Bargaining for Longevity*

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Abstract

I propose a theoretical framework of two-party bargaining in which a proposer with complete discretion over resource allocation between her and a partner faces a trade-off between immediate gains and long-term stability. I particularly focus on the role of dynamic outside options in driving this trade-off and show that the benefit of being a proposer may not be in the share she appropriates within the relationship but rather in her ability to determine its longevity. The proposer sometimes strategically concedes to her partner only because she expects the coalition to terminate early; she buys the partner's long-term support just so that she can maintain control over the timing of her preferred exit.

*I thank John Patty, Maggie Penn, Jessica Sun, Teddy Kim, Georgy Egorov, Arseniy Samsonov, Greg Sasso, Dan Alexander, Sean Gailmard, Kristopher Ramsay, and Sangmin Lee, as well as the audience members at Theory & Models Working Group at Emory University, SPSA 2023 Annual Meetings in St.Pete Beach, Florida, and EITM 2023 for very helpful comments on this project. All errors are my own.

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1 Introduction

Parties with varying preferences need to act collectively repeatedly within a given term in office, for example, to pass legislation, maintain a government or foster administrative cooperation. Repeated interaction among parties induces them to be farsighted, taking into account not only the immediate gains at hand but also how this affects their future payoffs (e.g., Bassi, 2017; Buisseret and Bernhardt, 2017; Bils and Izzo, 2023).

In this paper, I consider a two-party strategic interaction that involves one party with unilateral control over resource allocation, while both parties retain the ability to abandon the relationship in favor of outside opportunities. The continued participation of both parties then depends on the initial terms of the agreement, which creates a trade-off between the terms and length of the relationship - the idea being that the proposer must weigh the benefits of maximizing short-term advantage against the need to secure the partner's collaboration in the future (e.g., Jacobs, 2008; Penn, 2009; Battaglini, Nunnari and Palfrey, 2012).

Such dynamics are not unique to any specific institutional setting. For example, in the US, the Speaker of the House exercises significant control over committee assignments. When making the decision the Speaker has to consider what strikes an optimal balance between maintaining the Speaker's own hold on power and conceding enough to satisfy the members of the other faction. This problem can also be found in other instances of partnerships with unequal bargaining powers, including organizational hiring or personal relationships. As a leading example, I consider two parties bargaining to form a coalition government. Forming a coalition requires a compromise between two or more separate political parties. The duration of such coalitions depends crucially on the compromise that the coalition initially strikes, implying that parties inherently face a similar trade-off between terms and length (e.g., Diermeier, Eraslan and Merlo, 2003; Indridason, 2015).

A distinctive feature of this process in my model is that I allow the attractiveness of outside opportunities to vary over time. In the model, a proposer in my model has complete discretion over how much share to offer her partner. In the next stage, the proposed amount is pitted against a random draw in each period. Both players then decide in each period whether to continue the partnership and receive the initial allocation or whether to end the game by choosing the draw. I examine what the optimal allocation of resources is for the proposer, who needs to take account of both her immediate gains at hand as well as the effect of her choice on the probability that her partner terminates the relationship for potentially better future opportunities. How much will the proposer optimally value the future over the present?

Naturally, if the proposer exploits her proposal power too aggressively, it could result in the partner leaving for an alternative partnership; this provides her with the incentive to concede some of the share. However, because the outside opportunities of parties are stochastically drawn, the *timing* of defection now becomes important for both parties. For example, if the proposer plans to break away from the partnership for a better outside option, she would want to do so when her outside option is the highest. For her to defect at the optimal time, she has to make sure that her partner doesn't leave the partnership first. This creates an incentive for the proposer to overcompensate to her partner just so that she can be the one to time the exit.

This paper's main contribution is to show that the benefit of being a proposer may not be in the share she appropriates within the relationship but rather in her ability to determine its longevity. Consistent with the findings of the existing studies, the proposer in my model sometimes compromises more to bargain for longevity. However, she may also compromise more only because she expects the coalition to terminate *early*. In this case, the proposer strategically concedes to her partner and buys his long-term support but leaves the partnership as soon as she draws her favorable outside option.

Consider Israel in 2020. After the election in March, Netanyahu's Likud and Gantz's Blue and White agreed to form a coalition government. Despite the large disparity in Knesset members between the two blocs—the Likud bloc with 54 members and Blue and White with 20 members—the coalition agreed to have an equal number of cabinet ministers aligned with each bloc. Parties also agreed to a rotation government where Gantz succeeds Netanyahu as the Prime Minister of Israel for at least 18 months from November 2021.[1]

Such generous terms of the agreement largely stemmed from Netanyahu's intention to determine the timing of a new election. Netanyahu was facing three criminal charges against him at the time of the election, and there was uncertainty about how the legal proceedings would unfold. Ne-

[1] The terms of the agreement also provided that Gantz serves as defense minister when the new government is sworn in with Netanyahu as the Prime Minister.

tanyahu made sure that he could stay in power for long enough, which would give him a platform to postpone his trial and also bolster his status as the representative who embodies the injustice of the courts and the legal system (Shamir and Rahat, 2022). He was also aware that Blue and White did not have many options at hand. Prior to the election, Gantz vowed to form a government that would not include Netanyahu. By reversing his stance and forming a coalition with Netanyahu, the party lost a sizable share of the alliance as well as voters. The poll rate in December 2020 indicated that Gantz's electoral prospects were bleak, expecting to win just five seats in the next election compared to 28 seats expected for Likud (Staff, 2020). With such considerations of future electoral prospects, Netanyahu, while keeping Blue and White in the coalition by offering generous concessions, strategically "retained the option to topple the government whenever he sees fit (Jamal, 2021, p.14)." In December 2020, Netanyahu ultimately dissolved the government just nine months into the coalition.

For the remainder of the introduction, I first discuss previous empirical and formal works on related areas of study and identify the gap in the literature that I aim to address with my model. I then move on to introduce a brief overview of the model and its main findings which may rationalize Netanyahu's move in 2020.

1.1 Outside Options in Coalition Bargaining

Past studies have considered coalition bargaining in the context of "outside options," or walk-away values. These values are what a negotiator secures by walking away from the bargaining table (Lupia and Strøm, 2006; Schleiter and Bucur, 2023). This concept has been used to encompass the notion of seat shares while at the same time incorporating other aspects of bargaining power, representing benefits from new elections that lead to a new regime and yield utilities or the willingness of other parties to start coalition negotiations with a party. It also means that the concept captures the dynamic aspects of future bargaining power rather than a static view of the future that models bargaining power simply as a function of legislative seat shares. This problem has become more important given the trend of growing party system instability in the past several decades.[2] This, coupled with the growing importance of media on public opinion (e.g., Kumlin and Esaiasson, 2012), implies that political events such as scandals or economic shocks are more likely to reshape the political landscape now than ever.

While both formal and empirical works have considered the effect of such changes in outside options on government termination and policy changes, these works mostly posit that parties strategically react to shocks *after* they occur; they do not examine how parties bargain *in expectation of* such potential changes in outside options. Some of the models most closely related to this work present a one-period (Lupia and Strøm, 1995) or an infinitely repeated (Baron, 1998) bargaining model where a public opinion shock provides parties with information about their future electoral prospects, and parties respond accordingly. They find that such shocks may result in dissolution when parties expect large benefits from an election and derive little value from the seats they currently control. Diermeier and Merlo (2000) further this intuition by showing that minimal-winning coalitions may form if it is too expensive for the formateur to maintain surplus or minority coalitions over time. More recently, Becher and Christiansen (2015) highlight the effect of outside options with respect to the dissolution power and find that prime ministers with the power should have incentives to exploit public support for policy gains.

Other works take this perspective in empirical studies. Martin (2000) investigates the impact of public opinion shocks on government termination and observes that an expected increase in seats for coalition members leads to a noticeable impact on government termination only when the government gets closer to the end of its term in office. Walther and Hellström (2019) empirically investigate two different mechanisms that link popular support and government stability; high popular support leads to a greater likelihood of opportunistic elections, while low support leads to higher frequencies of a non-electoral replacement. Kayser and Rehmert (2021) and Kayser, Orlowski and Rehmert (2023) develop a novel measure of party leverage—coalition-inclusion probabilities—

[2] Studies have consistently identified increasing and persistently high electoral volatility in many established and new democracies; established parties in older European democracies are becoming less popular with the voters (Pedersen, 1979; Drummond, 2006; Chiaramonte and Emanuele, 2017), and volatility in post-communist countries have opened doors to non-traditional parties and candidates (Birch, 2003; Sikk, 2005; Tavits, 2005, 2008; Powell and Tucker, 2014).

and find that shifts in these probabilities of green parties strongly predict environmental policy change, while seat shares and political polls do not.

These studies altogether highlight the notion that the ability of a government to remain in power depends upon its vulnerability to unexpected shocks in the political environment. However, they focus primarily on how parties respond after these shocks occur and not on how they act in anticipation of them. I argue that parties respond to exogenous events not only at the time of their occurrence but also *preemptively* during the initial portfolio allocation process and propose a theoretical framework that addresses this gap. A farsighted proposer in my model takes into account such potential changes when making the initial offer to her partner, which influences her expectations about the duration of the government and ultimately the portfolio allocation.

The framework, in this regard, also complements existing works that focus on the parties' trade-off between the terms and length of the agreement. A number of studies find that farsighted actors and their desire for stability can induce moderation in their division of resources in the short run. These works recognize that entering office does not result in an immediate one-time payoff; instead, it results in a stream of benefits that continues as long as the government stays in power (Golder and Thomas, 2014). Parties therefore may be willing to make concessions over the current benefit in exchange for the long-run stability value. In Penn (2009)'s model, a policy that is chosen in a round becomes the reversion point of the next round of bargaining and remains in effect until it is replaced by a new alternative. This consideration leads to the recognition that policies that fairly divide benefits between members of a winning coalition leave individual players best off in the long run. Indridason (2015) proposes a two-period model of legislative bargaining and shows that the formateur will prefer to compromise and form a coalition that will stay in place in the second period when he values the future enough.

A distinctive aspect of my model compared to these works is its incorporation of how parties' future incentives to defect vary dynamically over the life of a government. By examining the effect of changing outside options on the portfolio allocation process, we can understand how they affect the proposer's strategic considerations when deciding how much to value the future over the present. I show that incorporating this dynamic aspect of shocks lends additional support to several empirical results discussed in the literature, including the lack of proposer advantage in portfolio allocation and weak-party bias.

1.2 Overview of Results

The baseline model in this paper consists of two stages. In the first stage, the proposer unilaterally decides on an allocation of resources between her and her partner. In the next stage, the proposed amount will be pitted against a random draw in each period. Both parties then decide in each period whether to continue the partnership and receive the initial allocation or whether to end the game by choosing the draw. Each party leaves the relationship when he or she is unwilling to trade the present benefits of leaving against the expected value of remaining in the partnership. Following this strategy, the proposer must make strategic calculations about the allocation that will influence the future duration of the government. Note that this is a stylized version of coalition bargaining. As will be detailed later in the article, the process of proto-coalition formation or formateur selection is outside the model. The proposer and the partner are assumed to have already been selected prior to the game, and they simply bargain over the allocation of cabinet portfolios. However, this parsimonious framework is useful in clearly delineating how parties may bargain in consideration of future fluctuations in outside options and its implications on resource allocation and government duration.

Some key findings of this article are as follows. First, I identify an additional equilibrium class—**buyout equilibrium**—under which the proposer's advantage in terms of the portfolio share she appropriates may not be obvious. Existing formal models that emphasize future considerations find that proposer advantage may disappear when the proposer often foregoes her short-term interests to secure long-term cooperation (e.g., Morelli, 1999; Indridason, 2015). While the above mechanism is also present in my model, I further show that the proposer may optimally concede more of her share even when she has no interest in a stable relationship. The proposer in this case has a high outside option and is thus strongly motivated to leave after a favorable draw of her outside option. However, she wants to make sure that her partner won't leave first; she therefore buys the long-term support of the partner just so that she can be the one to time the dissolution of the coalition and ultimately a new election. This mechanism is present even after considering the presence of renegotiation or audience costs (see Section 5 and Appendix E, G for more details). Formal models that fail to take this equilibrium into account may lead to an overstatement of proposer advantage in the portfolio allocation we observe; the result, in this sense, further helps explain empirical results (Browne and Franklin, 1973; Browne and Frendreis, 1980; Laver and Schofield, 1998; Warwick and Druckman, 2001, 2006) and lab experiments (Diermeier and Morton, 2005; Frechette, Kagel and Morelli, 2005) that observe no significant premia in portfolio allocation for proposer parties.[3] More importantly, this also implies that the lack of proposer advantage in terms of portfolio allocation should not be thought of as evidence of a lack of proposer advantage in general; the proposer may be conceding to the partner in return for the power to defect at an opportune time.

A second implication of my model relates to the finding that a partner may be worse off with a higher outside option. A partner with a moderately higher outside option may, in equilibrium, receive a smaller offer and be worse off than one with a lower option, which speaks to the existing literature that has consistently identified a tendency for large parties to be under-compensated and for small parties to be overcompensated in the allocation of government portfolios (Browne and Franklin, 1973; Browne and Frendreis, 1980; Warwick and Druckman, 2006; Indridason, 2015).[4] Specifically, my model describes two mechanisms where such weak party bias would occur. First is the effect of the partner's outside option becoming too expensive to buy (Austen-Smith and Banks, 1988; Baron, 1991; Diermeier and Merlo, 2000; Snyder Jr, Ting and Ansolabehere, 2005). Under this mechanism, the proposer wants the partnership to last and therefore is willing to buy her partner's support. When the partner's outside option is sufficiently low, it can work as leverage for more compromise, inducing a larger offer and thus a higher payoff for the partner. However, if it is too high, the proposer may simply give up on persuading the partner, offer nothing in equilibrium, and let the partnership terminate. A partner with a lower outside option may thus be better off in equilibrium.

Additionally, we observe a qualitatively different weak party bias when the buyout equilibrium

[3] See Morelli (1999); Carroll and Cox (2007); Bassi (2013); Battaglini (2021) for other formal models that suggest different mechanisms behind the lack of first mover advantage.

[4] Note that the literature on weak-party bias uses legislative seat shares as a measure of "relatively weak" parties, while my model defines them as parties with lower outside options. Empirical implications may thus not follow through directly, but the results are consistent in that more inequality in bargaining strength can sometimes lead to less *ex-post* inequality observed as bargaining terms.

prevails. Now, the proposer overcompensates even when she has no incentives for stability. She is willing to concede to her partner insofar as the partner's outside option is low enough, as this allows her to keep the partner satisfied until the right time for dissolution arrives. Consistent with the above mechanism, the partner may be worse off as his outside option increases because he has now become too expensive to persuade (hence the weak party bias), but the strategic incentive behind the proposer's overcompensation is fundamentally different. This mechanism captures the logic that the proposer is willing to overcompensate small parties to retain their support throughout the government (Golder and Thomas, 2014; Indridason, 2015) while further uncovering a novel strategic consideration of the proposer regarding coalition termination.

Third, the model uncovers non-monotonic relationships among outside options, proposer compromise, and government duration that, if unaccounted for, will lead to an underestimation of their effect on one another. Studies have suggested that a larger compromise leads to a longer duration of the government (Lupia and Strøm, 1995; Huber, 1996; Martin, 2000; Heller, 2001; Diermeier, Eraslan and Merlo, 2003). My model shows that a reverse relationship can be possible: more compromise may lead to a *shorter* duration of government when the proposer's outside option is sufficiently high relative to her partner's. Such a non-straightforward relationship is driven by the ambiguous effect of an increase in the proposer's outside option on her optimal compromise. The buyout equilibrium predicts that the proposer sometimes compromises more as her outside option increases because she concedes in anticipation of her own defection in the future. These points altogether suggest that government duration needs to be considered in conjunction both with the degree of compromise as well as parties' outside options, and failing to consider the heterogeneous effects of outside options will underestimate the effect size of the proposer's compromise on government duration.

2 The Baseline Model

There are two players in the model, Party 1 (she) and Party 2 (he). Below I describe the two stages of the game: contracting stage and maintenance stage.

Contracting Stage. Party 1 chooses a division of dollar $(1-x, x)$ where $x \in [0,1]$. The key issue of the bargaining process that parties face when forming a coalition government is the allocation of government resources, e.g., cabinet portfolios. The term x in my model represents Party 1's offer on the allocation of these resources, normalized to a value between 0 and 1; larger x means more compromise.[5] Note that this is a type of "dictator game" in that Party 1 provides a one-time offer to Party 2, after which the game moves on to the next stage and Party 2 is unable to veto the offer right away. [6]

Maintenance Stage. In each period $t \in \{0, 1, 2, \ldots\}$ of the maintenance stage, both parties receive an outside option ω_i^t independently drawn from a Bernoulli distribution defined by $\omega_i > 0$ and $p \in (0,1)$. That is, Party i's outside option in period t is $\omega_i^t = 0$ with probability $1-p$ and $\omega_i^t = \omega_i$ with probability p.[7] After each party privately observes ω_i^t, parties simultaneously choose

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5 We need not assume the dollar to represent the entire government resources or portfolio allocation. Rather, it more closely depicts the resources or portfolios subject to distributive conflicts, such as the distribution of "bonus ministries above parties' proportional shares," which builds on the framework of Browne and Franklin (1973), and Baron and Ferejohn (1989); Becher and Christiansen (2015) more broadly.

6 My model can be generalized to cases where there is no designated formateur. Similar to the approach of Herrera, Reuben and Ting (2017), one can also envision that at some time in the future, the second party becomes the formateur, and so forth in alteration for future periods. The one-shot asymmetric game equilibrium described here remains an outcome of this more complex repeated interaction. Introducing a probabilistic formateur selection rule will also not change the core results of the model.

7 In Appendix H, I also consider the case where ω_i is continuous and drawn from a Normal(μ, σ) distribution. Markov perfect strategy that is stationary to a continuous and unbounded state shock always has a positive probability of bargaining termination; there thus is no equilibrium where parties never leave in this setup (instead, the probability that parties leave tends to 0). Otherwise, the core dynamics of the game remain unchanged.

$a_i^t \in \{0, 1\}$. The game continues as long as both parties choose to stay in each period ($a_i^t = 0$ for all i at time t). If either of the two parties chooses to leave, the party who leaves receives his or her lottery payoff, and the game ends. If a party stays while the other chooses to leave, he or she gets a 0.[8] The payoff structure is summarized in the table below. Each party's total utility is the discounted sum of his or her per-period payoffs, discounted by an exogenous and commonly known discount factor $\delta \in (0, 1)$.

Party 1 \ Party 2	$a_2^t = 0$	$a_2^t = 1$
$a_1^t = 0$	$(1 - x, x)$	$(0, \omega_2^t)$
$a_1^t = 1$	$(\omega_1^t, 0)$	(ω_1^t, ω_2^t)

Table 1: Payoff Structure in the Extension

A non-zero outside option ω_i and the probability of drawing it p can be interpreted in largely two ways. First is to think of ω_i as the value of a potential partnership with an outside party. Outside option ω_i in this sense will be the continuation value that takes into account the future value of a new partnership. We can rewrite this as $\omega_i = \kappa/(1 - \delta)$, where κ represents a new offer from an alternative party. Then, the probability of drawing a favorable outside option p represents the volatility in the political environment. What will the party's coalition inclusion probability be in a given period (Kayser and Rehmert, 2021; Kayser, Orlowski and Rehmert, 2023)? How likely will a new party emerge during the government that might change the political landscape?

Relatedly, outside option ω_i may also represent the benefit a party gains from defecting at an opportune time. For instance, a party at the time of the bargaining might be faced with a scandal. The party's high outside option would be its expected popularity after the party comes out ahead of the scandal. Alternatively, an immigration crisis might be on the horizon; the outside option in this case represents the party's payoff from refusing to compromise with his partner who prefers a more lenient policy toward the absorption of asylum seekers and maintaining a firm stance on the issue. Probability p in this regard will be the prospect of the party's scandal, or how likely a particular issue will be salient at a given time.

[8] In Appendix D, I assume that a party can still draw ω_i even when the other party has defected in the given period. All qualitative results remain consistent.

Finally, the discount factor δ can be interpreted in two different ways. First, it could reflect the political impatience of parties to enjoy the fruits of agreement. This impatience may result from electoral considerations or from the personal preferences of parties. When parties are patient, the political discount factor is high, resulting in a higher value of the future. This means that parties would value a longer length of agreement. When parties are impatient, they value future less. Another way is to interpret δ as the probability of the game being continued by external factors. In other words, even if parties choose to stay, the duration of the coalition may be subjected to a fixed probability of exogenous breakdown, caused by natural catastrophes, an institution of new laws or regulations, abrupt changes in the political structure, introduction of new technology, and so on (Zwick, Rapoport and Howard, 1992). Specifically for this model, it could represent an exogenous probability of random replacement of political appointees or parties.

3 Interpreting the Assumptions

Prior to analyzing the model, I offer a few comments on this model's assumptions.

No renegotiation. In the model, once Party 1 makes an initial offer of x in the contracting stage, she cannot change her offer later on in the maintenance stage; more specifically, she is unable to offer more after her partner draws a high outside option. The main purpose of this assumption is to direct the focus of this paper to examine the dynamic aspect of the model where Party 1 proposes an offer in anticipation of Party 2's behavior in the subsequent stage, which is conditional on both the size of the outside option as well as the probability that it is drawn. In Appendix G, I incorporate the possibility of renegotiation and find that the equilibrium outcomes are qualitatively similar. Alternatively, however, it is possible to think of the outside option in my model as potentially being the benefit that each party receives from the reshuffled cabinet.

Proto-coalition. I assume that Party 2 has already been invited to join the coalition and parties are bargaining on terms. While this formulation is restrictive in terms of the general question of how parties choose their negotiating partners (Golder, Golder and Siegel, 2012), note that my model also incorporates the possibility of a negotiation failure, as highlighted in the literature

(Ecker and Meyer, 2020). In the maintenance stage, Party 2 is able to leave in the very first period, which effectively means that the offer is rejected and the duration of the coalition is 0, i.e., coalition broke down immediately.

Ideological preferences. I omit explicit considerations of ideological differences between parties, although they are implicit in my model in two ways. First, Party 1's offer x can be understood as an ideological compromise normalized to a value between 0 and 1. If the parties have absolute loss preferences, then any policy in their Pareto set in a unidimensional model is equivalent to a divide-the-dollar game. Later I also include an extension in Appendix B, where I explore the case where Party 1 can offer a negative x, extracting policy compromise from Party 2.[9]

Second, I look at an extension where the probabilities of parties drawing a positive outside option are correlated. In this extension, I use parameter r to represent the conditional probability; when $r > p$ the two probabilities are positively correlated, and when $r < p$ they are negatively correlated. High r substantively means that an exogenous shock is more likely to affect the parties jointly. This could be interpreted as the parties sharing similar ideological stances and thus being subject to the same shocks in the political environment. A complete analysis of this extension is in Appendix C.

4 Equilibrium Analysis

I now proceed to characterize and describe the equilibrium behaviors of Party 1 and Party 2. I analyze this game by backward induction.

Optimal strategy of parties given x. The solution concept I employ is stationary Markov perfect equilibrium (MPE). I restrict attention to pure strategies for simplicity. Since the stability of the agreement is maintained only if both parties prefer to sustain it, the expectation of what outside options parties would draw and how they would behave in response to the draws are crucial to

[9] Results show that even when Party 1 *extracts* $|x|$ from Party 2, the partnership can still last for a positive amount. This is because Party 2 is willing to pay the cost to wait for a potential draw of a high outside option, ω_2.

understanding how Party 1 will allocate the resources in the contracting stage. It is easy to see that leaving is weakly dominated when outside option $\omega_i^t = 0$; in other words, parties will never leave ($a_i^t = 0$) when $\omega_i^t = 0$. Each party's strategy therefore hinges on what to choose when he or she draws a high outside option ($\omega_i^t = \omega_i$). There are four possible strategy profiles: 1) *both never leave*, 2) *Party 1 will leave* when $\omega_1^t = \omega_1$ and Party 2 never leaves, 3) Party 1 never leaves and *Party 2 will leave* when $\omega_2^t = \omega_2$, and 4) *both will leave* when $\omega_i^t = \omega_i$.[10] It follows that

- *Both never leave* when $(1-\delta)\omega_2 < x < 1-(1-\delta)\omega_1$,
- *Party 1 will leave* when $x > \max\left\{1-(1-\delta)\omega_1, \frac{(1-\delta(1-p))\omega_2}{1-p}\right\}$,
- *Party 2 will leave* when $x < \min\left\{1-\frac{(1-\delta(1-p))\omega_1}{1-p}, (1-\delta)\omega_2\right\}$,
- *Both will leave* when $1-\frac{(1-\delta(1-p))\omega_1}{1-p} < x < \frac{(1-\delta(1-p))\omega_2}{1-p}$.

These four cases together are exhaustive but not mutually exclusive. More specifically, the first (*both never leave*) and the fourth (*both will leave*) cases may overlap - the same offer x can lead to multiple equilibria. I assume that *both never leave* in such a case. Generally, we observe that parties leave when their continuation value is greater than the payoff from taking the outside option and stay otherwise.

Party 1's optimal choice of x. Given exogenous parameters ω_i, p, and δ, Party 1's choice of x in the contracting stage determines parties' choices of action and hence the equilibrium outcomes in the maintenance stage.

Figure 1 illustrates how Party 1's optimal choice of x and its corresponding equilibrium outcome depend on ω_1 and ω_2. The four equilibrium outcomes discussed above are represented in different shades. I formally state the equilibrium conditions below.

Proposition 1 *Let* $A = (1-p)/(1-\delta(1-p))$ *and* $B = 1/(1-\delta)$. *In equilibrium,*

[10] It is always a Nash equilibrium for both parties to simultaneously choose to leave for all parameters and realizations of ω_i^t. However, as dynamic considerations do not come into play in this equilibrium, I do not consider it in the analysis.

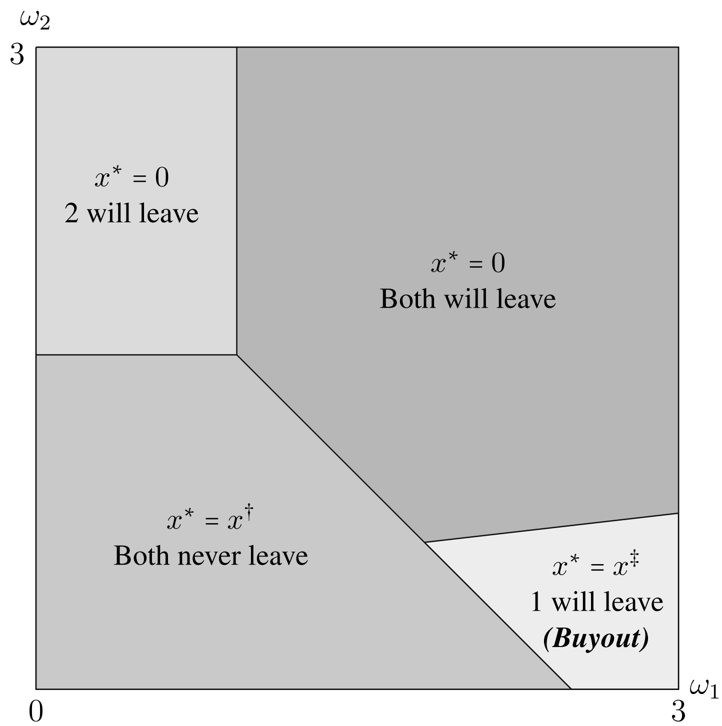


Figure 1: Equilibrium Outcomes
$\delta = 0.6, p = 0.4$

- *Party 1 offers* $x^\dagger \equiv \omega_2(1-\delta)$ *and both parties never leave in equilibrium if*

$$\omega_2 < B - A \quad \textit{and} \quad \omega_1 + \omega_2 < B.$$

- *Party 1 offers* $x^\ddagger \equiv (1-\delta(1-p))\omega_2/1-p$ *and Party 1 will leave in equilibrium if*

$$\omega_2 < \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} \quad \textit{and} \quad \omega_1 + \omega_2 > B.$$

- *Party 1 offers* 0 *and Party 2 will leave in equilibrium if*

$$\omega_1 < A \quad \textit{and} \quad \omega_2 > B - A.$$

- *Party 1 offers* 0 *and both parties will leave in equilibrium if*

$$\omega_1 > A \quad \textit{and} \quad \omega_2 > \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} \quad \textit{and} \quad \omega_1 + \omega_2 > B.$$

First consider low ω_2 (the lower half of Figure 1), i.e., when Party 2's "good" outside option is still not high enough. Then, depending on the value of ω_1, there are two equilibria: one where Party 1 concedes to *stay* and the other where she concedes to *leave*.

Conceding to stay. When ω_1 is sufficiently low, Party 1 in equilibrium offers $x^\dagger > 0$ and both parties never leave the agreement. This is a standard notion of the term-length trade-off where Party 1 concedes her immediate terms of the agreement for a lengthy cooperation in the future. Party 1's walk-away value is not high enough that she prefers to stay in the agreement; she thus chooses a good enough offer that induces Party 2 to stay, securing her stream of payoffs. Note that the exit threat of Party 2 is not too high that Party 1 can pay to keep him in the partnership.

Conceding to leave. However, as ω_1 increases, we see an equilibrium where Party 1 offers $x^\ddagger$ that induces Party 2 to always stay while she leaves immediately after drawing ω_1. I denote this region as the **buyout equilibrium** and explain its implications below.

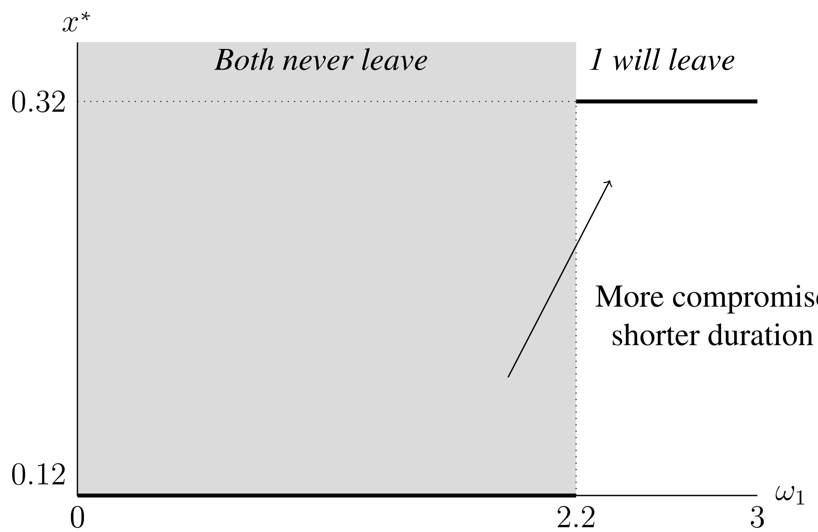


Figure 2: Optimal Compromise x^* with respect to ω_1
$\delta = 0.6, p = 0.4, \omega_2 = 0.3$

Figure 2 depicts the effect of an increase in Party 1's outside option on her optimal choice of x and its implications on the duration of partnership between the two parties. Equivalently, it is a horizontal slice of Figure 1 at $\omega_2 = 0.3$. Note that as ω_1 increases, her optimal level of compromise also increases. This is somewhat counter-intuitive since we would normally expect an increase in Party 1's outside option ω_1 to lead to a decrease in the amount Party 1 concedes to Party 2, yet we observe a larger level of compromise. The underlying mechanism behind the buyout equilibrium (the region where $\omega_1 > 2.2$ in Figure 2) is quite straightforward. Now that Party 1 has a higher outside option she wants to leave, but she wants to do it *with certainty*. This means that she is willing to pay Party 2 more in order to keep him in the relationship, just so that she can leave on her own terms. Just like in the above equilibrium, Party 1 gives up her present per-period benefit and buy the long-term support of Party 2, but this is not because she wants government stability; it is rather to capitalize on her outside option with certainty in the future.[11]

Importantly, this implies that the relationship between the proposer's compromise and the duration of government may be negative. Below I show that Party 1's optimal offer in the buyout equilibrium ($x^{\ddagger}$), if exists, is always larger than her offer in the equilibrium where both parties never leave ($x^{\dagger}$).

Proposition 2 *Let x^* be Party 1's optimal offer in equilibrium as a function of exogenous outside option ω_1. Conditional on a sufficiently low outside option of Party 2, $\omega_2 < (1-p)/(1-\delta(1-p))$, there always exists some $\widehat{\omega}_1$ such that*

$$\lim_{\omega_1 \to \widehat{\omega}_1^-} x^*(\omega_1) < \lim_{\omega_1 \to \widehat{\omega}_1^+} x^*(\omega_1).$$

Proposition 2 states that if ω_2 is sufficiently low (or when p is moderate), there always exists a discontinuous jump where Party 1 compromises more with higher ω_1, i.e., $x^{\ddagger} > x^{\dagger}$. Further, by definition, we know that the duration of cooperation must be shorter when Party 1 unilaterally leaves (buyout equilibrium) than when both parties never leave. This implies that in this region, more compromise leads to a shorter duration of government.

Corollary 1 *Party 1's optimal offer x^* in equilibrium is larger than half when*

1. *Party 1 concedes to stay and $\omega_2 > 1/(2-2\delta)$.*

2. *Party 1 concedes to leave and $\omega_2 > (1-p)/(2(1-\delta(1-p)))$.*

Corollary 1 further tells us that there exists a region where Party 1 concedes more than half, and characterizes the conditions under which we don't observe a proposer advantage even when the

[11] A simple but important point is worth noting here. Comparing the model's results to a version where outside options are drawn with probability 1 ($p = 1$), I find two crucial differences: (1) the buyout equilibrium does not exist and (2) parties never defect unilaterally. A formal model that assumes the outside options to be static thus fails to explain these empirical patterns.

model confers the strongest possible power to Party 1 in the sense that she has complete discretion over the terms of bargaining. Note that we observe this in both equilibria. When Party 1 concedes to *stay*, she offers more than half to Party 2 when she has preferences for stability; when she concedes to *leave*, however, Party 1 willingly gives up more than half to time her exit.

Now suppose that ω_2 is high (the upper half of Figure 1); Party 2's potential outside option is attractive, and his probability of leaving the partnership is now higher. We observe two additional equilibria.

Unable to buy longevity. When ω_1 is low, i.e., Party 1's outside opportunities are bleak, Party 1 wants the partnership to last. However, with sufficiently high ω_2, Party 1 is unable to buy the other party's support.

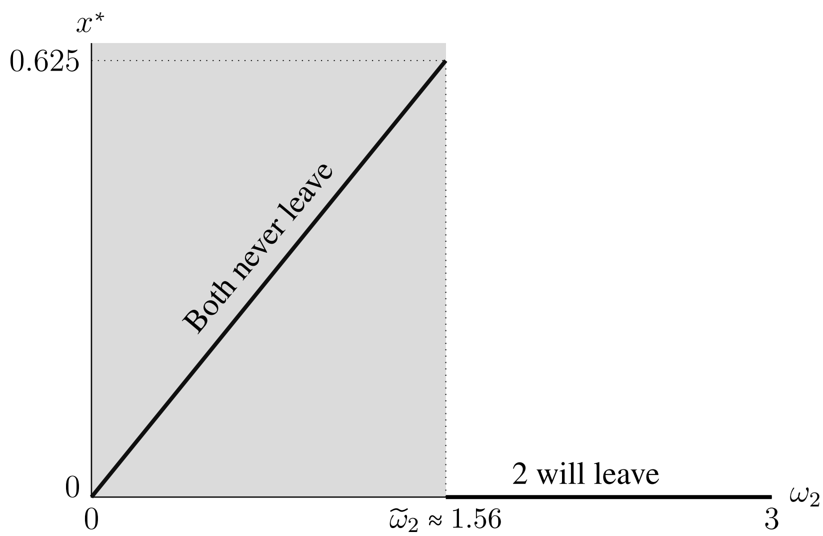
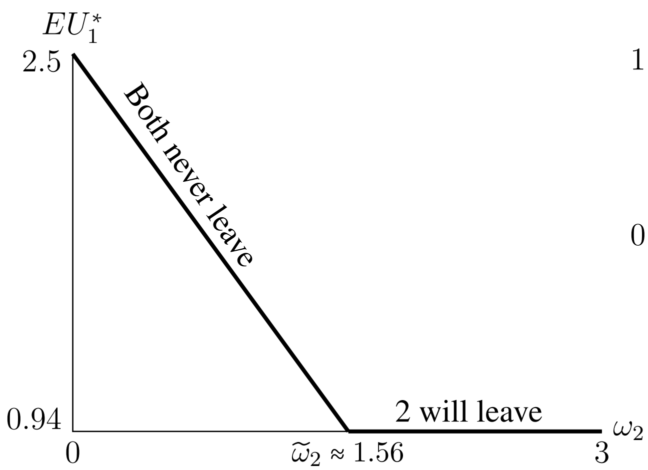


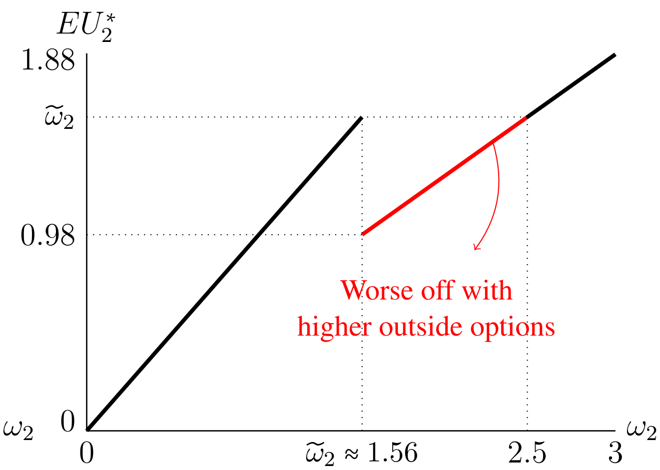
Figure 3: Optimal Compromise x^* with respect to ω_2
$\delta = 0.6, p = 0.4, \omega_1 = 0.5$

In Figure 3, I display Party 1's optimal choice x^* as a function of Party 2's outside option ω_2 given $\delta = 0.6$, $p = 0.4$, and $\omega_1 = 0.5$. Equivalently, it is a vertical slice of Figure 1 at $\omega_1 = 0.5$. We observe that optimal compromise x^* is not monotonically increasing in ω_2. When ω_2 is sufficiently low, Party 1 is willing to make a compromise ($x^* = x^\dagger$) to sustain the partnership. This equilibrium holds until the outside option reaches $\widetilde{\omega}_2 = B - A$. Afterward, however, Party 1 has to compromise too much to incentivize Party 2 to stay in the partnership. Therefore, she chooses $x^* = 0$ and lets the agreement break down as soon as Party 2 draws a high outside option, which is the discontinuous drop in Figure 3.

Unwilling to buy longevity. Suppose that ω_1 is high. Party 1's potential outside opportunities are now favorable enough that she is also willing to leave the partnership upon receiving a favorable draw. Similar to the equilibrium above, Party 1 offers nothing to Party 2 ($x^* = 0$), but *both* parties eventually leave after a good outside option. Offering 0 means that the duration of the agreement is finite. In this equilibrium, this is a conscious choice of Party 1 choosing terms over length - she prefers to play a short-lived game with Party 2 and refuses to compromise, knowing that the relationship will end soon.



(a) Party 1



(b) Party 2

Figure 4: Equilibrium Expected Payoffs
$\delta = 0.6, p = 0.4, \omega_1 = 1$

With the equilibrium conditions in hand, I move on to discuss each party's equilibrium payoff as a function of ω_2. In Figure 4a, Party 1's utility decreases in ω_2 when ω_2 is sufficiently low ($\omega_2 < \widetilde{\omega}_2$) because optimal compromise $x^* = x^\dagger$ increases in ω_2; intuitively, it takes more to persuade Party 2 when he has higher outside option. When his outside option is high ($\omega_2 > \widetilde{\omega}_2$), Party 1 offers no compromise. Her utility in this region with respect to ω_2 is now constant, as it only depends on the expected timing of Party 2's defection.

In Figure 4b, we observe that Party 2's utility increases with respect to ω_2 in both equilibrium regions, but with a discontinuous drop. With low ω_2, an increase in ω_2 leads to a larger compromise from Party 1 since ω_2 is still not too high that it is optimal for Party 1 to compromise more and keep Party 2 in the agreement. However, when ω_2 goes above a threshold, an increase in ω_2 now means that persuading Party 2 is too expensive. We thus observe a discontinuous drop between the two regions, as Party 1 switches from offering $x^* = x^\dagger$ to offering $x^* = 0$. Party 2's payoff in the second region increases only as a function of an increase in his outside option. It follows that Party 2 is worse off with a moderately high outside option than with a lower outside option, which can be seen from the red line segment in Figure 4b.

Proposition 3 *Let EU_2^* be Party 2's expected utility in equilibrium as a function of exogenous outside option ω_2. Then, there always exists $\widehat{\omega}_2$ that satisfies*

$$\lim_{\omega_2 \to \widehat{\omega}_2^-} EU_2^*(\omega_2) > \lim_{\omega_2 \to \widehat{\omega}_2^+} EU_2^*(\omega_2).$$

Proposition 3 shows that we always observe the aforementioned discontinuous drop. This result identifies the perverse consequences of a high outside option, as a partner with a lower outside option may be overcompensated and be better off because he is "easier to persuade." In this regard, more inequality in bargaining strength can sometimes lead to less *ex-post* inequality observed as bargaining terms.

5 Additional Extensions

In this section, I briefly introduce three extensions of the model that incorporate some additional features of coalition bargaining with the aim of providing a more nuanced analysis. I show that while there are minor shifts in equilibrium outcomes, the qualitative results from the models analyzed above continue to hold in these settings.

Renegotiation. The main models focus on how parties are forward-looking when negotiating the initial coalition terms with their partners. However, parties may be able to change their terms of agreement throughout their partnership. Coalition agreements may turn out to be suboptimal later, giving parties incentives to revisit the original deal via changes in portfolio design (Sieberer et al., 2021; Meyer, Sieberer and Schmuck, 2024) or policy compromises (Becher and Christiansen, 2015; Diermeier and Stevenson, 2000; Kayser and Rehmert, 2021). Allowing for shifts in the allocation of initial resources would, in this regard, speak to the theoretical ideas of coalition renegotiation as a response to outside options. To incorporate the possibility of renegotiation, I endow Party 1 with a chance to make a second offer to Party 2 with some probability when he announces that he will (unilaterally) leave. Now reshuffles may be strategically used by both parties. Party 1 can use it to protect herself from Party 2's unilateral defection; Party 2 utilizes it to extract more concessions from Party 1. I incorporate parameter σ that represents the exogenous probability that renegotiation may succeed. The baseline model is identical to this model with $\sigma = 0$. [12]

The equilibrium regions are qualitatively the same as in the baseline model, although Party 1 offers $x^* = 0$ more often with renegotiation now that she can change her offer later down the road. Successful renegotiation occurs when Party 2's outside option is moderate (see Appendix G for formal results). As expected, the renegotiated offer is always larger than the initial offer. There are largely two different patterns of successful renegotiation. First, we see Party 1's desire to avoid coalition termination when her outside option is low. Party 1 offers more to Party 2 during renegotiation and persuades him to stay in the partnership. Alternatively—and similar to the logic of the buyout equilibrium—Party 1 in equilibrium may offer more to Party 2 during renegotiation and convince him to stay, but after renegotiation, Party 1 leaves in equilibrium. This is when Party 1 has a high outside option. The effect of an increase in Party 2's outside option on the amount of renegotiation offer can thus be positive or negative depending on the size of Party 1's outside option.

Audience costs. In the baseline model, parties do not face any negative repercussions from defecting. Extensive works on coalition breakdown, however, find that terminations can be electorally

[12] Note that renegotiation with a perfect success rate essentially only works as a "second chance" for Party 1. Party 1, in most cases, can simply offer nothing to Party 2 until he announces to leave, after which Party 1 can propose some degree of compromise to Party 2 to persuade him to stay. We would thus expect all equilibrium outcomes in the baseline model to be present but *after* renegotiation. I thus incorporate parameter σ that represents the exogenous probability that renegotiation may succeed.

costly for the parties (Mershon, 2002; Narud and Valen, 2008; Plescia and Kritzinger, 2022; So, 2023), and voters especially punish parties that choose to leave the government (Warwick, 2012). In this extension, I add a parameter $c \in (0, \omega)$ that captures the audience cost that the defector incurs from abandoning the partnership. The results show that the presence of audience costs leads to an increase in the equilibrium region where Party 1 offers Party 2 nothing and Party 2 unilaterally defects from the coalition. This is because the presence of audience costs already deters Party 2 from defecting, and thus Party 1 is less incentivized to offer him a compromise. The dynamic is otherwise consistent with the baseline model.

Will parties ever *want* high audience costs? In another extension, I compare the baseline model to a scenario in which Party 1 faces a sufficiently high audience cost, discouraging her from leaving the partnership. I find that when outside options of both parties lie in an intermediate range, Party 1 prefers to tie her hands and "commit" to the partnership rather than to have the option to leave. Commitment forces her to concede more to Party 2 in equilibrium, but she prefers this over being able to leave, as this leads to a longer duration of partnership. Equilibrium analysis is described in detail in Appendix F.

Correlated outside options. Additionally, I consider an extension where the parties' outside options are correlated. If we interpret the outside options as prospects of a new election or coalition, it is natural to assume that various exogenous factors could result in their utilities from leaving to be either positively or negatively correlated. For instance, when a certain issue is more salient than others or when certain groups of voters are more active in a given period, one party having received a high draw could mean that the other party is also more or less likely to receive a high draw of outside options.

Intuitively, a positive correlation between the parties seems like a good deal for both parties. Both parties being likely to receive the higher outside option in the same period could mean that when parties leave, they are more likely to leave together, and when they stay, they are also more likely to do so together. Therefore, we might expect unilateral leaving to occur less often and the duration of the partnership to be longer. However, I find that this is only true under some conditions; for moderate values of outside options, a higher level of positive correlation can lead to less stable partnerships. In this region, a positive correlation could lead to government termination when a negative or no correlation between the outside options under the same parameters would have resulted in the parties staying in the coalition. Formal results and further discussion are in Appendix C.

6 Discussion and Empirical Implications

Lastly, I review several key contributions of my model and discuss their empirical implications.

Buyout equilibrium. One of the main contributions of the model is the finding that an increase in proposer compromise should not be taken as evidence of a lack of "proposer advantage." The buyout equilibrium finds that the proposer may be willing to concede precisely because she is highly incentivized to leave. She wants to call an opportunistic election when her prospect is favorable, but in order to sustain the coalition until the best timing for a new election, she keeps him in the relationship by offering more share of the pie. In this sense, the benefit of being a formateur does not come from the share she appropriates in the initial bargaining process but rather from the ability to time her defection. This also implies that the partner under this equilibrium will be "overcompensated" in terms of the share he is offered by the proposer, but unlike previous works that find such weak-party bias to occur when the proposer has preferences for a stable coalition (Indridason, 2015), the partner is offered more when the proposer ironically has no incentives for stability. Here, the proposer uses the partner's unwillingness to leave as a chance for her to leave at an opportune time. This result builds on other formal works that uncover possible mechanisms for why we observe a lack of formateur advantage (Carroll and Cox, 2007; Bassi, 2013; Battaglini, 2021) and weak party bias (Morelli, 1999), and further helps bridge the gap between the empirical evidence and standard models of legislative bargaining.

Proposer advantage. From an inferential standpoint, if the above equilibrium dynamic exists in data but is not controlled for, then the observed portfolio allocation will not be a reliable measure of the proposer advantage in question; the proposer with a higher outside option may compromise more in equilibrium. Note that we observe the buyout equilibrium when the relative difference in outside options between the parties is large in favor of the proposer party. This implies that empirical studies need to consider the *dyadic* aspect of outside options when examining the relationship between the proposer's outside option and her optimal level of compromise. Conditional on the partner's outside option being sufficiently high, an increase in the proposer's outside option leads to a decrease in her optimal level of compromise. However, when the partner's outside option is low, the association is positive; an increase in the proposer's outside option may *increase* the amount of compromise.[13]

The advantages of the proposer may instead be found in the rate in which we observe a strategic dissolution by the proposer party. Empirically, we expect to see higher frequencies of defection *by the proposer* when her outside option is sufficiently higher than that of the other party or when the probability of drawing a favorable outside option is moderate (i.e., higher variance of the distribution). This is largely related to the literature on opportunistic election (e.g., Grofman and Van Roozendaal, 1994; Schleiter and Tavits, 2016; Walther and Hellström, 2019), and it resonates with Kayser (2005)'s model of election timing, which examines the government's ability to time elections ("surf") and manipulate their economies ("manipulate") for political advantage and finds that, among others, the frequency of opportunistic elections is positively associated with the variance of economic performance.

Outside option, compromise, and government duration. The theoretical framework also tells us that the relationship between parties' optimal compromise and the overall government duration may not be straightforward. More compromise may lead to *a shorter duration of government*. This happens under the buyout equilibrium when the proposer bargains in expectation of future government termination.

Notably, such dynamic also implies an ambiguous relationship between the parties' outside options and the duration of government. As illustrated in Figure 5, my model predicts that an increase in the partner's outside option always leads to a decrease in government duration (Figure 5b), while an increase in the proposer's outside option may have a non-monotonic effect (Figure 5a). This is consistent with Martin (2000), which fails to find a significant relationship between

[13] An increase in the partner's outside option always leads to more compromise unless his outside option is too high.

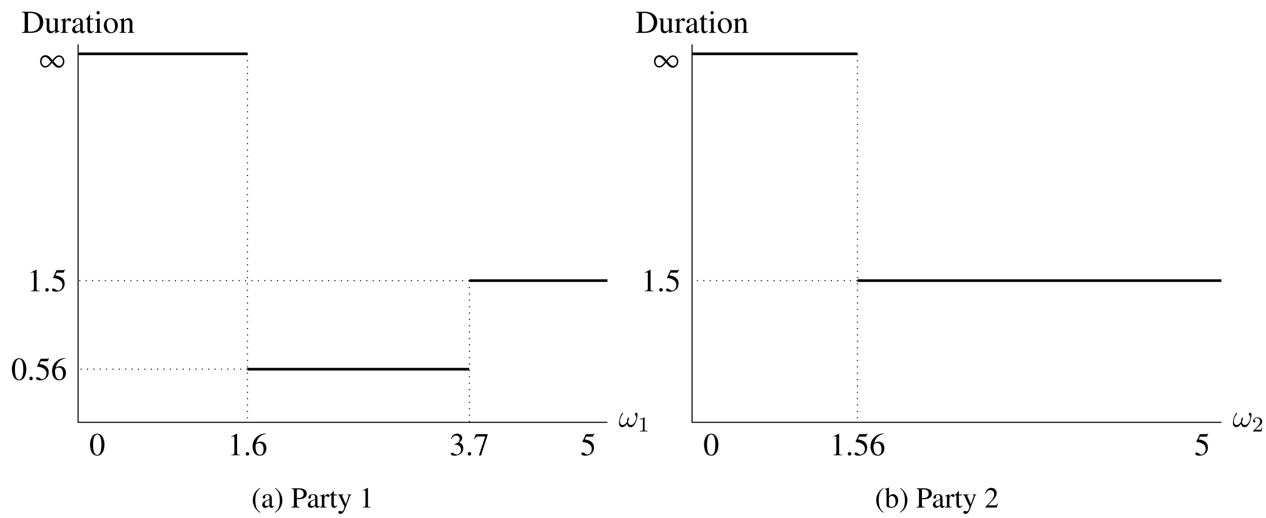


Figure 5: Equilibrium Duration of Partnership
$\delta = 0.6, p = 0.4, \omega_2 = 0.9$

the electoral prospects of the prime minister and government termination and only finds an effect for other coalition members.

7 Conclusion

The present value of any coalition is valued over time. While any coalition struck today might be the best available option for all of the coalition members, ruling out the possibility of this alignment of preferences *changing* is at odds with the non-trivial rate of coalitions ultimately collapsing. I have presented a simple model of bargaining with proposer advantage with the aim of considering the impact of dynamic outside options on both the contracting and maintaining phase in coalition bargaining. This paper provides a game-theoretic explanation of how cooperation might or might not last among actors who in the short term are inclined to take more for themselves. In particular, I return to the example introduced at the beginning of the paper and review the key contributions of the model.

The coalition between Netanyahu's Likud and Gantz's Blue and White in 2020 is an example of the buyout equilibrium in several aspects. Netanyahu's true advantage over Gantz didn't come from securing more resources from the coalition but rather from the ability to offer more to Gantz and ultimately time the election. Despite the numerical asymmetry between the two parties, Netanyahu made significant concessions to Gantz during the initial coalition bargaining, which kept Gantz in the coalition. Instead, Netanyahu expected his future outside option to be high and waited for the right time to end the partnership. He refused to pass the two-year budget and retained the ability to dissolve the coalition, yet when his outside option wasn't high in August with the second wave of COVID-19, he agreed to continue the coalition and postpone the election (Jamal, 2021); he ultimately called a new election exploiting the same budget crisis in December 2020.

As in this case, the theory presented in this paper also indicates why more compromise does not necessarily lead to a longer duration of government. A simple present-future trade-off fails to explain Netanyahu's strategic calculation in conceding more to Gantz. He was willing to give up some of the present benefits not to enjoy coalition stability but to disincentivize Blue and White from defecting first. We observe this dynamic: while the Gantz camp constantly pushed through a coalition-compliant budget that would keep the coalition going through 2021 and expressed its willingness to maintain the coalition, Netanyahu unilaterally chose to dissolve the coalition (Zielińska, 2020). This further highlights the model's insight on when we might observe a weak party bias. Gantz's Blue and White was offered a sizable concession despite the fact that Netanyahu was expecting his potential future prospects to be favorable and thus had no interest in maintaining the coalition. This resonates with the model's finding that a party with a low outside option may be overcompensated even when the proposer has no preferences for stability.

Overall, the model yields several conclusions. First, the buyout equilibrium tells us that the true proposer advantage may not be in taking more share of the portfolios but rather in the proposer's choice of coalition longevity. When the relative difference in outside options between the parties is large in favor of the proposer, the proposer may optimally make concessions at the bargaining table today in order to cash in on stochastically occurring outside options in the future. This dynamic further provides a novel account of why the proposer may optimally overcompensate a partner with a sufficiently low outside option and why we would expect to observe weak party bias even when the proposer has no preferences for stability. Such overcompensation of portfolio allocation also means that higher outside options should not simply be thought of as increasing a party's bargaining leverage. Lastly, more compromise by the proposer may lead to a shorter duration of government, as she sometimes offers more in anticipation of her own defection in the future.

The concept behind this paper can be applied to other instances of transactional partnerships with unequal bargaining powers. While I have analyzed one particular setting where two parties engage in a one-time bargaining over government resources, future research could take this insight in various other settings to examine how multiple agents may bargain in light of their outside options. Alternatively, we could endogenize the selection of the proposer in the model and study agents' preferences over having one agent as the proposer to another.

References

Allers, Maarten, Harm Rienks and Joes de Natris. 2022. "When are parties punished for serving in a coalition government?" *Electoral Studies* 79:102516.

Austen-Smith, David and Jeffrey Banks. 1988. "Elections, coalitions, and legislative outcomes." *American Political Science Review* 82(2):405–422.

Baron, David P. 1991. "A spatial bargaining theory of government formation in parliamentary systems." *American Political Science Review* 85(1):137–164.

Baron, David P. 1998. "Comparative dynamics of parliamentary governments." *American political science review* 92(3):593–609.

Baron, David P and John A Ferejohn. 1989. "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.

Bassi, Anna. 2017. "Policy preferences in coalition formation and the stability of minority and surplus governments." *The Journal of Politics* 79(1):250–268.

Battaglini, Marco. 2021. "Coalition formation in legislative bargaining." *Journal of Political Economy* 129(11):3206–3258.

Battaglini, Marco, Salvatore Nunnari and Thomas R Palfrey. 2012. "Legislative bargaining and the dynamics of public investment." *American Political science review* 106(2):407–429.

Becher, Michael and Flemming Juul Christiansen. 2015. "Dissolution threats and legislative bargaining." *American Journal of Political Science* 59(3):641–655.

Bergman, Torbjörn, Svante Ersson and Johan Hellström. 2015. "Government formation and breakdown in Western and Central Eastern Europe." *Comparative European Politics* 13:345–375.

Bils, Peter and Federica Izzo. 2023. "Ideological Infection.".

Birch, Sarah. 2003. *Electoral systems and political transformation in post-communist Europe*. Springer.

Browne, Eric C and John P Frendreis. 1980. "Allocating coalition payoffs by conventional norm: An assessment of the evidence from cabinet coalition situations." *American Journal of Political Science* pp. 753–768.

Browne, Eric C and Mark N Franklin. 1973. "Aspects of coalition payoffs in European parliamentary democracies." *American Political Science Review* 67(2):453–469.

Buisseret, Peter and Dan Bernhardt. 2017. "Dynamics of policymaking: Stepping back to leap forward, stepping forward to keep back." *American Journal of Political Science* 61(4):820–835.

Carroll, Royce and Gary W Cox. 2007. "The logic of Gamson's Law: Pre-election coalitions and portfolio allocations." *American Journal of Political Science* 51(2):300–313.

Chiaramonte, Alessandro and Vincenzo Emanuele. 2017. "Party system volatility, regeneration and de-institutionalization in Western Europe (1945–2015)." *Party Politics* 23(4):376–388.

Diermeier, Daniel and Antonio Merlo. 2000. "Government turnover in parliamentary democracies." *Journal of Economic Theory* 94(1):46–79.

Diermeier, Daniel, Hülya Eraslan and Antonio Merlo. 2003. "A structural model of government formation." *Econometrica* 71(1):27–70.

Diermeier, Daniel and Randolph T Stevenson. 2000. "Cabinet terminations and critical events." *American Political Science Review* 94(3):627–640.

Diermeier, Daniel and Rebecca Morton. 2005. "Experiments in majoritarian bargaining." *Social choice and strategic decisions: Essays in honor of Jeffrey S. Banks* pp. 201–226.

Drummond, Andrew J. 2006. "Electoral volatility and party decline in Western democracies: 1970–1995." *Political studies* 54(3):628–647.

Ecker, Alejandro and Thomas M Meyer. 2020. "Coalition bargaining duration in multiparty democracies." *British Journal of Political Science* 50(1):261–280.

Frechette, Guillaume, John H Kagel and Massimo Morelli. 2005. “Nominal bargaining power, selection protocol, and discounting in legislative bargaining.” *Journal of Public Economics* 89(8):1497–1517.

Golder, Matt, Sona N Golder and David A Siegel. 2012. “Modeling the institutional foundation of parliamentary government formation.” *The Journal of Politics* 74(2):427–445.

Golder, Sona N and Jacquelyn A Thomas. 2014. “Portfolio allocation and the vote of no confidence.” *British Journal of Political Science* 44(1):29–39.

Grofman, Bernard. 1989. “The comparative analysis of coalition formation and duration: Distinguishing between-country and within-country effect.” *British Journal of Political Science* 19(2):291–302.

Grofman, Bernard and Peter Van Roozendaal. 1994. “Toward a theoretical explanation of premature cabinet termination: With application to post-war cabinets in the Netherlands.” *European Journal of Political Research* 26(2):155–170.

Heller, William B. 2001. “Making policy stick: why the government gets what it wants in multiparty parliaments.” *American Journal of Political Science* pp. 780–798.

Hellström, Johan and Torbjörn Bergman. 2011. Birds of a feather flock together? Government duration and cabinet ideological diversity in Western Europe. In *6th ECPR General Conference, Reykjavik, 25th-27th August, 2011*.

Herrera, Helios, Ernesto Reuben and Michael M Ting. 2017. “Turf wars.” *Journal of Public Economics* 152:143–153.

Hu, Lin. 2014. Essays on political economy. Technical report Arizona State University.

Huber, John D. 1996. *Rationalizing parliament: legislative institutions and party politics in France*. Cambridge University Press.

Indridason, Indridi H. 2015. “Live for today, hope for tomorrow? Rethinking Gamson’s Law.” *Working Paper from the Department of Political Science of the University of California* pp. 1–34.

Jacobs, Alan M. 2008. "The politics of when: Redistribution, investment and policy making for the long term." *British Journal of Political Science* 38(2):193–220.

Jamal, Amal. 2021. "Polarization, populism, and brinkmanship." *The Institute for Palestine Studies-USA. https://www.palestine-studies.org/sites/default/files/attachments/books/ips*$_{C}urrentIssues_{7F}inal.pdf$.

Kayser, Mark A and Jochen Rehmert. 2021. "Coalition prospects and policy change: an application to the environment." *Legislative Studies Quarterly* 46(1):219–246.

Kayser, Mark A, Matthias Orlowski and Jochen Rehmert. 2023. "Coalition inclusion probabilities: a party-strategic measure for predicting policy and politics." *Political Science Research and Methods* 11(2):328–346.

Kayser, Mark Andreas. 2005. "Who surfs, who manipulates? The determinants of opportunistic election timing and electorally motivated economic intervention." *American Political Science Review* 99(1):17–27.

King, Gary, James E Alt, Nancy Elizabeth Burns and Michael Laver. 1990. "A unified model of cabinet dissolution in parliamentary democracies." *American Journal of Political Science* pp. 846–871.

Krauss, Svenja. 2018. "Stability through control? The influence of coalition agreements on the stability of coalition cabinets." *West European Politics* 41(6):1282–1304.

Kumlin, Staffan and Peter Esaiasson. 2012. "Scandal fatigue? Scandal elections and satisfaction with democracy in Western Europe, 1977–2007." *British Journal of Political Science* 42(2):263–282.

Laver, Michael and Norman Schofield. 1998. *Multiparty government: The politics of coalition in Europe*. University of Michigan Press.

Lupia, Arthur and Kaare Strøm. 1995. "Coalition termination and the strategic timing of parliamentary elections." *American Political Science Review* 89(3):648–665.

Lupia, Arthur and Kaare Strøm. 2006. "Coalition Governance theory: Bargaining, electoral connections and the shadow of the future." *Cabinets and Coalition bargaining: the democratic cycle in western Europ* .

Martin, Lanny. 2000. "Public opinion shocks and cabinet termination." *Typescript, Florida State University* .

Mershon, Carol. 2002. *The costs of coalition*. Stanford University Press.

Meyer, Thomas M, Ulrich Sieberer and David Schmuck. 2024. "Rebuilding the coalition ship at sea: how uncertainty and complexity drive the reform of portfolio design in coalition cabinets." *West European Politics* 47(1):142–163.

Morelli, Massimo. 1999. "Demand competition and policy compromise in legislative bargaining." *American Political Science Review* 93(4):809–820.

Narud, Hanne Marthe and Henry Valen. 2008. "Coalition membership and electoral performance." *Cabinets and coalition bargaining: The democratic life cycle in Western Europe* 2008:369–402.

Pedersen, Mogens N. 1979. "The dynamics of European party systems: changing patterns of electoral volatility." *European journal of political research* 7(1):1–26.

Penn, Elizabeth Maggie. 2009. "A model of farsighted voting." *American Journal of Political Science* 53(1):36–54.

Plescia, Carolina and Sylvia Kritzinger. 2022. "When Marriage Gets Hard: Intra-Coalition Conflict and Electoral Accountability." *Comparative political studies* 55(1):32–59.

Powell, Eleanor Neff and Joshua A Tucker. 2014. "Revisiting electoral volatility in post-communist countries: New data, new results and new approaches." *British Journal of Political Science* 44(1):123–147.

Saalfeld, Thomas. 2008. "Institutions, chance and choices: The dynamics of cabinet survival in the parliamentary democracies of Western Europe (1945-99).".

Schleiter, Petra and Cristina Bucur. 2023. "Assembly dissolution powers and incumbency advantages in coalition formation." *West European Politics* pp. 1–24.

Schleiter, Petra and Margit Tavits. 2016. "The electoral benefits of opportunistic election timing." *The Journal of Politics* 78(3):836–850.

Shamir, Michal and Gideon Rahat. 2022. *The Elections in Israel, 2019–2021*. Taylor & Francis.

Sieberer, Ulrich, Thomas M Meyer, Hanna Bäck, Andrea Ceron, Albert Falcó-Gimeno, Isabelle Guinaudeau, Martin Ejnar Hansen, Kristoffer Kolltveit, Tom Louwerse, Wolfgang C Müller et al. 2021. "The political dynamics of portfolio design in European democracies." *British Journal of Political Science* 51(2):772–787.

Sikk, Allan. 2005. "How unstable? Volatility and the genuinely new parties in Eastern Europe." *European journal of political research* 44(3):391–412.

Snyder Jr, James M, Michael M Ting and Stephen Ansolabehere. 2005. "Legislative bargaining under weighted voting." *American Economic Review* 95(4):981–1004.

So, Florence. 2023. "Serious Conflicts with Benign Outcomes? The Electoral Consequences of Conflictual Cabinet Terminations." *American Political Science Review* pp. 1–15.

Staff, Toi. 2020. "Poll shows Gideon Sa'ar on 19 seats, Blue and White barely returning to Knesset." *The Times of Israel* p. December 20. Available at: https://www.timesofisrael.com/poll-shows-gideon-saar-shoring-up-support-blue-and-white-bleeding-seats/.

Tavits, Margit. 2005. "The development of stable party support: Electoral dynamics in post-communist Europe." *American Journal of political science* 49(2):283–298.

Tavits, Margit. 2008. "Party systems in the making: The emergence and success of new parties in new democracies." *British journal of political science* 38(1):113–133.

Walther, Daniel and Johan Hellström. 2019. "The verdict in the polls: how government stability is affected by popular support." *West European Politics* 42(3):593–617.

Warwick, Paul V. 2012. "Dissolvers, disputers, and defectors: the terminators of parliamentary governments." *European Political Science Review* 4(2):263–281.

Warwick, Paul V and James N Druckman. 2001. "Portfolio salience and the proportionality of payoffs in coalition governments." *British journal of political Science* 31(4):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.

Zielińska, Karolina. 2020. "The grand coalition government in Israel. New faces of the political crisis.".

Zwick, Rami, Amnon Rapoport and John C Howard. 1992. "Two-person sequential bargaining behavior with exogenous breakdown." *Theory and Decision* 32(3):241–268.

Appendix for

Bargaining for Longevity

Contents

A Proofs

Proposition 1 *Let* $A = (1-p)/(1-\delta(1-p))$ *and* $B = 1/(1-\delta)$. *In equilibrium,*

- *Party 1 offers* $x^{\dagger} \equiv \omega_2(1-\delta)$ *and both parties never leave in equilibrium if*

$$\omega_2 < B - A \quad \textit{and} \quad \omega_1 + \omega_2 < B.$$

- *Party 1 offers* $x^{\ddagger} \equiv (1-\delta(1-p))\omega_2/1-p$ *and Party 1 will leave in equilibrium if*

$$\omega_2 < \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} \quad \textit{and} \quad \omega_1 + \omega_2 > B.$$

- *Party 1 offers* 0 *and Party 2 will leave in equilibrium if*

$$\omega_1 < A \quad \textit{and} \quad \omega_2 > B - A.$$

- *Party 1 offers* 0 *and both parties will leave in equilibrium if*

$$\omega_1 > A \quad \textit{and} \quad \omega_2 > \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} \quad \textit{and} \quad \omega_1 + \omega_2 > B.$$

Proof: Not leaving is a weakly dominant strategy when $\omega_i^t = 0$. Therefore, there are four possible strategy profiles: 1) *both never leave*, 2) *Party 1 will leave* when $\omega_1^t = \omega_1$ and Party 2 never leaves, 3) Party 1 never leaves and *Party 2 will leave* when $\omega_2^t = \omega_2$, and 4) *both will leave* when $\omega_i^t = \omega_i$.

1. Consider the strategy profile where *both parties never leave* for all ω_i^t. Let V and W respectively denote Party 1 and Party 2's continuation values. Then, they satisfy the following Bellman equations:

   $$V = 1 - x + \delta V \quad \text{and} \quad W = x + \delta W.$$

   The solutions are

   $$V = \frac{1-x}{1-\delta} \quad \text{and} \quad W = \frac{x}{1-\delta}.$$

   Conditions for such a strategy profile are as follows:

   $$\omega_1 < 1 - x + \delta V \quad \text{and} \quad \omega_2 < x + \delta W.$$

It follows that offer x must be moderate to remove any incentive to unilaterally deviate from this strategy profile. In other words,

$$(1-\delta)\omega_2 < x < 1-(1-\delta)\omega_1.$$

2. Consider the strategy profile where *Party 1 will leave* when $\omega_1^t = \omega_1$ and *Party 2 never leaves* for all ω_2^t. Then, they satisfy the following Bellman equations:

$$V = (1-p)(1-x+\delta V) + p\omega_1 \quad \text{and} \quad W = (1-p)(x+\delta W).$$

The solutions are

$$V = \frac{(1-p)(1-x)+p\omega_1}{1-\delta(1-p)} \quad \text{and} \quad W = \frac{(1-p)x}{1-\delta(1-p)}.$$

Conditions for such a strategy profile are as follows:

$$\omega_1 > 1-x+\delta V \quad \text{and} \quad \omega_2 < (1-p)(x+\delta W).$$

It follows that offer x must be sufficiently large. In other words,

$$x > \max\left\{1-(1-\delta)\omega_1, \frac{(1-\delta(1-p))\omega_2}{1-p}\right\}.$$

3. Consider the strategy profile where *Party 1 never leaves* for all ω_1^t and *Party 2 will leave* when $\omega_2^t = \omega_2$. Then, they satisfy the following Bellman equations:

$$V = (1-p)(1-x+\delta V) \quad \text{and} \quad W = (1-p)(x+\delta W) + p\omega_2.$$

The solutions are

$$V = \frac{(1-p)(1-x)}{1-\delta(1-p)} \quad \text{and} \quad W = \frac{(1-p)x+p\omega_2}{1-\delta(1-p)}.$$

Conditions for such a strategy profile are as follows:

$$\omega_1 < (1-p)(1-x+\delta V) \quad \text{and} \quad \omega_2 > x + \delta W.$$

It follows that offer x must be sufficiently small. In other words,

$$x < \min\left\{1 - \frac{(1-\delta(1-p))\omega_1}{1-p}, (1-\delta)\omega_2\right\}.$$

4. Consider the strategy profile where *both parties will leave* when $\omega_i^t = \omega_i$. Then, they satisfy the following Bellman equations:

$$V = (1-p)^2(1-x+\delta V) + p\omega_1 \quad \text{and} \quad W = (1-p)^2(x+\delta W) + p\omega_2.$$

The solutions are

$$V = \frac{(1-p)^2(1-x) + p\omega_1}{1-\delta(1-p)^2} \quad \text{and} \quad W = \frac{(1-p)^2 x + p\omega_2}{1-\delta(1-p)^2}.$$

Conditions for such a strategy profile are as follows:

$$\omega_1 > (1-p)(1-x+\delta V) \quad \text{and} \quad \omega_2 > (1-p)(x+\delta W).$$

It follows that offer x must be moderate. In other words,

$$1 - \frac{(1-\delta(1-p))\omega_1}{1-p} < x < \frac{(1-\delta(1-p))\omega_2}{1-p}.$$

These four cases together are exhaustive but not mutually exclusive. More specifically, the first (*both never leave*) and the fourth (*both will leave*) cases may overlap - the same offer x can lead to multiple equilibria. I assume that *both parties never leave* in such a case. Since Party 1's continuation value V is decreasing in offer x for all outcomes, Party 1's optimal choice of x conditional on a fixed outcome is to choose a minimum x such that results in the same outcome. Since x is between 0 and 1, such x may or may not be feasible depending on parameters $\omega_1, \omega_2, \delta$, and p. After identifying the feasible minimum offer for each outcome, I compare the corresponding utilities to derive the optimal offer and the subsequent equilibrium outcome in Proposition 1. ∎

Proposition 2 *Let x^* be Party 1's optimal offer in equilibrium as a function of exogenous outside option ω_1. Conditional on sufficiently low outside option of Party 2, $\omega_2 < (1-p)/(1-\delta(1-p))$, there always exists some $\widehat{\omega}_1$ such that*

$$\lim_{\omega_1 \to \widehat{\omega}_1^-} x^*(\omega_1) < \lim_{\omega_1 \to \widehat{\omega}_1^+} x^*(\omega_1).$$

Proof: From Proposition 1, note that (1) neither $x^\dagger$ nor $x^\ddagger$ depends on ω_1 and (2) $x^\ddagger$ is always greater than $x^\dagger$. Therefore, the optimal offer as a function of ω_1 is a piecewise constant function of which the value discontinuously switches as the equilibrium outcome changes. In particular, consider the second equilibrium. I rewrite the conditions as follows:

$$\omega_1 > \max\left\{B - \omega_2, C \equiv \frac{(1-\delta(1-p)^2)\omega_2 - Ap}{A\delta p^2}\right\} \quad \text{and} \quad \omega_2 < A.$$

For the optimal offer to be $x^\ddagger$, ω_1 must be sufficiently high conditional on ω_2 being sufficiently low. Furthermore, the threshold for ω_1 is always greater than 0 for all values of ω_2, p, and δ. Below the threshold, the optimal offer is either 0 or $x^\dagger$, which are smaller than $x^\ddagger$. Above the threshold, the optimal offer is $x^\ddagger$. Therefore, the left-hand limit of x^* at the threshold is always smaller than the right-hand limit of x^* conditional on $\omega_2 < A$. ∎

Corollary 1 *Party 1's optimal offer x^* in equilibrium is larger than half when*

1. *Party 1 concedes to stay and $\omega_2 > 1/(2-2\delta)$.*
2. *Party 1 concedes to leave and $\omega_2 > (1-p)/(2(1-\delta(1-p)))$.*

Proof: From Proposition 1, it directly follows that Party 2's outside option should be sufficiently low ($\omega_2 < \widetilde{\omega}_2 = B - A$) for the optimal offer to be positive ($x^\dagger > 0$). This is when *Both never leave* and *1 will leave*. In the *Both never leave* equilibrium, $x^\dagger$ is greater than half when $\omega_2 > 1/(2-2\delta)$; in the *1 will leave* equilibrium, $x^\dagger$ is greater than half when $\omega_2 > (1-p)/(2(1-\delta(1-p)))$. In other words, ω_2 needs to be sufficiently low but not too low for Party 1 to optimally offer more than half in equilibrium. ∎

Proposition 3 *Let EU_2^* be Party 2's expected utility in equilibrium as a function of exogenous outside option ω_2. Then, there always exists $\widehat{\omega}_2$ that satisfies*

$$\lim_{\omega_2 \to \widehat{\omega}_2^-} EU_2^*(\omega_2) > \lim_{\omega_2 \to \widehat{\omega}_2^+} EU_2^*(\omega_2).$$

Proof: From Proposition 1, we know that the optimal offer and equilibrium outcome depends on ω_2. Specifically, there are largely three cases of how the equilibrium shifts.

1. If $\omega_1 < A$, then equilibrium shifts from *Both never leave* to *2 will leave* at $\omega_2 = B - A$. The utility discontinuously drops.

2. If $\omega_1 > A$ and $\min\{(Ap + A\delta p^2 \omega_1)/(1 - \delta(1-p)^2), A\} < B - \omega_1$, then equilibrium shifts from *Both never leave* to *Both will leave* at $\omega_2 = B - \omega_1$. The utility discontinuously drops.

3. If $\omega_1 > A$ and $\min\{(Ap + A\delta p^2 \omega_1)/(1 - \delta(1-p)^2), A\} > B - \omega_1$, then equilibrium shifts from *1 will leave* to *Both will leave* at $\min\{(Ap + A\delta p^2 \omega_1)/(1 - \delta(1-p)^2), A\}$. The utility discontinuously drops.

∎

B Additional Extension 1: Extracting from Party 2

In this section, I relax the assumption on Party 1's choice of x. More specifically, I allow Party 1 to choose any $x \in \mathbb{R}$ instead of from an interval $[0,1]$. In particular, the negative value of x represents an *extraction* by Party 1. If Party 1 could set a negative x, i.e., demand $|x|$ amount from Party 2 in each period, will things play out differently? Party 1 does have a unilateral proposer power in the model, but technically Party 2 has a veto power in the sense that it can leave from the very first period in the maintenance stage. If he leaves in the first period, Party 2 will receive his draw in that period and the partnership will end, meaning that Party 1's "unfair" allocation of resources won't affect his payoff in any way. It follows from this reasoning that with negative x, Party 2 might leave right away, especially given that the minimum outside option payoff he can get is 0. However, the analysis shows that this may not be the case. To keep the model parsimonious, I assume a homogeneous outside option, i.e., $\omega = \omega_1 = \omega_2$. Below I summarize equilibrium outcomes and their conditions.

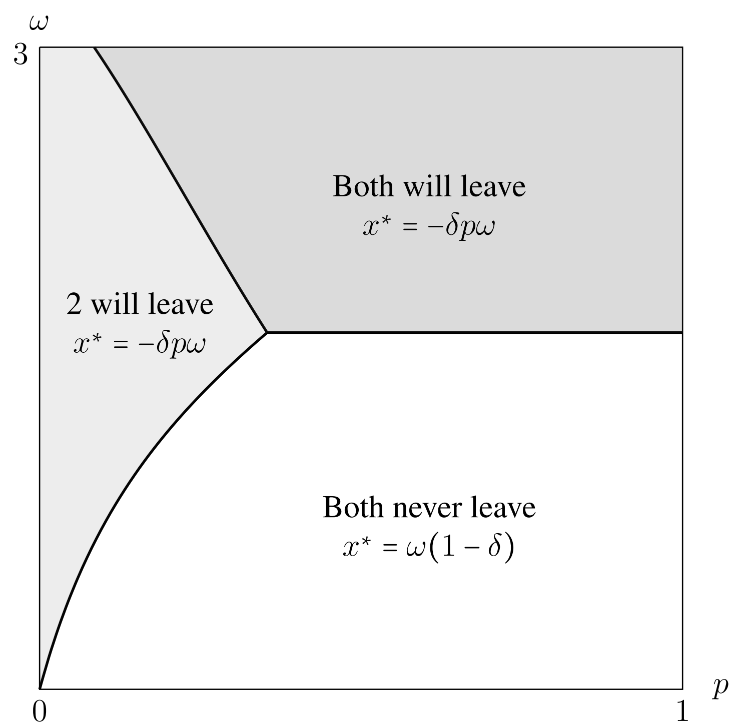


Figure B.1: Equilibrium Outcomes with Extraction
$\delta = 0.7$

1. Party 1 offers $\omega(1-\delta)$ and *both parties never leave* in equilibrium. This is when

$$\omega < \min\left\{\frac{1}{2(1-\delta)}, \frac{p}{(1-d)(1-d(1-p)^2)}\right\}.$$

2. Party 1 offers $-\delta p\omega$ and *Party 2 will leave* in equilibrium. This is when

$$\frac{p}{(1-d)(1-d(1-p)^2)} < \omega < \frac{1-p}{1-\delta(1-p^2)}.$$

3. Party 1 offers $-\delta p\omega$ and *both parties will leave* in equilibrium. This is when

$$\omega > \max\left\{\frac{1}{2(1-\delta)}, \frac{1-p}{1-\delta(1-p^2)}\right\}.$$

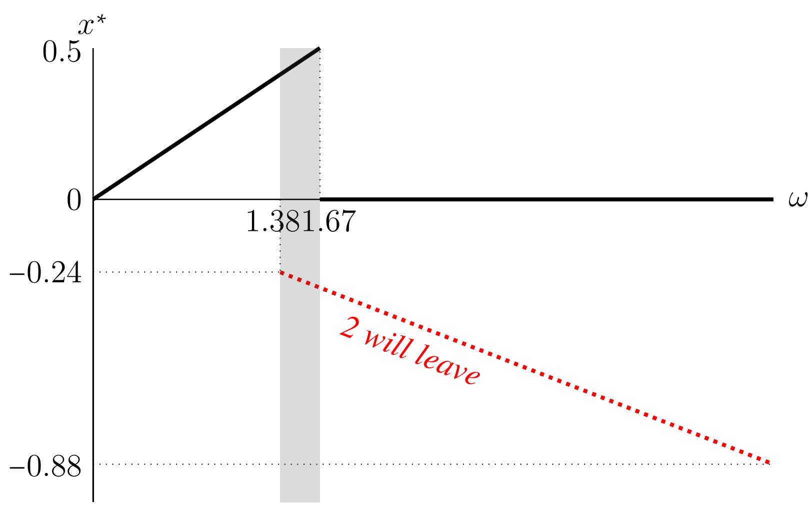


Figure B.2: Optimal Compromise x^* with Extraction
$\delta = 0.7$, $p = 0.25$

Figure B.1 illustrates the results. Somewhat surprisingly, we observe an equilibrium where Party 1 offers $x^* = -\delta p\omega < 0$ when ω is sufficiently high and Party 2 does not leave conditional on $\omega_2^t = 0$. In other words, even when Party 1 demands $|x|$ from Party 2, the partnership still lasts for a positive amount of period; this is because Party 2 is willing to pay the cost to wait for a potential high draw of outside option ω.

Results further show that parties are indeed more likely to leave the coalition in this version of the model, but only to a very small margin. As we see in Figure B.2, Party 2's behavior changes only in the gray region. Under these conditions, Party 2 never leaves in the baseline model but leaves after drawing a high outside option in this extension. However, Party 2's payoff is strictly worse off than in the baseline model because Party 1 can propose a negative x instead of 0.

C Additional Extension 2: Correlated Outside Options

In this extension, I relax the assumption on the *distribution* of outside option ω_i^t. Let r be the conditional probability of outside option draws $Pr(\omega_i^t = \omega | \omega_j^t = \omega)$, as can be seen in Table C.1. Positive correlation ($r > p$) means that if Party 1 draws ω_1 in a period, Party 2 is also more likely to receive that value and vice versa; if negatively correlated ($r < p$), a higher draw of outside option for Party 1 means that Party 2 is less likely to get one and vice versa. If $r = p$ the two are independent. I assume a homogeneous outside option.

	$\omega_2^t = 0$	$\omega_2^t = \omega$
$\omega_1^t = 0$	$1 - 2p + pr$	$p(1-r)$
$\omega_1^t = \omega$	$p(1-r)$	pr

Table C.1: Joint Distribution of Outside Option Draws

I summarize the equilibrium conditions below.

1. Party 1 offers $(1-\delta)\omega$ and *both parties never leave* in equilibrium. This is when

$$\omega \quad < \min\left\{\frac{1}{2(1-\delta)}, \frac{p}{(1-\delta)(1-\delta(1-p))}, \max\left\{\frac{1-r}{1-\delta(1-p)}, \frac{p(2-r)}{(1-\delta)(1-\delta+p+\delta p(2-r))}\right\}\right\}.$$

2. Party 1 offers $(1-\delta(1-p))\omega/(1-r)$ and *Party 1 will leave* in equilibrium. This is when

$$\frac{1}{2(1-\delta)} < \omega < \frac{1-r}{1-\delta(1-p)} \quad \text{and} \quad r \quad < 2 - \frac{1-\delta(1-p)^2}{p}.$$

3. Party 1 offers 0 and *Party 2 will leave* in equilibrium. This is when

$$\min\left\{\begin{array}{c}\frac{1}{2(1-\delta)}, \\ \frac{p}{(1-\delta)(1-\delta(1-p))}\end{array}\right\} < \omega < \max\left\{\begin{array}{c}\frac{1-r}{1-\delta(1-p)}, \\ \min\left\{\frac{1}{2(1-\delta)}, \frac{p(2-r)}{(1-\delta)(1-\delta+p+\delta p(2-r))}\right\}\end{array}\right\} \text{ and } r > 2 - \frac{1-\delta(1-p)^2}{p}.$$

4. Party 1 offers 0 and *both parties will leave* in equilibrium. This is when

$$\omega \quad > \max\left\{\frac{1-r}{1-\delta(1-p)}, \min\left\{\frac{1}{2(1-\delta)}, \frac{p(2-r)}{(1-\delta)(1-\delta+p+\delta p(2-r))}\right\}\right\}.$$

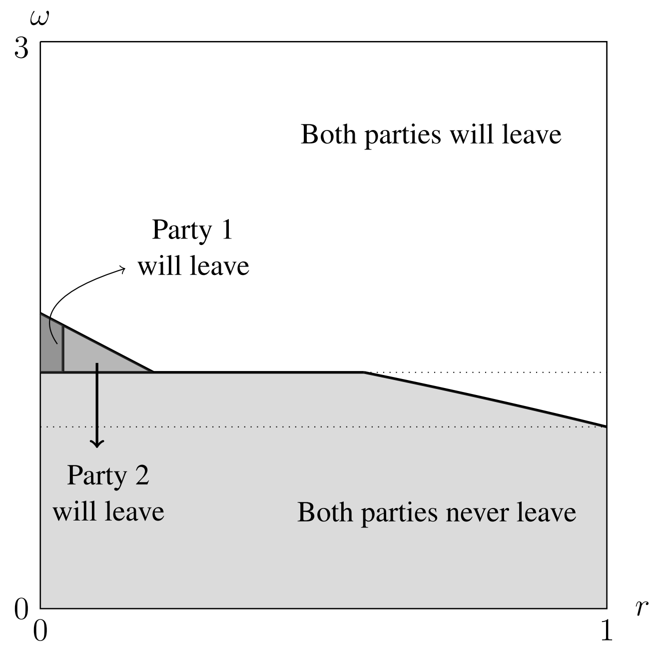


Figure C.3: Equilibrum Outcomes with Correlated Outside Options
$\delta = 0.6$, $p = 0.4$

Figure C.3 depicts the equilibrium outcomes in this version of the model. Note that the region between the two dotted lines in Figure C.3 denotes the area where the equilibrium changes from *both never leave* to *both will leave* as r increases. In other words, a more positive correlation between parties' outside options may lead to a *shorter* duration of agreement. This happens when:

$$\frac{p}{(1-\delta)(1+p-\delta(1-p))} < \omega < \min\left\{\frac{1}{2(1-\delta)}, \frac{p}{(1-\delta)(1-\delta(1-p))}\right\}.$$

Additionally, we see that there exists a region where parties are in agreement over r. Both parties are willing to increase r and let their outside options be more positively correlated when:

$$\omega \quad > \max\left\{\frac{1-r}{1-\delta(1-p)}, \min\left\{\frac{1}{2(1-\delta)}, \frac{p(2-r)}{(1-\delta)(1-\delta+p+\delta p(2-r))}\right\}\right\}.$$

One possible way is to interpret correlation parameter r as ideological diversity between parties, where high r means that parties have low ideological diversity and vice versa. In this regard, this result speaks to the studies on cabinet stability that examine the influence of a government's ideological diversity on its durability. While most works find a strong positive association between ideological polarization and the risk of cabinet termination (King et al., 1990; Laver and Schofield, 1998), some evidence conversely indicates a risk-increasing effect of minimal connected winning coalitions (Grofman, 1989; Saalfeld, 2008; Hellström and Bergman, 2011; Hu, 2014; Bergman, Ersson and Hellström, 2015; Krauss, 2018). This model implies that these mixed empirical results are expected when parties' outside option ω is sufficiently moderate; a coalition of "strange bedfellows" made up of ideologically divergent parties can in fact decrease the risk of breakdown.

D Additional Extension 3: Lower Breakdown Costs

I have assumed throughout the paper that a party's defection is always costly to the other party who had decided to stay. However, despite having faced a new election involuntarily due to the other party's defection, a party may still have a favorable prospect in the period or enjoy some positive externality (Allers, Rienks and de Natris, 2022; So, 2023). Taking this into account, I assume in this extension that a party can still draw his or her high outside option ω_i with probability p even when the other party has defected in the given period. The payoff matrix is as follows:

Party 1 \ Party 2	$a_2^t = 0$	$a_2^t = 1$
$a_1^t = 0$	$(1-x, x)$	(ω_1^t, ω_2^t)
$a_1^t = 1$	(ω_1^t, ω_2^t)	(ω_1^t, ω_2^t)

Table D.2: Payoff Structure with Lower Breakdown Costs

I summarize the equilibrium conditions below.

1. Party 1 offers $x^\dagger$ and *both parties never leave* in equilibrium. This is when

$$\omega_2 < \frac{p(1-(1-\delta)p\omega_1)}{(1-\delta)(1-\delta(1-p))} \quad \text{and} \quad \omega_2 < \frac{1}{1-\delta} - \omega_1.$$

2. Party 1 offers 0 and *both parties will leave* in equilibrium. This is when

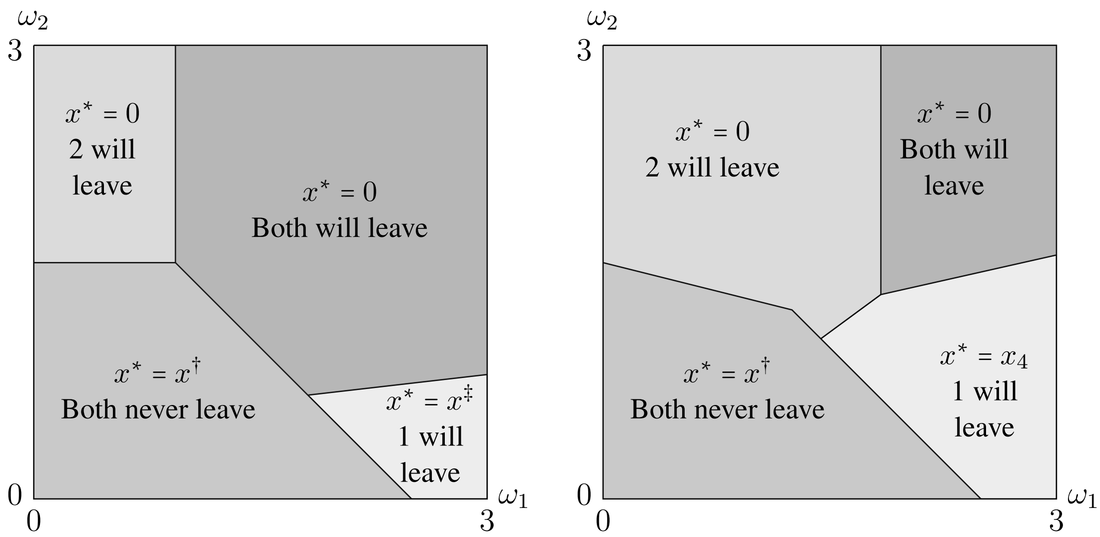
$$\omega_1 > \frac{1}{1-\delta(1-p+p^2)} \quad \text{and} \quad \omega_2 > \min\left\{\frac{1}{1-\delta(1-p+p^2)}, \frac{p(1+\delta p\omega_1)}{(1-\delta(1-p)^2)(1-\delta+\delta(1-p)p)}\right\}.$$

3. Party 1 offers $(1-\delta(1-p(1-p)))\omega_2$ and *Party 1 will leave* in equilibrium. This is when

$$\frac{1}{1-\delta} - \omega_1 < \omega_2 < \min\left\{\frac{p(1-(1-\delta)p\omega_1)}{(1-\delta)(1-\delta(1-p))}, \frac{p(1+\delta p\omega_1)}{(1-\delta(1-p)^2)(1-\delta+\delta(1-p)p)}, \frac{p\omega_1}{1-\delta+\delta(1-p)p}\right\}.$$

4. Party 1 offers 0 and *Party 2 will leave* in equilibrium otherwise.

Figure D.4 compares this extension with the baseline model where the defected party always receives 0. Intuitively, with the relaxed assumption, we observe that *unilateral* defection is more



(a) Baseline Model

(b) Lower Breakdown Costs

Figure D.4: Comparison of Equilibrium Outcomes
$\delta = 0.6$, $p = 0.4$

common than in the baseline model. This is coming from the fact that now parties are less induced to leave when the other party leaves since the party can still draw his or her high outside option with positive probability. Further note that $x^\ddagger$ is always greater than x_4. This is because it takes a larger offer to convince Party 2 to stay in the agreement, given his risk of receiving 0 after Party 1's defection.

E Additional Extension 4: Incorporating Audience Costs

In this extension, I add a parameter $c \in (0, \omega)$ that captures the audience cost that the defector incurs from abandoning the partnership. Below are the parties' payoffs in this version of the model; I assume homogeneous ω.

		Party 2: $a_2^t = 0$	Party 2: $a_2^t = 1$
Party 1	$a_1^t = 0$	$(1 - x, x)$	$(\omega^t, \omega^t - c)$
Party 1	$a_1^t = 1$	$(\omega^t - c, \omega^t)$	$(\omega^t - c, \omega^t - c)$

Table E.3: Payoff Structure with Audience Costs

Note that when we assume the payoff structure to be identical to the baseline model, adding c does not affect any of the equilibrium outcomes so long as c is not too high, as this simply increases the parties' disincentives to leave by c. In order to make the game non-trivially different from the baseline model, I adopt the payoff structure in Appendix D where parties have an incentive to wait and "free ride" on the opponent's decision to end the coalition even if a positive outside option is drawn. As in the baseline model, there are four cases: 1) *both never leave*, 2) *Party 1 will leave* when $\omega_1^t = \omega_1$ and Party 2 never leaves, 3) Party 1 never leaves and *Party 2 will leave* when $\omega_2^t = \omega_2$, and 4) *both will leave* when $\omega_i^t = \omega_i$. There also are two types of subgame equilibrium multiplicity in this version:

1. Cases 1 and 2 may coexist. As in the baseline model, I assume that Case 1 prevails.
2. Cases 3 and 4 may coexist. The multiplicity range is symmetric around 1/2 with respect to x. Therefore, I assume that Case 3 prevails when $x > 1/2$ and Case 4 prevails when $x < 1/2$. In other words, a more dissatisfied party will leave in equilibrium.

I summarize the equilibrium conditions below.

1. Party 1 offers $(1 - \delta)(\omega - c)$ and *both parties never leave* in equilibrium. This is when

$$\omega < \min\left\{ \frac{c(-1+\delta)(1+\delta(-1+p)) - p}{(-1+\delta)(-1+\delta(-1+p)+p^2)}, c + \frac{1}{2-2\delta} \right\}.$$

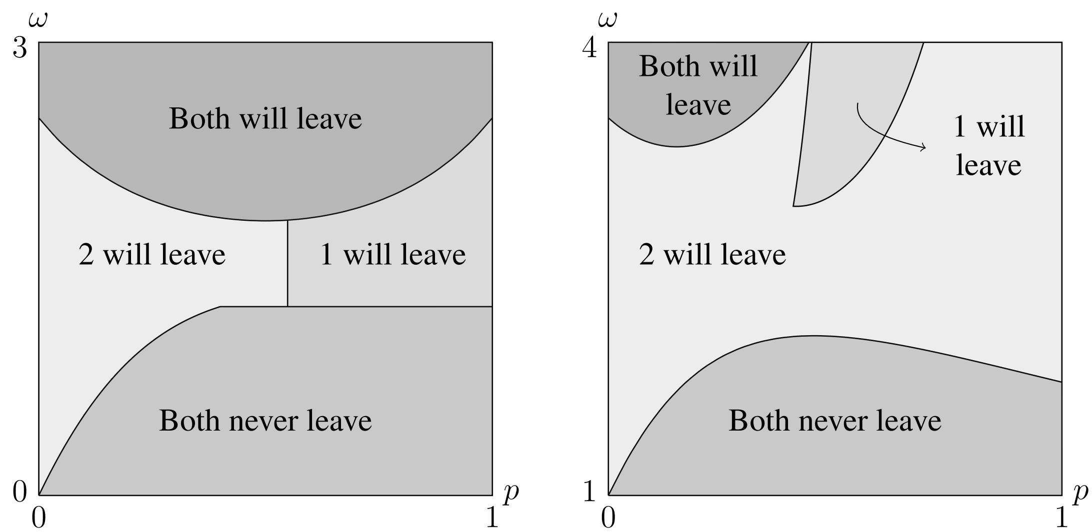
2. Party 1 offers 0 and *both parties will leave* in equilibrium. This is when

$$\omega > \frac{1 + c + c\delta(-1 + p) - p}{(-1 + p)(-1 + \delta + \delta(-1 + p)p)}.$$

3. Party 1 offers $\left(\delta + \frac{1}{-1+p}\right) + (1 - \delta(1 - p(1 - p)))\omega$ or $\frac{1}{2}$ and *Party 1 will leave* in equilibrium. This is when

$$\max\left\{-\frac{c}{-1+p} + \frac{1}{2p}, c + \frac{1}{2-2\delta}\right\} < \omega < \frac{1+c+c\delta(-1+p)-p}{(-1+p)(-1+\delta+\delta(-1+p)p)} \quad \text{and} \quad c > \frac{(-1+\delta+p+\delta(-1+p)p)\omega}{-1+\delta}.$$

4. Party 1 offers 0 and *Party 2 will leave* in equilibrium otherwise.



(a) No cost ($c = 0$)

(b) Audience cost ($c = 1$)

Figure E.5: Comparison of Equilibrium Outcomes
$\delta = 0.6$

Figure E.5 illustrates the above result. First, Figure E.5a assumes zero cost of defecting $c = 0$. Note that the figure is different from the baseline model because of the 1) homogeneous ω assumption and 2) relaxed assumption on what parties receive given the other party's defection (payoff structure in Appendix D). Our equilibrium of interest—the buyout equilibrium—still exists in this version, more specifically when outside option ω is moderate and the probability of drawing such outside option p is high. Moderate ω, although convoluted because it represents the outside option of both parties, captures the intuition that the outside option is not too low that Party 1 wants to leave but is not too high that Party 1 can persuade Party 2 not to leave. Sufficiently high p further increases Party 1's incentive to leave.

In Figure E.5b where the cost of leaving c is 1, we observe that the results are qualitatively consistent with the baseline model, with changes to the equilibrium results in the expected direction. Notably, the region where Party 1 proposes $x = 0$ and Party 2 leaves increases. This is because Party 1 is generally less incentivized to offer a compromise to Party 2, as the presence of the audience cost deters Party 2 from defecting to a certain degree. Party 2, following an offer of 0, leaves after he draws a favorable outside option. The buyout equilibrium is also present in this version. Now, outside option ω has to be higher to sustain this equilibrium, as Party 1 also has to pay the cost $c = 1$ in order to leave; probability p needs to be moderate, as Party 1 is reluctant to offer Party 2 anything when p is low and she is unable to persuade Party 2 to stay if it is too high. Other results are in accordance with the baseline model.

F Additional Extension 5: Preferences for Commitment

I additionally consider a version of the model where only Party 2 can decide whether or not to withdraw from the partnership in the maintenance stage. Substantively, we can interpret this as parties facing asymmetric audience costs where Party 1's cost is considerably larger than that of Party 2.[1] For simplicity, I omit explicit considerations of audience costs and simply compare the case where both parties can defect from the partnership (baseline model) with the one where only Party 2 can choose to leave (commitment model). Below I first lay out a complete equilibrium analysis of the commitment model.

Now the maintenance stage is Party 2's dynamic discrete choice problem. I first solve for Party 2's optimal stationary strategy with respect to ω_2^t, which depends on x. Then, Party 1 will choose an optimal offer x^* in the contracting stage in anticipation of Party 2's best response in the maintenance stage. Let W denote Party 2's continuation value. Party 2 prefers to leave when

$$\omega_2^t > x + \delta W.$$

It immediately follows that not leaving is a dominant strategy when $\omega_2^t = 0$. Therefore, Party 2 essentially has two different strategies: 1) never leave for all ω_2^t, and 2) leave when $\omega_2^t = \omega_2$.

1. Consider the strategy profile where Party 2 never leaves for all ω_2^t. Then, the stationary MPE requires that continuation value W satisfies the following Bellman equation:

   $$W = x + \delta W.$$

   The solution for this equation is

   $$W = \frac{x}{1-\delta}.$$

[1] If both parties are constrained to never leave the agreement, it is always a weakly dominant strategy for Party 1 to offer nothing to Party 2.

Party 2 has an incentive to employ this strategy if Party 1's offer is sufficiently large:

$$x > (1 - \delta)\omega_2.$$

2. Consider the strategy profile where Party 2 leaves when $\omega_2^t = \omega_2$. Then, the stationary MPE requires that continuation value W satisfies the following Bellman equation:

$$W = (1 - p)(x + \delta W) + p \cdot \omega_2.$$

The solution for this equation is

$$W = \frac{x + p\omega_2}{1 - \delta(1 - p)}.$$

Party 2 has an incentive to employ this strategy if the offer is sufficiently small:

$$x < (1 - \delta)\omega_2.$$

Let EU_1 be Party 1's total expected utility as a function of choice $x \in [0, 1]$. Then,

$$EU_1(x) = \begin{cases} \frac{(1-p)(1-x)}{1-\delta(1-p)} & \text{if } x < (1 - \delta)\omega_2 \\ \frac{1-x}{1-\delta} & \text{if } x > (1 - \delta)\omega_2. \end{cases}$$

Depending on exogenous parameters δ, p and ω_2, Party 1's optimal choice of offer and the subsequent equilibrium outcome are as follows:

1. Party 1 offers $x^\dagger$ and *Party 2 never leaves* in equilibrium if $\omega_2 < \widetilde{\omega}_2$,

2. Party 1 offers 0 and *Party 2 will leave* in equilibrium if $\omega_2 > \widetilde{\omega}_2$,

where

$$\widetilde{\omega}_2 \equiv \frac{p}{(1 - \delta)(1 - \delta(1 - p))}.$$

The equilibrium results for the baseline model are detailed in Proposition 2. Now I merge the conditions of both models to compare parties' utilities and establish results on Pareto optimality. There are mainly six different cases.

1. *Party 2 will leave* in both models when

$$\omega_1 < A \quad \text{and} \quad \omega_2 > B - A.$$

   Parties are indifferent between the two models. The condition requires a sufficiently low ω_1 and a sufficiently high ω_2.

2. *Both parties never leave* in both models when

$$\omega_2 < B - A \quad \text{and} \quad \omega_1 + \omega_2 < B.$$

   Parties are indifferent between the two models. The condition requires sufficiently low ω_1 and ω_2.

3. *Both parties never leave* in the commitment model and *Party 1 will leave* in the baseline model when

$$\omega_2 < \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A, B - A\right\} \quad \text{and} \quad \omega_1 + \omega_2 > B.$$

   Party 2 is indifferent between the two versions; Pareto optimality is established by Party 1's preference. If $\omega_1 < B$, Party 1 prefers the commitment model, and Party 1 prefers the baseline model otherwise.

4. *Both parties never leave* in the commitment model and *both parties will leave* in the baseline model when

$$\omega_1 > A \quad \text{and} \quad \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} < \omega_2 < B - A \quad \text{and} \quad \omega_1 + \omega_2 > B.$$

   Party 2 always prefers the commitment model. If Party 1 also prefers the commitment model, then Pareto optimality is established. This is when

$$(1-\delta)(1-\delta(1-p)^2)\omega_2 < p(2-p-(1-\delta)\omega_1).$$

The conditions require moderate ω_1 and ω_2. Party 1 prefers the baseline model otherwise; parties' preferences over the institutions diverge in this case. The conditions require moderate (but relatively higher) ω_1 and ω_2.

5. *Party 2 will leave* in the commitment model and *Party 1 will leave* in the baseline model when

$$B-A < \omega_2 < \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\} \quad \text{and} \quad \omega_1+\omega_2 > B.$$

   Both parties always prefer the baseline model; Pareto optimality is established. The conditions require a sufficiently high ω_1 and a moderate ω_2.

6. *Both parties never leave* in the commitment model and *both parties will leave* in the baseline model when

$$\omega_1 > A \quad \text{and} \quad \omega_2 > \max\left\{B-A, \min\left\{\frac{Ap + A\delta p^2\omega_1}{(1-\delta(1-p)^2)}, A\right\}\right\} \quad \text{and} \quad \omega_1+\omega_2 > B.$$

   Party 1 always prefers the baseline model, while Party 2 always prefers the commitment model; parties' preferences for institutions diverge. The conditions require sufficiently high ω_1 and ω_2.

Rearranging these conditions derives the implications stated below:

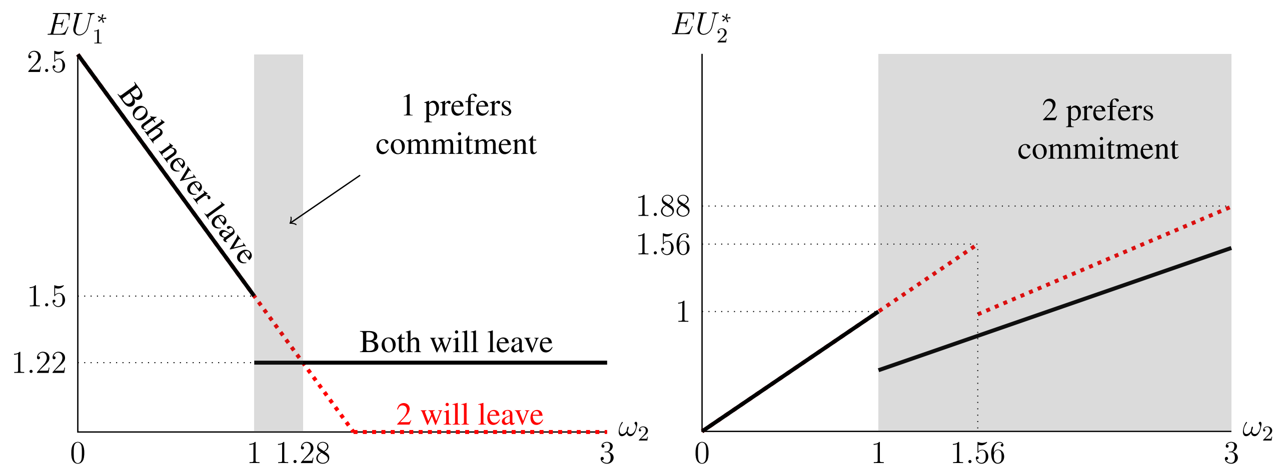
1. If either ω_1 or ω_2 is sufficiently low, parties are indifferent between the two models.

2. If both ω_1 and ω_2 are sufficiently high, parties' preferences diverge.

3. If both ω_1 and ω_2 are moderate, both parties are weakly better off in the commitment model.

4. If ω_1 is sufficiently high and ω_2 is sufficiently low, both parties are weakly better off in the baseline model.

Now consider Party 1 and Party 2's welfare in comparison with the results from the baseline model. We can observe that parties may agree on which game to play. Both parties may prefer that Party 1 commits to the partnership and be unable to leave; conversely, they may want Party 1 to have the option to leave. The red dotted lines in Figure F.6 and F.7 represent the model with commitment, while the black lines represent the results without commitment (baseline model).



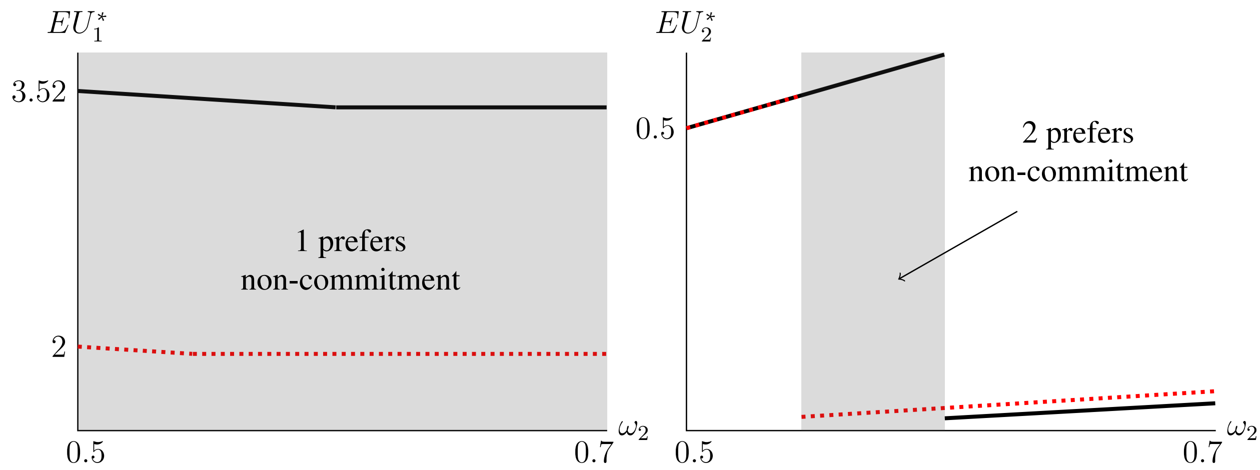
(a) Party 1

(b) Party 2

Figure F.6: Comparison of Equilibrium Expected Payoffs
$\delta = 0.6, p = 0.4, \omega_1 = 1.5$

Figure F.6 illustrates the case where both parties favor Party 1's inability to leave. From Figure F.6a, we see that Party 1 in general is better off without commitment. It would seem clear that increasing Party 1's flexibility in her choice to leave can only increase Party 1's expected payoff. Similarly, one might think that Party 2 can not be helped by Party 1's increase in flexibility. However, this possibility, if foreseen by Party 2, introduces a credibility problem that becomes more costly for Party 1. When Party 2 has a moderate outside option, he is better off receiving the continued stream of payoff in the partnership rather than taking a not-too-high outside option and leaving, but with the possibility of Party 1's "betrayal" in the extension model he is incentivized to leave. With Party 1's credible commitment, Party 2 is now willing to never leave. Party 1 may thus prefer to concede her ability to leave the partnership in return for a longer duration of the coalition. This happens when the outside options of parties are moderate (shaded region in Figure F.6a).

Figure F.7 represents an opposite case. Party 1's outside option ω_1 is very high that given these parameters, for any value of ω_2 Party 1 ultimately leaves the agreement after she draws



(a) Party 1

(b) Party 2

Figure F.7: Comparison of Equilibrium Expected Payoffs
$\delta = 0.6, p = 0.1, \omega_1 = 9.5$

ω_1. One might think that Party 2 would prefer that Party 1 commits to the relationship and never leaves, since otherwise he knows that Party 1 will leave with certainty in the future. Somewhat surprisingly, there is a region where Party 2 is better off when Party 1 is able to leave the agreement. This is closely related to the mechanism behind the buyout equilibrium (see Figure 2) where Party 1 concedes by offering Party 2 a larger share of resources in exchange for a secure exit strategy in the future. This shapes Party 2's preference for institutions, as he may prefer Party 1's ability to withdraw from the agreement since this increases her willingness to compromise.

Figure F.8 is a graphical illustration of the above results. Put together, there exist regions where parties agree on the institutional choice. When ω_1 and ω_2 are "not too low, not too high," both parties may prefer to have Party 1 commit to the partnership. Party 1 proposes more in the baseline model but prefers to do so, as this induces Party 2 to stay in the partnership longer. When ω_1 is sufficiently high but ω_2 is sufficiently low, both parties may conversely prefer that Party 1 has the ability to leave the partnership as implied by Figure F.7. Additionally, when either ω_1 or ω_2 is sufficiently low, parties are indifferent between the two games because the equilibrium outcome is perfectly identical for both models. Otherwise, parties disagree on their preferred game choice.

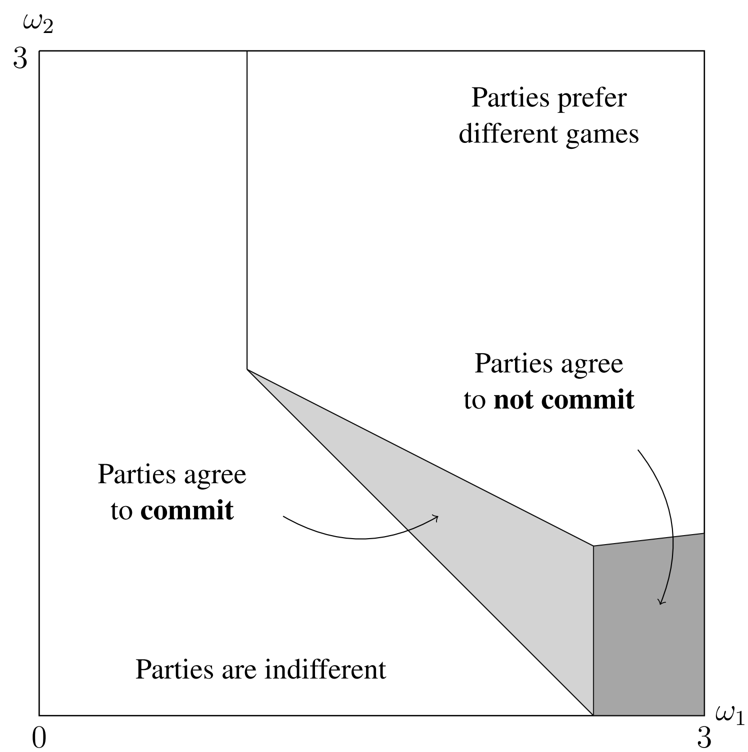


Figure F.8: Parties' Preferences Over Games
$\delta = 0.6, p = 0.4$

G Additional Extension 6: Incorporating Renegotiation

In this section, I allow Party 1 to make a second offer x' to Party 2 when he unilaterally announces that he will leave. I assume homogeneous ω; I further fix $\delta = 0.6$ and $p = 0.4$ for tractability. If Party 2 accepts the offer, each party receives $(1 - x', x')$, and the game proceeds to the maintenance stage governed by a new allocation of x'. Renegotiation succeeds with probability σ; with probability $1 - \sigma$, the game immediately ends as in the baseline model. As σ tends to zero, this extension becomes equivalent to the baseline model without renegotiation. As σ increases, renegotiation is more likely to succeed.

I solve this extension by backward induction. I first examine what the optimal offer by Party 1 and the corresponding subgame equilibrium is given that Party 2 decides to leave. Then, I analyze what the initial offer of Party 1 will be given that Party 2 can ask for renegotiation later in the bargaining process. If Party 2 announces to leave after drawing ω, Party 2 accepts the new offer x' if $x' + \delta\widehat{W}(x') > \omega$ where $\widehat{W}$ is the continuation value of renegotiation outcome given x'. If Party 2 announces to leave after drawing 0, Party 2 accepts new offer x' since $x' + \delta\widehat{W}(x') > 0$. It is always better for Party 1 to achieve any renegotiation since $1 - x' + \delta\widehat{V}(x') > 0$; in addition, Party 1 aims to maximize the LHS conditional on acceptance.

It follows that Party 1 always has the incentive to renegotiate because it is always better to prolong the game for at least one more period than to end the game with a zero payoff. Therefore, the feasibility of renegotiation solely depends on the existence of new x' that can convince Party 2 with a positive outside option to stay. I summarize the equilibrium conditions below.

1. Party 1 offers $x^\dagger$ and *both parties never leave* in equilibrium. This is when

$$\omega_2 < \min\left\{\frac{5 - 2\omega_2}{2}, \max\left\{\frac{25(1-\sigma)}{2(8-5\sigma)}, \min\left\{\frac{15}{16}, \frac{60 - 15\omega_1}{49}\right\}\right\}\right\}.$$

2. Party 1 offers 0 and *Party 2 will leave* in equilibrium; after renegotiation, Party 1 offers $x^\dagger$ and *both parties never leave*. This is when

$$\max\left\{\frac{25(1-\sigma)}{2(8-5\sigma)}, \min\left\{\frac{15}{16}, \frac{60 - 15\omega_1}{49}\right\}\right\} < \omega_2 < \frac{5 - 2\omega_1}{2}.$$

3. Party 1 offers 0 and *Party 2 will leave* in equilibrium; after renegotiation, Party 1 offers $\widetilde{x} \equiv 68\omega_2/125$ and *both parties will leave*. This is when

$$\frac{5-2\omega_1}{2} < \omega_2 < \min\left\{\frac{125}{68}, \frac{735-384\omega_1+25\sigma(25+6\omega_1)}{340\sigma}\right\}.$$

4. Party 1 offers 0 and *Party 2 will leave* in equilibrium; there is no counteroffer. This is when

$$\omega_2 > \max\left\{\frac{125}{68}, \frac{5-2\omega_1}{2}\right\} \quad \text{and} \quad \omega_1 < \frac{15}{16}.$$

5. Party 1 offers $\widehat{x} \equiv 16(5+2\sigma)\omega_2/75$ and *Party 1 will leave* in equilibrium. This is when

$$\frac{5-2\omega_1}{2} < \omega_2 < \max\left\{\begin{array}{l} \min\left\{\frac{75(1-\sigma)(25+6\omega_1)}{3920-432\sigma}, \frac{675+162\omega_1}{2288}\right\}, \\ \min\left\{\frac{375(1-\sigma)(25+6\omega_1)}{4352(5-3\sigma)}, \frac{675+162\omega_1}{3920}\right\} \end{array}\right\}.$$

6. Party 1 offers $x^{\ddagger}$ and *Party 1 will leave* in equilibrium. This is when

$$\max\left\{\frac{5-2\omega_1}{2}, \frac{675+162\omega_1}{2288}\right\} < \omega_2 < \frac{15(49-40\sigma)(25+6\omega_1)}{38416-8160\sigma}.$$

7. Party 1 offers $\bar{x} \equiv 2(227\sigma-45)/375$ and *both parties will leave* in equilibrium; after renegotiation, Party 1 offers $x^{\ddagger}$ and *Party 1 will leave*. This is when

$$\max\left\{\frac{5-2\omega_1}{2}, \frac{375(1-\sigma)(25+6\omega_1)}{4352(5-3\sigma)}\right\} < \omega_2 < \frac{675+162\omega_1}{3920}.$$

8. Party 1 offers 0 and *both parties will leave* in equilibrium; after renegotiation, Party 1 offers $x^{\ddagger}$ and *Party 1 will leave* after renegotiation. This is when

$$\max\left\{\frac{5-2\omega_1}{2}, \frac{675+162\omega_1}{3920}, \frac{75(1-\sigma)(25+6\omega_1)}{3920-432\sigma}\right\} < \omega_2 < \frac{675+162\omega_1}{2288}.$$

9. Party 1 offers 0 and *both parties will leave* in equilibrium; after renegotiation, Party 1 offers

$\widetilde{x}$ and *both parties will leave*. This is when

$$\max\left\{\begin{array}{l}\frac{5-2\omega_1}{2}, \frac{735-384\omega_1+25\sigma(25+6\omega_1)}{340\sigma}, \\ \frac{675+162\omega_1}{2288}, \frac{15(49-40\sigma)(25+6\omega_1)}{38416-8160\sigma}\end{array}\right\} < \omega_2 < \frac{125}{68}.$$

10. Party 1 offers 0 and *both parties will leave* in equilibrium given $x^* = 0$; there is no counteroffer. This is when

$$\omega_2 > \frac{125}{68} \quad \text{and} \quad \omega_1 > \frac{15}{16}.$$

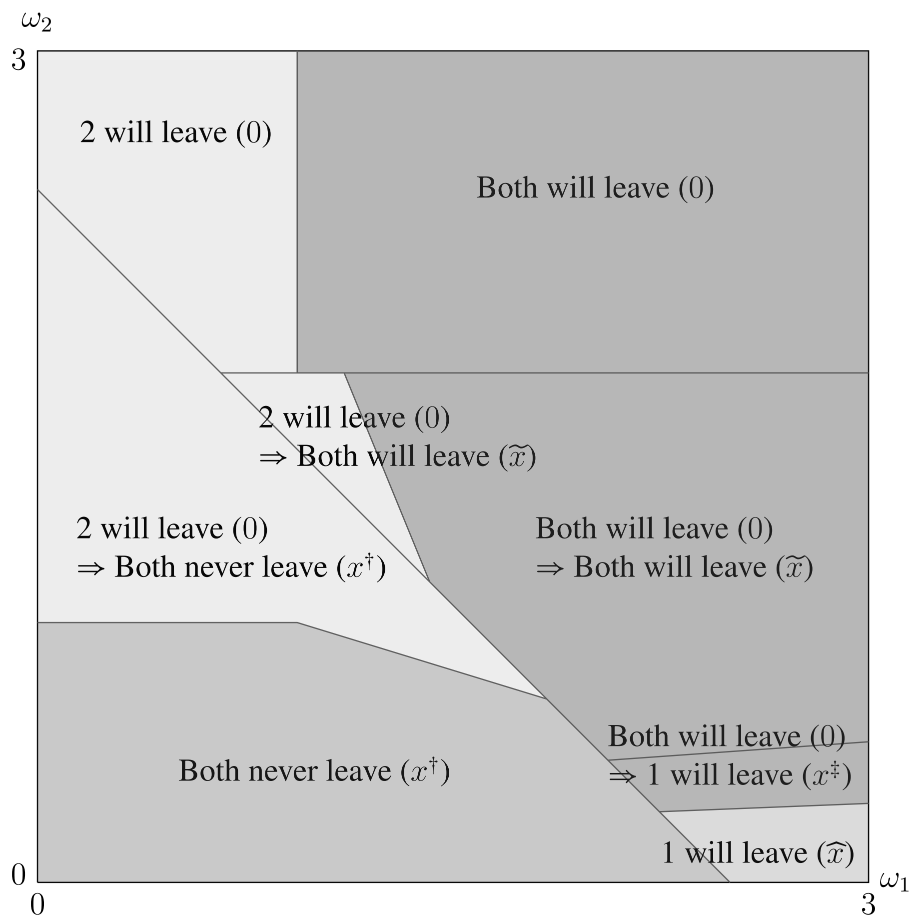


Figure G.9: Equilibrium Outcomes with Renegotiation
$\delta = 0.6, \sigma = 0.8$

Figure G.9 illustrates Party 1's optimal offer in both the initial bargaining stage and the renegotiation stage, as well as the corresponding equilibrium outcomes. Equilibria with the same initial bargaining outcomes are colored in the same shade. As expected, Party 1 offers 0 more often in this extension since she can simply offer more to Party 2 *after* Party 2 announces to leave. Successful renegotiation with $x' > 0$ after an initial offer of 0 occurs when Party 2's outside option ω_2 is moderate. Further notice that the logic of the buyout equilibrium is still present. When ω_1 is sufficiently high relative to ω_2, Party 1 in equilibrium concedes to Party 2 but leaves after drawing a high outside option. With renegotiation, however, there exists an additional equilibrium where Party 1 "buys" Party 2's cooperation only after renegotiation.

H Additional Extension 7: Continuous Outside Options

In this section, I re-solve the baseline model using a continuous distribution and show that the results extend outside the Bernoulli distribution setting. I set ω_i to be distributed continuously according to a Normal(μ, σ) distribution. I choose Normal distribution as a conservative test to examine if the results still hold for an unbounded and continuous distribution. Unfortunately, we are unable to get closed-form solutions with the distribution; I instead run simulations and report numerical solutions to provide insight into how the parameters in my model affect the equilibrium behavior of parties. Specifically, I examine the effect of changes in mean μ, which best represents the changes in the size of outside options. We first know that

1. Party 1 leaves when $1 - x + \delta V < \omega_1^t$,
2. Party 2 leaves when $x + \delta W < \omega_2^t$.

With the distributional assumption, the probability that each party leaves can be expressed as

$$P = 1 - \Phi(1 - x + \delta V; \mu_1, \sigma) \quad \text{and}$$
$$Q = 1 - \Phi(x + \delta W; \mu_2, \sigma),$$

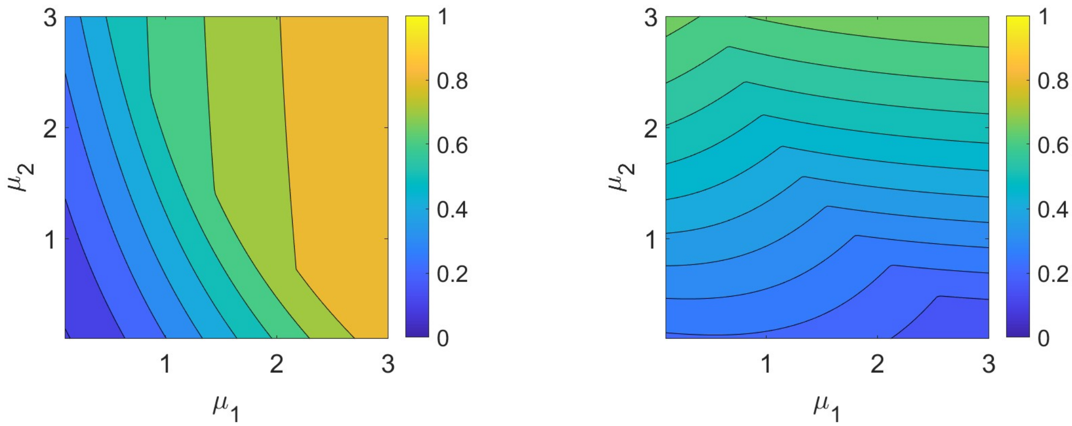
where Φ is the cumulative density function (CDF) of Normal distribution given μ_i and σ. In equilibrium, continuation value V and W must satisfy the following Bellman equations:

$$V = (1 - P)(1 - x + \delta V) + P \cdot E[\omega_1 | \omega_1 > 1 - x + \delta V] \quad \text{and}$$
$$W = (1 - Q)(x + \delta W) + Q \cdot E[\omega_2 | \omega_2 > x + \delta W].$$

Below I provide numerical results for parameter values $\delta = 0.6$ and $\sigma = 1$.

First, note that by assuming that outside options are normally distributed, draws of outside options can be infinitely large numbers. Equilibria where parties never leave are therefore impossible because there is always a positive probability that the outside option is better than what Party 1 can offer.[2] Otherwise, however, the main dynamics of the game do not largely change relative to the

[2] See Kayser (2005) for a model of strategic election timing that uses a dynamic optimal stopping



(a) Probability that Party 1 Leaves

(b) Probability that Party 2 Leaves

Figure H.10: Probability that Parties Leave
$\delta = 0.6, \sigma = 1$

baseline model. From Figure H.10a and H.10b, we can see that when μ_1 and μ_2 are both low, the probability of leaving is low for both parties (which is the region where *both parties never leave* in the baseline model; see Figure 1). When μ_1 is high but μ_2 is low, the probability of leaving is high for Party 1 but low for Party 2 (*Party 1 will leave* in the baseline model). When μ_1 is low but μ_2 is high, the probability of leaving is low for Party 1 but high for Party 2 (*Party 2 will leave* in the baseline model). Lastly, when μ_1 and μ_2 are both high, the probability of leaving is high for both parties (*both will leave* in the baseline model).

problem with continuous shocks.