



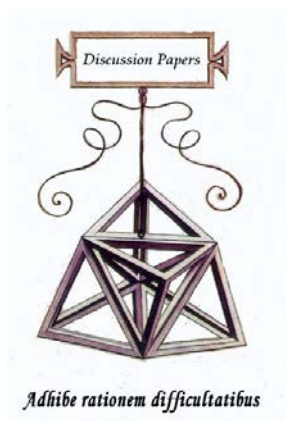
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P. Guarnieri e T. Luzzati

## **Some reflections on the “battle of the sexes”**

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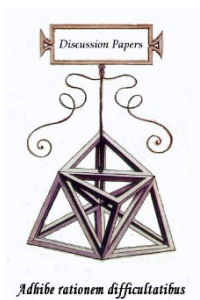
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Pietro Guarnieri e Tommaso Luzzati

## Some reflections on the “battle of the sexes”

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### Abstract

The “battle of the sexes” game is usually taken as an example to illustrate the difficulties of coordination. Two of its hypotheses, however, are unrealistic and not necessary to the story it tells. We refer to the assumptions that (1) “to go separately to the disliked event” gives the same payoff as “to go separately to the favourite event” and that (2) only two options are available to the partners. Relaxing those hypotheses leaves intact the original message of the BoS, while increases its narrative scope. According to the importance attributed by the agents to “to go out together”, the modified BoS can predict more outcomes than the original one. For instance, both “to go out separately”, and “to play together compromise options” become possible equilibria.

After a short survey of how the battle of the sexes is used in game-theory textbooks, we show the consequences of the proposed variations, firstly in a discrete and then in a continuous setting. An application to the recent Italian politics is attempted.

**Keywords:** coordination, compromise solutions, conflict resolution, political alliances.

**JEL:** A20, C72, D74

# Some reflections on the “Battle of the Sexes”

## 1. Introduction

The “battle of the sexes” (from here onwards shortened with “BoS”) is a well-known game that exhibits multiple equilibria with unequally distributed payoff, benefitting more one or the other player, depending on which equilibrium is chosen. Most game theory textbooks explicitly mention it as an example of the challenges posed by coordination. At the same time, they also use it to discuss some general difficulties of game theory, as recalled in section two.

The purpose of this note is to show that, while leaving intact the original message of the BoS, relaxing two of its hypotheses would increase its narrative scope. BoS would apply to a wider range of real-life situations, predicting that both “to go out separately”, and “to play together compromise options” are possible equilibria.

In the next section, we will briefly recall the origin of BoS and its use in popular game theory textbooks. In the third section, we will introduce two small changes to it and analyse their consequences. In the fourth section, we will reformulate our modified BoS in a continuous space. Before concluding, we will apply the new setting to the government agreement between *Lega* and *Movimento 5 Stelle*.

## 2. The battle of the sexes

To the best of our knowledge, the first appearance of the BoS was in the seminal book “Games and Decisions: Introduction and Critical Survey” by Luce and Raiffa (1957). They used this example mainly to show that “the analysis of non-zero-sum games is so much wilder and [...] so much interesting than is the zero-sum case” (Luce and Raiffa, 1957, 92).

As is well known, the story tells about a couple deciding how to spend the evening. The man and the woman have two options, namely, to go to a prize fight or to a ballet. Luce and Raiffa assume that, “following the usual cultural stereotype the man **much prefers** the fight and the woman the ballet; however, to both it is **more** important that they go out together than that each see the preferred entertainment”

(Luce and Raiffa 1957, p. 91, our emphasis). The payoff implies two Nash equilibria in pure strategies, that is (Fight, Fight) and (Ballet, Ballet), the first of which is more appreciated by the man and the second one by the woman.

Luce and Raiffa uses the following payoffs matrix<sup>1</sup>:

		F	
		Ballet	Fight
M	Fight	-1 -1	<b>2 1</b>
	Ballet	<b>1 2</b>	-1 -1

Figure 1: The battle of the Sexes

The BoS falls within the category of non-cooperative games because of the assumption that players cannot communicate and make a pre-play agreement before taking the decision. Indeed, each player decides without knowing what the other is opting for - as if the couple forgot where they decided to meet. Luce and Raiffa consider what would happen if a player discloses his/her strategy first. If, for example, player M reveals that he opts for “fight”, and player F believes in this announcement, then it is in her interest to choose “fight” and go to the boxing event. The same holds for an analogous announcement by player F. Moreover, the authors underline that a pre-play communication may have the effect of changing players’ preferences so that the payoffs matrix and the game itself may change accordingly. For example, an arrogant approach to the discussion by one of the two may elicit resentment in the other.

Since Luce and Raiffa’s contribution, the battle of sexes has become a classic in game theory textbooks, including gender-neutral versions. For instance, “fight” and “ballet” have been substituted by concerts where music either of Bach or of Stravinsky is played (Osborne-Rubinstein, 1994:15). Usually, the game serves the purpose of illustrating the notion of Nash equilibrium and its potential multiplicity. It is often presented alongside other coordination games, such as the “Hawk-Dove” game, also named “Chicken” game (e.g. in Binmore 2007a), or the “Stag-Hunt” (e.g. in Fudenberg and Tirole, 1991). BoS represents a useful didactical tool to explain mixed strategies equilibria (e.g., Gintis, 2012; Davis 2000) and related notions, such as “pre-play

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<sup>1</sup> In the original representation, the strategies of the woman are inverted. Therefore, so the equilibria are on the diagonal going from up-left to bottom-right cells.

randomization” and “cooperative payoffs regions” (Binmore 2007b). Finally, BoS is a starting point to introduce the theory of focal points and Pareto optimality (see in Fudenberg and Tirole, 1991: 18) and rationalizability (as in Tadelis, 2013) for discussing the issue of multiple equilibria selection.

### 3. Small variations on the BoS

The contribution of the present note is based on the observation that the story told by Luce and Raiffa does not need neither the payoff symmetry assumed when the partners go out separately, nor the restriction to only two options.

#### 3.1. Breaking payoff symmetry through intensity of preference

Luce and Raiffa assume that each partner gets “-1” when they go out separately. This symmetry does not reflect the words used by the scholars, who, by using the term “more” (see the quotation above), explicitly compare preference towards the event itself with the importance attributed to going out together. The payoffs that they use need a further assumption, that to go out separately cancels out any enjoyment from the event itself. If the partner does not come along, each is indifferent between going to the disliked and the favourite event. Such indifference is rather odd, and perhaps in contrast with the words of Luce and Raiffa according to which “the man much prefers the fight” (see the quotation above).

To make things more realistic, we propose to admit that individuals get some enjoyment also when each goes to her/his favourite event without the partner. In other words, and in terms of the original formulation, the man going alone would prefer the fight to the ballet, and vice versa for the woman. This change is not only made for improving the realism of the setting, it has also an important theoretical implication. Differently from the standard BoS, the state in which each goes out by him/herself can become equilibrium. The actual outcome depends on the preference intensity attached to “going out with the partner” as compared to that of the event itself.

Some example will easily illustrate this point. Assume that the utility functions are additively separable in two components, the personal attitude towards the events and the importance attached to going out together, which we label “ $T$ ”. Denote the utility of  $T$  with  $U_T$ , the utility of the preferred entertainment/event with  $U_P$ , and the utility of the

disliked one with  $U_D$ ; for the sake of simplicity let us assume that  $U_D=0$ . The term “preferred entertainment” is used by Luce and Raiffa to indicate the personal taste of each partner towards the event itself. We use it interchangeably with “favourite”. In any case, it does not refer to the technical meaning of preference ordering (over the outcomes).

If for both individuals the importance of  $T$  is bigger than that of the preferred event,  $U_T > U_P$ , the game would be the standard one, as in Figure 1a where  $U_T=5$  and  $U_P=4$ . However, the game would radically change if the relative importance assigned to “going out together” were lower enough, for instance  $U_T=3$ . We would have a different game, as the one depicted in Figure 1b. For this game, to play the strategy “preferred event” is the dominant strategy and (fight, ballet), that is, “to go out separately to the preferred event” becomes the unique Nash equilibrium.

	Ballet	Fight		
Fight	4 4	<b>9 5</b>		
Ballet	<b>5 9</b>	0 0		

Figure 1a: symmetrical preferences, “together” more important than the preferred event ( $U_T=5 > U_P=4$ )

	Ballet	Fight		
Fight	<b>4 4</b>	7 3		
Ballet	3 7	0 0		

Figure 1b: symmetrical preferences and “together” less important than the preferred event ( $U_T=3 < U_P=4$ )

The same preference setting (i.e. additively separable utility) is also useful to illustrate the effects of non-symmetrical preferences between individuals. To this purpose, let us label the individuals with  $j$  and  $i$ , which involves a gender-neutral narrative and assume that only for one partner “to go out together” is more important than his/her preference for the event, for instance  $U_T^j > U_P^j$  and  $U_T^i < U_P^i$ , the equilibrium outcome in pure strategies would be unique, that is, to go together to the favourite event of the partner having the relatively higher utility for the event itself. This outcome occurs in real life and is shown in Figure 2, where, for instance, “both going to the fight” is the only Nash equilibrium in pure strategies.

	Ballet	Fight		
Fight	<b>4 2</b>	<b>7 3</b>		
Ballet	3 5	0 0		

Figure 2. Only for partner  $j$  “together” is stronger than the preference for the preferred event,  $U_T^j=3, U_P^j=4, U_T^i=2$

To sum up, the scope of BoS story becomes wider by admitting that the preference for the event itself does cancel when the partners go out separately. This change, which is consistent with the original story told by Luce and Raiffa, opens new possibilities, that is, “to go out separately”, or “one partner adapts to the other” as unique equilibria.

### 3.2 Expanding the option domain: compromises

A second issue with the BoS is the number of options. The standard BoS game tells a story where the only compromise that is admitted by non-cooperative game theory is to play mixed strategies. This is a consequence of limiting the number of options to two. In real life, instead, considering a larger domain of options is a typical way to solve “conflicts”. For this reason, we introduce an intermediate option, “*M*” (e.g., to go to a movie), with  $U_M=2$  for both individuals. Figure 3 shows two possible games whose realisation depends on the relative strength of the two components of the preferences. If “to go out together” is more important than the intermediate option itself, but less than the respectively favourite options, two Nash equilibria in pure strategies are possible, namely, “to go out separately” and “to go to the movies together” (Figure 3a). When the relative preference for spending the evening together is strong enough for both, attending any events together is Nash equilibrium, as in the standard BoS (Figure 3b)<sup>2</sup>.

	Ballet	Movie	Fight		Ballet	Movie	Fight
Fight	<b>4 4</b>	4 2	<b>7.5 3.5</b>	Fight	4 4	4 2	<b>9 5</b>
Movie	2 4	<b>5.5 5.5</b>	2 0	Movie	2 4	<b>7 7</b>	2 0
Ballet	3.5 <b>7.5</b>	0 2	0 0	Ballet	<b>5 9</b>	0 2	0 0

Figure 3a: symmetrical preferences and “together” rather important ( $U_T=3.5$ ;  $U_P=4$ ;  $U_M=2$ )

Figure 3b: symmetrical preferences and “together” very important ( $U_T=5$ ;  $U_P=4$ ;  $U_M=2$ )

<sup>2</sup> Obviously, when the intensity of the preference of going together is lower than the preference for the intermediate options themselves, both of them would go separately to his/her own favourite event.



### 3.3 Do compromises become reasonable ways to play the game?

The changes that we suggested do not change the nature of BoS narrative, which remains a game exemplifying the difficulties of coordination. Adding options, however, might introduce reasonable ways to play the game and help selecting among equilibria, particularly for the case depicted in Figure 3.b. As suggested by Schelling (1960) people are often able to coordinate because they refer to a “focal point”, which is determined by some salient characteristics of the strategic options that are not represented by the game structure – such as the names attached to options, or the fact that options in real life situations appear in a certain order. In our modified BoS, the “new” equilibrium (*Movie, Movie*) might be a focal point because it is an intermediate option, preventing the conflict of interest between the two players, and providing a Pareto efficient solution.

The case illustrated in Figure 3b is the easiest one. (*Movie, Movie*) is a candidate for being a focal point because it is fairer<sup>3</sup> than (*Ballet, Ballet*) or (*Fight, Fight*), which reinforces its nature of intermediate compromising solution and of Pareto optimality. (*Movie, Movie*) is analogous to a reasonable way to play the original BoS, that is, tossing a coin and going together either to the theatre or to the fight. This solution, which is not equilibrium in a non-cooperative frame, is considered “equitable” by Luce and Raiffa (1957, p. 94).

For the case illustrated in Figure 3a the fairness criterion would not discriminate between the multiple equilibria. Another “reinforcement” of the focal point might be at play. The game is very similar to a Stag Hunt game<sup>4</sup>, with (*Movie, Movie*) as the payoff dominant equilibrium, and (*Fight, Ballet*) as the risk dominant equilibrium (see Harsanyi and Selten, 1988)<sup>5</sup>. Differently from the Stag Hunt, however, the payoff dominant equilibrium is also an intermediate solution. Both features might induce the players to see it as a focal point. A counter argument would be that two strategies

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<sup>3</sup> It is worth, noting that.

<sup>4</sup> In this coordination game, hunting a stag (that presupposes agents’ cooperation) gives to both player higher payoff than hunting hares (that can also be caught alone).

<sup>5</sup> According to the definitions firstly proposed by Harsanyi and Selten (1988), a Nash equilibrium is payoff dominant if it is Pareto-superior to all the other Nash equilibria. On the other hand, a Nash equilibrium is risk dominant when it is the less risky for both players given the uncertainty concerning the other player’s decision. In other words, in a symmetric 2x2 game, when the two players assign equal probability to the circumstances that the other player will chose one option or the other, and one of the two options results as strictly preferred for both of them, the strategy profile that they both opt for is the risk-dominant equilibrium.

(ballet for the man and fight for the woman) are dominated, which would transform the game in Figure 3.a in a standard Stag Hunt. Nonetheless, the existence of three strategies, even if one is irrelevant, might anyway make *(movie, movie)* as looking as a compromising solution and hence a focal point.

In conclusion, coordination can emerge because the intermediate option provides the opportunity for a sort of implicit agreement that is self-enforcing even though payoff considerations would not force the players to opt for it.

## 4. A continuous formulation of the BoS

It is well known that BoS can be interpreted as a bargaining problem, where individuals have to share a portion of a good (money). The BoS is limited to two asymmetric cases, where the distribution is unequal. Adding strategies, as we suggested above, allows different “distributions of the overall amount”. Clearly, all distributions for which the value of the “outside” option is lower than that of the lowest payoff received are Nash equilibria. In the standard BoS the value of the “outside” option is set to zero because of the assumption that each partner strongly dislikes to go out without the partner. The continuum of non-cooperative equilibria in the bargaining problem becomes unique with the cooperative solution provided by Nash (1950). Here, however, we remain in the context of non-cooperative games and introduce a simple continuous formulation of the modified BoS introduced in the preceding section.

Assume that preferences can be represented by a utility function, which is separable<sup>6</sup> in two components. The first one depends on an individual action  $x$  and the other on the discrete event  $T$  which occurs when players make mutually compatible choices, that is

$$U^h = \alpha^h x^h + \varphi^h T$$

The individual parameter  $\alpha$  indicate the intensity of preference for the action itself,  $x$ , while  $\varphi$  the importance attached to having mutually compatible actions (that is, to go out together). The phrase “compatible actions” can be formalized, as in the bargaining game, by assuming that the sum of their individual “bid” cannot exceed a given amount of good. We set this amount equal to 4 to get figures comparable to those of section 3, that is,

$$x^j \in [0, 4] \text{ and}$$

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<sup>6</sup> In the original BoS it is assumed that the two components are not separable, i.e.,  $U^h = x^h T \varphi^h$ .

$T=1$  iff  $(x^i + x^j \leq 4)$ ,  $T=0$  otherwise

We can distinguish two cases. The first case occurs when the importance of choosing compatible actions is for both players at least equal to the intensity of each one's preferences for the action itself ( $\alpha^i \leq \varphi^i$ ) and any combination of  $x^i$  and  $x^j$  such than  $x^i + x^j \leq 4$  is a Nash equilibrium. In this case, the generic individual  $i$  would fully renounce to the utility coming from the action itself and play  $x^i=0$  when the other player chooses  $x^j=4$ , as can be easily seen comparing the values of the utility,  $U^i_{(T=0)} = \alpha^i \leq U^i_{(x^i=0)} = \varphi^i$ . The reaction function is  $x^{i*} = 4 - x^j$  and the outcome is the same as in the bargaining game if played non-cooperatively.

The second case occurs when  $\alpha^i > \varphi^i$ , that is, when “ $T$  is not a must”. This case is more interesting since a threshold to the willingness to compromise emerges. If the agent  $j$  plays  $x^j = \varphi^j / \alpha^j$ , then agent  $i$  is indifferent between playing  $x^i = 4 - x^j$  (which implies  $T=1$ ) and  $x^i=4$  (which implies  $T=0$ ). Hence, when  $x^{j*} > \varphi^j / \alpha^j$  agent  $i$  prefers to make choices which are not compatible with agent  $j$ . Hence, his/her reaction function is the following:

$$x^{i*} = 4 - x^j \quad \text{when } x^j \leq \varphi^j / \alpha^j \quad \text{and } x^{i*} = 4 \quad \text{otherwise}$$

By plotting both reaction functions, the equilibria are easily shown. Figure 4a depicts a situation in which the preference for the event itself is rather important as compared to the importance of playing compatible options, so that the thresholds of the willingness to compromise are rather low. In this case, the only equilibrium is  $E_0$ , in which individuals make incompatible choices. Figure 4b depicts the case occurring when the thresholds are high enough to let emerge equilibria with compatible choices. In this case, the individual  $i$ 's reaction curve goes down from point  $(0,4)$  to  $E^i$  and then jumps again to  $x^i = 4$ , while individual  $j$ 's goes up from point  $(4,0)$  to  $E^j$  and then jumps again to  $x^j = 4$ . Hence, there is also a continuum of equilibria between  $E^j$  and  $E^i$ .

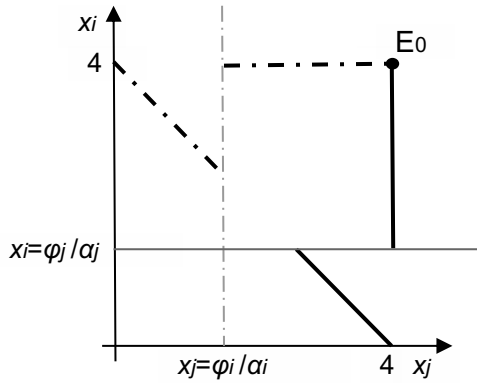


Figure 4a: reactions curves when the willingness to compromise is low

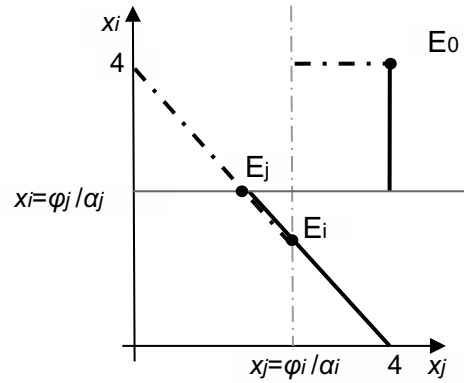


Figure 4a: reactions curves when the willingness to compromise is sufficiently high

Let us now move back to a discrete example. In Figure 5, we further extended the domain of options and let the two individuals have different preferences ( $\varphi^i=4$  and  $\varphi^j=3$ ). The values in parentheses allow converting labels into values used for the continuous representation. Due to the existence of thresholds, not all states where the two agents go out together are equilibria. Moreover, symmetry is no longer a necessary outcome. In this case, we will have the following equilibria: (*Fight*; *Ballet*), (*Horse race*, *Horse race*) and (*Movie*; *Movie*) corresponding respectively to  $E_0$ ,  $E_1$ , and  $E_2$  in figure 6, which is the continuous representation of this game. Notice that since agent- $i$  attaches relatively less importance to going out together, the couple can end up in a state, equilibrium  $E_1$ , which is closer to agent- $i$ 's preferred entertainment. Figure 5 allows to see that the higher is the importance of going out together, the bigger the portion of the reaction curves that overlaps (hence the number of equilibria in the discrete case), and *vice-versa*.

$i \downarrow$ $j \rightarrow$	Ballet (4)	Comedy (3)	Movie (2)	Horse race (1)	Fight (0)
Fight (4)	4 4	4 3	4 2	4 1	7 4
Horse race (3)	3 4	3 3	3 2	6 5	3 0
Movie (2)	2 4	2 3	5 6	2 1	2 0
Comedy (1)	1 4	4 7	1 2	1 1	1 0
Ballet (0)	3 8	0 3	0 2	0 1	0 0

Figure 5. A 5x5 battle of sexes with non-symmetrical preferences.

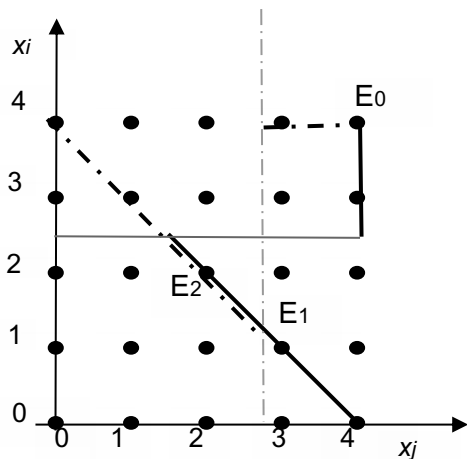


Figure 6. A 5x5 battle of sexes in the continuum space of the bargaining problem

Finally, it is worth mentioning that to allow for decreasing marginal utility of  $x$ , which is straightforward, would not add novel insights. At the same time, complementing decreasing marginal utility with satiation would slightly change the picture. In this case, the reactions curves would be parallel to each axis as long as the individual is satiated and then follow the 45° diagonal only when the amount of good “left” by the other is not enough to satiate him/her. Figure 6a shows that if the reaction curves intersect in their flat portion, we would have a unique equilibrium in which, however, the good might not be completely distributed. Both the existence of a portion of the good that is not distributed and the uniqueness of the equilibrium would depend on the parameters representing the preferences.

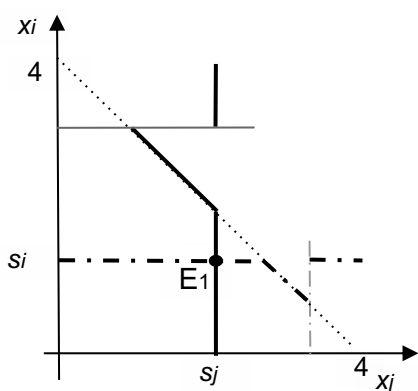


Figure 6.a. When satiety implies a unique equilibrium

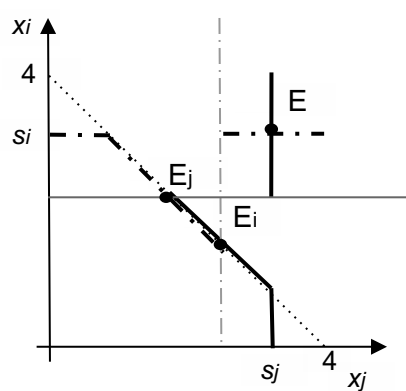


Figure 6.b. When satiety does change qualitatively the picture

## 5. The modified BoS and Italian politics

We want now draw the attention of the reader to the fact that the modified setting also allows to make a different exercise with respect to the original one. The BoS is a game of agents who have conflicting attitudes, but a stronger desire for playing the same action. The modified BoS allows to tell also about situations where the importance of the favourite event is so high that the agents initially prefer “to go out separately”, as in the Nash equilibrium (*Fight, Ballet*) of Figure 1.b. What could change this situation and make “coordination” an equilibrium? The discussion in sections 3 and 4 suggested both that something can happen and increase the “utility” of coordination/compromise ( $U_T$ ), and that distant preferences could be reconciled also by introducing new compromising options.

Such a mental experiment suggests that the modified BoS is useful to analyse situations different from the interaction of a couple, a case for which repeated games seem to us more relevant. There are many real circumstances where the game is actually a one-shot game, much more than in the couple relationship example. We refer to processes such as peace conferences, the writing of constitutions, and the formation of new governments. The passage from a conflict situation, in which the parties prefer “to go alone”, to the one in which a compromise becomes available, and possibly self-enforcing as an equilibrium solution, can be described by the modified BoS. Those processes require compromise solutions to emerge to mediate between positions (and preferences) that are very far from each other. At the same time, the interest in a joint solution may increase as the result of a deliberation process<sup>7</sup> that may motivate parties to rely more on common background values, than on differences.

The shift from a non-coordination to a coordination equilibrium can be illustrated by an example drawn from a recent political event, namely, the formation of the Italian government in Spring 2018, which is based on the agreement on the so called

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<sup>7</sup> Modelling deliberation process behind political compromise is out of the scope of this paper, and in any case, would imply considering a sequential game and/or pre-play communication. However, as highlighted in Guarnieri (2018), that discusses the process that lead to the agreement on the first article of the Italian Constitution, interactive deliberation can account for the emergence of self-enforcing compromise solutions, and, in this sense, for the formation of institutions. This approach can in turn contribute to the recent debate (Hindriks & Guala, 2014, 2015; Greif & Kingston, 2011; Aoki, 2001, 2007; Hédoïn, 2017; Hodgson, 2006) on the possibility of re-unify the field of institutional studies by epistemologically reconcile the social-ontological rule-based approaches (Searle, 1995, 2005, 2010; Gilbert, 1989) and the game-theoretical equilibrium-based approach (Schotter, 1981; Sugden 1982; Young, 1998).

“*Contratto per il governo del cambiamento*” between *Lega* and *Movimento 5 Stelle*. The two parties have rather different political platforms and electoral constituencies. Elections, however, ended out in a very uncertain situation, in which forming a government together was perhaps the only viable alternative to going back immediately to elections, which would have been risky for both. On the contrary, forming a government was a prime opportunity to show their ability of breaking with the past, producing that “novelty” so much wanted by their constituencies, and thereby consolidating their popularity. In terms of the modified BoS, the “reward” of “going out together” increased after the elections and during the period of uncertainty that followed them. Indeed, after long negotiations, the leaders of the two parties signed the *Contratto*, which contains the political agenda that they are committed to implement during the legislature. In terms of our discussion, this can be told as the emergence of a new intermediate alternative including elements of the two platforms.

It has also to be highlighted that the two parties were not in a symmetrical condition. *Lega* belonged to the right wing and run its campaign trial together with three allies, *Forza Italia*, *Fratelli d’Italia*, and *Noi con l’Italia-UDC*. *Movimento 5 stelle* had a lock-in in its origins as a movement against traditional parties and hence could not run the campaign trial announcing political allies, least of all with the *Partito Democratico* with which the relationships had always been very conflictual. Hence, it is not implausible to think that the reward from the agreement ( $U_T$ ) was higher for *5 Stelle* and perhaps that the agreement resulted closer to *Lega*’s priorities, as in Figure 5 (*Horse race, Horse race*) or Figure 6 (*equilibrium E1*). This might be one of the several reasons why opinion polls reported that in about six months after the election *Lega* almost has doubled its popularity and overcame *5 Stelle*, who has decreased from almost the 33% of the elections to about 30%.

To summarize, the modified BoS can be a useful narrative tool for illustrating negotiation outcomes. In the case of the *Lega-5 Stelle* government formation, the election outcome strongly changed the importance attributed by the parties to the agreement and induced them to solve the coordination problem by envisioning new compromising options that were not at stake before the interaction itself. Two parties, with far political platforms, got an agreement that was difficult to expect before the elections, and that will last as long as they will assign high value to coordination.

## 6. Concluding remarks

The Battle of the sexes is a classic example of game theory, often used to illustrate the difficulties of (non-cooperative) coordination of agents who have different preferences toward possible actions but has also a strong preference for playing the same action. The purpose of the present note was to show that small variations of its original formulation greatly expand the scope of its applicability.

BoS is a rather unrealistic example because of two reasons. First, the preference for playing a same action is so strong that it cancels the preference for the actions themselves if not played jointly. If they go out together each gets a higher payoff from their favourite event, but if they go out separately they are assumed to be indifferent between going to the favourite and the disliked event. Such an assumption is not in line with present days, where partners are more autonomous and freer than when the game was proposed. The second unrealistic assumption is that their domain of choice is limited to only two options.

We hope to have convinced the reader that relaxing both assumptions leaves intact the original power of BoS since both assumptions are not necessary to tell the original story. The original outcome is still there, in the modified BoS. The advantage of relaxing the original assumptions is to show that the same strategic situation, that is, “agents with strongly different preferences but a desire to play jointly”, can end up in many ways. More specifically, the modified BoS can be used to not only tell stories of unbalanced extreme outcomes, but also about equilibria where agents play compromises, or even play separately. This is the reason why we conclude that using more realistic assumptions about agents' preferences and a larger choice domain enrich the narrative power of the BoS.

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