The Stability of Coalition Governments

Betul Demirkaya

Norman Schofield

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Introduction

In many parliamentary systems, it is quite often the case that a single party fails to win the majority of the seats and, consequently, governments are formed by two or more parties. The interrelated topics of the formation and the stability of coalition governments have been extensively studied both theoretically and empirically in the political science literature. Several studies address the questions of who enter coalition governments, and how ministries are distributed among the coalition partners. The answers to these questions fall along two lines: Spatial models focus on the ideological position of parties while portfolio allocation models treat ministries as benefits to be shared by the parties in the government.

The existing literature provides compelling arguments that explain the number and the characteristics of parties that form coalition governments as well as how they share ministries. Most studies assume, however, that all parties have similar emphasis on different policy areas. From previous work, we know that this assumption is not accurate. In particular, there are niche parties that are distinguished from the mainstream ones by the issues that they have on their agenda. Instead of placing themselves on the existing ideological spectrum, these parties emphasize one or a few issues that are not discussed by the mainstream parties (Meguid 2005). Since these parties appeal to their constituency on the basis of these issues, we would expect them to be more interested in the ministries that are related. For instance, the ministry of environment would be more valuable for an environmentalist party than it is for a mainstream party.

In this paper, we explore the question of how the inclusion of a niche party influences the allocation of ministries in coalition governments. In particular, we ask whether niche parties have an advantage because of higher values that they place on certain ministries that the other parties are less interested in. Following the literature on portfolio allocation, we assume that parties try to maximize their payoffs from the ministries that they receive in the

coalition. We allow the possibility that some parties value certain ministries more than other parties do. This is because parties would receive more payoff from the ministries related to the issues that are salient for their constituency. If a party is not concerned with a certain issue, it may be more willing to give up the related ministry. In what follows, we provide a simple model where two parties are dividing a portfolio of three ministries. We limit our attention to stable coalitions and compare the stable coalitions formed by two mainstream parties with those formed by a mainstream party and a niche party.

Literature

The questions regarding the composition of coalition governments relate to the size of the coalition and the characteristics of the parties in the coalition. In his seminal theoretical work on the size of coalitions, Riker (1962) argues that the number of parties in the coalition is determined by the minimum number of parties that is sufficient to form the coalition. The number of oversized coalitions that we observe gives us sufficient reason to doubt the completeness of Riker's argument, referred to as the size principle. The size principle was later complemented to incorporate the ideological position of parties. Accordingly, the expectation is minimum connected winning coalitions, that is, coalitions formed by parties that are next to each other on the ideological spectrum, and have sufficient number of seats to form the government. The implication of this argument is that we can observe oversized coalitions whenever a small party is placed ideologically between parties that have sufficient seats to form the government (Axelrod 1970). Another explanation for oversized coalitions is provided by Groseclose and Snyder (1996), who argue that minimal winning coalitions may be more costly than supermajority coalitions because in the latter, it is harder for the outsiders to form an alternative coalition. Volden and Carubba (2004) empirically test the arguments on the size of coalitions and find out that oversized coalitions are more likely to be formed in ideologically diverse legislatures and when passing bills is hard. They explain this by the tendency of parties in the coalition to engage in logrolling. In our model, we will limit our attention to minimal winning coalitions; however, it is worth exploring how ministries are distributed if oversized coalitions are formed in future work.

Laver and Shepsle (1996) provide a spatial analysis of the stability of coalition governments, which brings together the questions of which parties enter coalition governments and how ministries are distributed among these parties. In their model, the relative position of parties in two policy dimensions are taken into consideration. The coalition is more likely to be stable when ministries are given to the parties that have the median position in the respective policy dimensions. In this model, parties are not concerned only with maximiz-

ing the number of ministries that they receive from a coalition. Instead, they try to enter coalitions with parties closer to their ideological positions because they care about both policy dimensions. Therefore, parties that have the median position have a stronger hand in bargaining than extreme ones. In the extreme case, if the majority of the parties prefer to give all ministries to a certain party because of ideological proximity, this party, referred to as “very strong party” can form a minority government. Martin and Stevenson (2001) find empirical support for this argument that the ideological proximity of parties to other potential coalition partners makes it more likely that they enter a coalition. Along similar lines, Martin and Vanberg (2003) show that coalition negotiations take longer when parties are ideologically distant from each other. In this paper, we will set aside the ideological positions of coalition partners and focus on the weight that they place on different issues. Hence, the distinction we make between parties is not based on a placement of parties on a single ideological space but it is a matter of emphasis on different dimensions or issues.¹ Hence, our analysis is more akin to the models of portfolio allocation than on spatial models.

Gamson (1961)’s theory of coalition formation underpins the extensive literature on the question of portfolio allocation in coalition governments. According to the main hypothesis of the theory, “any participant will expect others to demand from a coalition a share of the payoff proportional to the amount of resources which the contribute to a coalition.” (p.376) Therefore, any participant would prefer to form the “cheapest winning coalition”, that is the coalition in which her share of the resources in the coalition is as large as possible. The application Gamson’s theory to formation of coalition governments led to the following hypothesis, which was supported by several empirical studies.² The number of ministries allocated to each party is expected to be proportional to its seat share in the parliament. More recent work incorporated the importance of ministries into their analyses as well. Warwick and Druckman (2001) argue that the number of ministries is not sufficient to assess the relative payoffs of coalition partners but the salience of ministries is equally important. In their later work, they use an expert survey to evaluate the value of different ministries. When the payoffs of parties are weighed according to the importance of ministries, the proportionality hypothesis continues to hold (Warwick and Druckman 2006). Warwick and Druckman’s contribution is important in pointing out the variance in the salience of ministries; however, they assume that the weights placed on ministries will be the same across parties. The main contribution of our model is to relax this assumption and discuss its effects on portfolio allocation.

The hypothesis on proportionality has been important in shaping the literature on portfo-

¹This is along the lines of Meguid (2005)’s definition of niche parties.

²See, for example, Browne and Franklin 1973, Schofield and Laver 1985.

lio allocation. It is important to note, however, that the hypothesis states the demands of the coalition partners rather than the distribution of payoffs as a result of a bargaining process. As it does not take into account the relative bargaining power of players, it contradicts with the main results of theoretical literature on bargaining. In the alternating offer bargaining model of Baron and Ferejohn (1989), the player that is recognized as the proposer receives a payoff that is significantly larger than her share of votes. Based on this model, Snyder et al. (2005) point out that in an alternating offer bargaining model where recognition probability is proportional to voting weight, the expected payoff for players with small voting weight is disproportionately larger. These models imply that the formateur would have receive a disproportionate share of the ministries in coalition governments.

In order to bridge the gap between the well-supported empirical regularity based on Gamson's hypothesis and the theoretical expectation of Baron and Ferejohn model, Morelli (1999) offers a model of demand competition. In this model, bargaining takes place as a sequence of demands made by all the players, and the order of play is determined by the proposer. Unlike the Baron and Ferejohn model, the proposer does not receive a disproportionate share of payoffs in the demand competition model. The distribution of payoffs in equilibrium is in fact very similar to the Gamson's hypothesis with an important difference. What determines the distribution of payoffs is not the vote share of the players per se but their bargaining power defined in terms of the number of winning coalitions that a party can participate. For example, consider a bargaining game in which the votes shares of the three players are 49, 49, and 2, and the decision is made with majority rule. Since none of the players has the majority and any two player can form a coalition, all three players have equal bargaining power. Thus this model questions the use of seat share in the parliament as the explanatory variable for portfolio allocation.³

In another recent attempt at accounting for the discrepancies between theoretical and empirical literature on coalition formation, Bassi (2013) models the recognition of the proposer as an endogenous process. In her model, parties bargain over being the formatter before they negotiate over portfolios. As a result, the formateur loses her advantage in the distribution of ministries because she needs the support of other parties to be recognized as the formateur. When the preferences of parties over ministries are the same, this model leads to the same distribution of resources as Gamson's hypothesis. When some parties value some ministries more than others, the proportionality is not perfect because proportional distributions may not be Pareto-efficient. Bassi's model is important in incorporating the fact that different parties emphasize different policy areas in the study of formation of coali-

³For a comparison of Gamson's hypothesis, Baron and Ferejohn model, and demand competition model in an experimental setting see Frechette et al. 2005.

tion governments. In this paper, we also place emphasis on this fact; however, the focus of our model is on the stability of coalition governments.

While there is ample empirical support for the proportionality hypothesis, many studies also point out to its restrictions. In particular, it was argued that small parties may acquire a disproportionate number of ministries. Browne and Franklin (1973) find that while the proportionality holds for larger coalition partners, the situation for small coalition partners is different. When the number of parties in the coalition is small, small partners receive more than their seat share. This relationship is reversed as the size of coalitions increases. Schofield and Laver (1985)'s analysis shows that Gamson's hypothesis is a good predictor in countries such as Austrian and Germany where there are fewer parties in the political system, and where governments are formed on the basis of ideology and last longer. Similarly, Verzichelli (2008) shows that disproportionality is observed in fragmented political systems. He also points out that the number of the ministries is not fixed and may change over time depending on the negotiations among coalition partners. Ansolabehere et al. (2005) use a measure of bargaining power instead of seat shares to predict the allocation of ministries. They show that when bargaining power is used instead of seat share, there is a substantial advantage of being the formateur; however, this advantage is not as large as that would be predicted by the Baron and Ferejohn model. In addition, smaller parties have higher payoffs than predicted by the model.

Stability of Coalitions

The discussion on the stability of coalitions is not divorced from the one on the formation of coalitions. The setup for the stability concepts implicitly relies on a bargaining environment where the players can communicate with each other. The idea of stability is based on the satisfaction of all coalition partners with their payoffs from the coalition. If we expect a coalition to last, the players that are involved in the coalition should not be able to receive better payoffs elsewhere. The goal is to come up with the range of self-reinforcing coalitions in the absence of an outside enforcement mechanism. From the perspective of political parties, it is more reasonable to enter into coalitions that will last given that there is nothing that precludes their partners to leave the coalition and cooperate with other parties. Hence, it is reasonable to expect some stability and the notions of stability that will be discussed below would be helpful in making predictions about the coalitions that are more likely to be formed.

Aumann and Maschler (1964) introduce the notion of M_1 bargaining set to identify the set of stable coalitions that may result from bargaining. The basic idea behind this notion

is the following: A coalition member that is not satisfied with her payoff from the coalition may threaten her individual coalition partners with getting into a coalition in which she can receive a higher payoff and give enough payoff to all members of the new coalition. This threat will not be very strong if the threatened coalition partner can also come up with an alternative coalition in which she can maintain her payoff from the original coalition and give enough payoff to all the members of the new coalition. A coalition will be stable only if it is safe from all the strong threats by each member of the coalition against each other member. M_1 bargaining set was proved to be nonempty for cooperative games (Peleg 1963). While M_1 bargaining set proved to be a useful notion to think about stability of coalition governments, Schofield (1978) points out that it includes counterintuitive outcomes where the payoffs are distributed inequitably. Therefore, he defines another solution concept M_2 , which is a subset of M_1 bargaining set. The difference of the M_2 bargaining set is that it includes coalitions in which not only individuals but groups in the coalition are safe from threats. This narrower set excludes those coalitions with unequal distribution of payoffs among coalition members. The formal definitions of $M_1 - \text{stable}$ and $M_2 - \text{stable}$ coalitions are below:

Let (M, x) be a winning coalition defined by a set M of players and a vector x of payoffs assigned to each player. Let x_i denote the payoff that player i receives from coalition (M, x) . Assume $x_i = 0$ for all $i \notin M$, and $x_i \geq 0$ for all $i \in M$.

Definition 1: Let j and k be players in coalition M .

An *objection* by player j against individual k with respect to coalition (M, x) is a winning coalition (N, y) such that

$$k \notin N$$

$$y_j > x_j$$

$$y_i \geq x_i \text{ for all } i \in N$$

A *counter objection* by player k against player j 's objection is a winning coalition (P, z) such that

$$j \notin P$$

$$z_k \geq x_k$$

$$z_i \geq y_i \text{ for all } i \in P$$

Definition 2: Let $K \subset M$ be a group of players in coalition M such that $j \notin K$.

An *objection* by player j against group K with respect to coalition (M, x) is a winning coalition (N, y) such that

$i \notin N$ for all $i \in K$

$y_j > x_j$

$y_i \geq x_i$ for all $i \in N$

A *counter objection* by group K against player j 's objection is a winning coalition (P, z) such that

$j \notin P$

$z_i \geq x_i$ for all $i \in K$

$z_i \geq y_i$ for all $i \in P$

Definition 3:

A coalition (M, x) is $M_1 - stable$ if to any objection against an individual k , the individual k can respond with a counter objection.

A coalition (M, x) is $M_2 - stable$ if to any objection against a group K , the group K can respond with a counter objection.

M_2 bargaining set produced useful results that substantiate the discussions on portfolio allocation. It will be helpful to discuss these results separately for two different types of games. In games with transferable value, the minimal winning coalition has a value, which is then distributed among coalition partners. As the number of partners increase the total value of the coalition increases at a decreasing rate. In these games, if the M_2 bargaining set exists, it only includes symmetric (equal) distribution of payoffs (Schofield 1978). In log rolling games, each player receives positive payoff from her favorite bill, and negative payoff from any other bill. There are no players that have the same bill as their favorite bills. In these games, the M_2 bargaining set exists and it only includes those coalitions where each partner in the coalition gets the bill she wants and the outsiders get nothing (Schofield 1980). These findings provide theoretical justification for Riker's size principle. Empirical tests show that bargaining set provides a good predictor of portfolio allocation in fragmented political systems, in which the proportionality hypothesis fails (Schofield and Laver 1985).

The problem of portfolio allocation that we are interested in this paper is different from the transferable value games. The total value of the coalition is not determined only by the number of the parties included in the coalition. When the players assign different values to ministries, a coalition with the same players may have a different total value depending on how the ministries are allocated to the players. Hence, the pie to be divided in the question is not uniform but some players value certain slices more than other players do. Obviously, in order to maximize the total value of the coalition, the ministries should be given to the parties that value them the most. In this case, if there is a party that values a ministry that

is not valued a lot by the other parties, we may expect it to be a desirable coalition partner because it would be cheaper to include that party in the coalition.

Model

There are three parties – A , B , and C – that can form a coalition government. Each party has one vote and forming a coalition requires two votes. The cabinet consists of three ministries. Each party assigns a value to each ministry. The values assigned to ministries are denoted by the vector $v_i = (v_{i1}, v_{i2}, v_{i3})$ where v_{ij} refers to the value that party i assigns to ministry j . We standardize the total value of having all three ministries to 100 for each of the parties, that is, $v_{i1} + v_{i2} + v_{i3} = 100$ for all i . Each coalition is an allocation of the three ministries to the parties in the coalition. We assume that any party in the coalition will get at least one ministry⁴ and we denote coalitions by an ordered triple that shows which ministries are allocated to which parties. For example, AAB refers to a coalition where party A gets the first two ministries, and party B gets the third ministry. Party i 's payoff from coalition M , denoted by $u_i(M)$, is the sum of values the party assigns to the ministries that it gets under that coalition. For example, $u_A(AAB) = v_{A1} + v_{A2}$.

We apply the solution concept of M_2 – *stability* in a portfolio allocation problem, in which we allow players to value ministries differently. In particular, we are interested in the question of which two-party coalitions are M_2 – *stable* in the following two cases:⁵

Case 1: All three parties have the same preferences about the ministries, that is, $v_A = v_B = v_C = (a, b, c)$. Without loss of generality, we assume that $a > b > c > 0$. Hence, we allow each party to assign different values to different ministries; however, the relative value of the ministries is the same for all three parties.

Case 2: Two of the parties – A and B – have the same preferences but the third party – C – has different preferences. We have two different vectors to denote the preferences of parties: $v_A = v_B = (a, b, c)$ where $a > b > c > 0$, and $v_C = (x, y, z)$ where $x, y, z > 0$. We can think of parties A and B as mainstream parties and Party C as a niche party that has a different assessment of the salience of policy issues.

Proposition 1: In Case 1 with the same value vectors for all parties, a two-party coalition is M_2 stable if and only if one party takes the most-valued ministry and the other party takes the other two ministries. For example, the stable coalitions formed by parties A and B are ABB and BAA .

⁴It is trivial to show that any coalition where one of the parties does not get any ministries is not stable.

⁵Note that for two-party coalitions the definitions of M_1 stable and M_2 stable will be the same because an objection can be made against only one party.

In the baseline case, where all parties have the same preferences, we observe a relatively equitable distribution of payoffs, which is in line with the findings of Schofield (1978). The obstacle against a completely equitable distribution is the fact that the number and the value of ministries are fixed. The stable coalition has the distribution that is as equal as possible given this restriction. A formateur party that wants to form a stable coalition government has to give up either its favorite ministry or the other two ministries to its coalition partner. In that case, the coalition partner cannot come up with a threat of a coalition with an outsider in which it would both be able to get a better payoff and provide the outsider an offer that cannot be matched by the formateur. Otherwise, the coalition partner may threaten with forming a coalition with the third party giving that party the most-valued ministry.

Proposition 2: In Case 2, where Party C has a different value vector,

M_2 stable coalitions formed by Party A and Party B are ABB and BAA .

M_2 stable coalitions formed by Party A and Party C are

ACC

CAA if $x > y$ and $x > z$

CAC if either of the following conditions hold

$$y \geq x + z$$

$$a \geq b + c \text{ and } y \geq x$$

CCA if $z \geq x + y$

In the case where one of the parties has preferences that are different from the other two parties, the stable coalitions formed by the parties with the same preferences are exactly the same as the baseline case. Similar to the baseline case, the formateur can always match the offer made by its coalition partner to the outsider party when the payoff distribution is relatively equal. Otherwise, the coalition partner can always threaten to form a coalition that gives both itself and the outsider more than what was/could be offered by the formateur.

The difference between the baseline case and the second case can be seen in the stable coalitions in which the party with the different preferences participates. When we look at the possible stable coalitions between Party A and Party C we see that more options are available. When we consider coalitions in options (c) and (d) with their respective conditions, however, we note that those coalitions are not Pareto optimum, that is, parties could divide the ministries in a way that would make both parties better off. If Party C values the second ministry more than the first ministry, coalition ACC , which is M_2 stable, would be a better

outcome than CAC for both parties. Similarly, if Party C values the third ministry more than the first two ministries, ACC would be a better outcome for both parties.

When we limit our attention to the Pareto optimum coalitions, we see obvious parallels between the stable coalitions formed by mainstream parties and those that include the niche party. The coalition ACC , where Party A gets its favorite ministry, is always stable. The coalition CAA , however, is only stable if the first ministry is the favorite ministry of Party C as well. In other words, if one of the mainstream parties wants to get into a stable coalition with the niche party which emphasizes an issue different from the mainstream party, the only option the mainstream party has is to take its favorite ministry and give up the other two ministries. Otherwise, the niche party can threaten with getting into a coalition with the other mainstream party where the niche party gets its favorite ministry.

In order to think about the implications of the propositions for the payoffs of different parties, we think of the situation where one of the parties is the formateur and gets to choose between the stable coalitions that it can form. First, the advantage of being the formateur is weakly greater for Party C . When Party A and Party C have the same favorite ministry, their options are the same. They either take the first ministry, which is the favorite ministry of both, or they take the second and the third ministries. When Party C has a different favorite ministry, its only option is to give its partner the first ministry. This option means, however, that Party C gets its favorite ministry and an additional ministry. Second, when Party C is not the formateur, it is a weakly less desirable coalition partner. When Party A and Party C have the same favorite ministry, Party A would be indifferent between A and C . When Party C has a different favorite ministry, CAA is not an option anymore; therefore, Party A would prefer Party B if Party A 's utility from taking the second and the third ministries is higher than the utility from taking the first ministry. The following example illustrates these implications.

Example: Consider the case where parties assign the following values to the ministries.

$$v_A = v_B = (45, 35, 20) \text{ and } v_C = (35, 45, 20)$$

If Party A is the formateur, it gets to choose among coalitions ABB , ACC , and BAA . If Party C is the formateur, it gets to choose between coalitions ACC and BCC . The utilities that the two parties get from each of these options are the following:

$$u_A(ABB) = u_A(ACC) = 45$$

$$u_A(BAA) = 55$$

$$u_C(ACC) = u_C(BCC) = 65$$

Now we can compare the situation of parties when they can choose the coalition that they want to form. Although Party A seems to have more options to choose from, we see that Party C can get higher utility because its options involve taking the second ministry, which

is its favorite ministry, as well as the third. When Party C is not the formateur, however, it can find itself at a disadvantage because it would be a less desirable coalition partner. Compare parties B and C in this example. When Party A is the formateur, it would prefer Party B as the coalition partner because its utility from coalition BAA is higher than its utility from coalition ACC , which is the only stable coalition that parties A and C can form.

This is contrary to our expectation that Party C would have an advantage in coalition bargaining because it would be “cheaper” to buy. This happens because ACA is not a stable option although it is the coalition with the highest total value. Party C can object to ACA with coalition BCC against Party A cannot have any counter objection. Hence, having a different preference is both the strength and the weakness of Party C in coalition bargaining. When Party C has a favorite ministry that is different from the other two parties, it gets to keep it in addition to another ministry. Precisely because ACC is the only stable coalition that Party A can form with Party C , Party C becomes a less desirable coalition partner. In a way Party C cannot commit to not asking for more.

Conclusion

The literature on coalition governments has come a long way in explaining the size of coalitions, the characteristics of coalition partners as well as the distribution of ministries among them. The predictors for the portfolio allocation that were widely discussed are the seat share and the ideological position of the parties. Another important factor that influences the bargaining power and the decisions of the parties is their preferences over ministries. The general assumption in portfolio allocation studies is that all parties want to maximize the number of ministries that they have. Even when the salience of ministries was considered, it was usually assumed that the desirable ministries were the same for all the parties in question. In this paper, we relax this assumption, and ask whether niche parties that are likely to place more emphasis on certain ministries than mainstream parties would have an advantage in bargaining over portfolios.

In answering our question, we use the notion of stability because it takes into account the options that parties have, and identifies the coalitions that would be self-reinforcing. We set up a simple problem of division of three ministries among two coalition partners, and compare the payoffs received by mainstream and niche parties in the stable coalitions. The payoffs in the coalitions are fairly equitable in coalitions formed by two mainstream parties. In this case, the only stable coalitions formed by two mainstream parties are those in which one of the parties receives the most-valued ministry and the other party gets the other two ministries. When a coalition is formed between a mainstream party and a niche

party, however, the latter has a slight advantage. In this case, the only stable coalition is the one in which each party receives its most-valued ministry, and the niche party receives the third ministry. Hence, it is possible for the niche party to form stable coalitions with larger payoffs; however, this may end up being a disadvantage as the niche party may be considered as a less desirable coalition partner.

While our model provides an attempt to answer a question that was not widely discussed in the literature, there is a lot of room for future research. First, the model can be extended to more than three ministries to see whether the results would be similar. Second, parties with different seat shares can be incorporated in the model. This is particularly important since niche parties usually have smaller seat shares in the parliaments.

Appendix

Proof of Proposition 1: Consider the coalition ABB . To any objection that Party A can make, Party B can respond by making the same offer to Party C , and vice versa. Consider the coalition ABA . Party B can object with BCC against which Party A does not have any counter objection. Consider the coalition AAB . Party B can object with CBC against which Party A does not have any counter objection. The cases for coalitions BAA , BAB , and BBA are symmetrical.

Proof of Proposition 2: The proof for the stable coalitions formed by parties A and B is the same as the proof for Proposition 1.

For the stable coalitions formed by parties A and C :

1. [(a)]
2. Consider the coalition ACC . To any objection that Party A can make, Party C can respond by the counter objection BCC . To any objection that Party C can make, Party A can respond by making the same offer to Party B .
3. Consider the coalition CAA . To any objection that Party A can make, Party B can respond by the counter objection CBB . To any objection by Party C , where Party C gets two ministries, Party A can respond by making the same offer to Party B . If $x < y$, however, Party C can also object with coalition BCB against which Party A has no counter objection. Similarly, if $z < y$, party C can object with coalition BBC against which Party A has no counter objection.
4. Consider the coalition CAC . To any objection that Party C can make, Party A can respond by making the same offer to Party B . If Party A objects with ABB , Party C can respond by the counter objection BCC ; however, for this counter objection to be possible we should have $a \geq b + c$ and $y \geq x$. Alternatively, Party C can respond

by the counter objection BCB if $y \geq x + z$. If Party A objects with BAA , Party C can respond by the counter objection BCC . However, for this counter objection to be valid, we should have $y > x$, which is an easier condition than the ones listed in the Proposition. Finally, If Party A objects with ABA or AAB , Party C can respond by the counter objection CBC .

5. Consider the coalition CCA . To any objection that Party C can make, Party A can respond with the counter objection BBA . If Party A objections with BAB , Party C can respond by the counter objection BBC ; however, for this counter objection to be possible we should have $z \geq x + y$. The conditions for responding to other possible objections by Party A are easier to satisfy. Party C can respond to objection ABB with BBC if $z \geq x + y$ or with BCC if $a \geq b + c$ or $z \geq x$. It can respond to objections ABA with BCC if $z \geq x$. Finally, it can respond to objection AAB with counter objection CCB .
6. Consider the coalitions ACA and AAC . Party C can object with BCC against which Party A cannot have any counter objection.

References

- Aumann, Robert J. and Michael Maschler. 1964. The bargaining set for cooperative games. In *Advances in game theory*, ed. Lloyd S. Dresher, Melvin; Shapley and Albert William Tucker. Princeton University Press, Princeton, NJ.
- Ansolabehere, Stephen, James M. Snyder Jr., Aaron B. Strauss, and Michael M. Ting. 2005. "Voting Weights and Formateur Advantages in the Formation of Coalition Governments." *American Journal of Political Science* 49(3):550-563.
- Axelrod, Robert M. 1970. *Conflict of interest: a theory of divergent goals with applications to politics*. Markham Pub. Co.
- Baron, David P. and John A. Ferejohn. "Bargaining in Legislatures." *American Political Science Review* 83(4): 1181-1206.
- Bassi, Anna. 2013. "A Model of Endogenous Government Formation." *American Journal of Political Science* 57(4):777-793.
- Browne, Eric C. and Mark N. Franklin. 1973. "Aspects of Coalition Payoffs in European Parliamentary Democracies." *The American Political Science Review* 67(2):453.
- Frechette, Guillaume R., John H. Kagel and Massimo Morelli. 2005. "Gamson's Law Versus Non-cooperative Bargaining Theory." *Games and Economic Behavior* 51:365-390.
- Gamson, William A. 1961. "A Theory of Coalition Formation." *American Sociological Review* 26(3):373.

Groseclose, Tim and James M. Snyder. 1996. "Buying Supermajorities." *The American Political Science Review* 90(2):303.

Laver, Michael and Kenneth A. Shepsle. 1996. *Making and Breaking Governments: Cabinets and Legislatures in Parliamentary Democracies*. Cambridge University Press.

Martin, Lanny W. and Georg Vanberg. 2003. "Wasting Time? The Impact of Ideology and Size on Delay in Coalition Formation." *British Journal of Political Science* 33(02):323-332.

Martin, Lanny W. and Randolph T. Stevenson. 2001. "Government Formation in Parliamentary Democracies." *American Journal of Political Science* 45(1):33.

Meguid, Bonnie M. 2005. "Competition Between Unequals: The Role of Mainstream Party Strategy in Niche Party Success." *American Political Science Review* 99(3):347-359.

Morelli, Massimo. 1999. "Demand Competition and Policy Compromise in Legislative Bargaining." *American Political Science Review* 93(4):809-820.

Peleg, Bezalel. 1963. "Existence theorem for the bargaining set M_1 ." *Bulletin of the American Mathematical Society* 69(1):109-110.

Riker, William H. 1962. *The Theory of Political Coalitions*. Yale University Press.

Schofield, Norman. 1978. "Generalised Bargaining Sets for Cooperative Games." *International Journal of Game Theory* 7(3/4):183-199.

Schofield, Norman. 1980. "The bargaining set in voting games." *Behavioral Science* 25(2):120-129.

Schofield, Norman and Michael Laver. 1985. "Bargaining Theory and Portfolio Payoffs in EuropeanvCoalition Governments 1945-83." *British Journal of Political Science* 15(02):143-164.

Snyder, James M. Jr., Micahel M. Ting and Stephen Ansolabehere. 2005. "Legislative Bargaining under Weighted Voting." *American Economic Review* 95(4):981-1004.

Verzichelli, Luca. 2008. Portfolio Allocation. In *Cabinets and Coalition Bargaining : The Democractic Life Cycle in Western Europe*, ed. Wolfgang C. Strøm, Kaare; Müller and Bergman Torbjörn. Oxford University Press pp. 237 - 269.

Volden, Craig and Clifford J. Carrubba. 2004. "The Formation of Oversized Coalitions in Parliamentary Democracies." *American Journal of Political Science* 48(3):521-537.

Warwick, Paul V. and James N. Druckman. 2001. "Portfolio Salience and the Proportionality of Payoffs in Coalition Governments." *British Journal of Political Science* 31(04):627-649.

Warwick, Paul V. and James N. Druckman. 2006. "The portfolio allocation paradox: An investigation into the nature of a very strong but puzzling relationship." *European Journal of Political Research* 45(4):635-665.