Now or Later? A Dynamic Analysis of Presidential Appointments*

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Abstract
Observing substantial variations in Senate confirmation durations, existing studies have tried to explain when the Senate takes more or less time to confirm presidential nominees. However, they are unsatisfactory in that they do not appropriately deal with the Senate’s dynamic decision making. To improve on existing literature, I develop a dynamic model of presidential appointments in which the Senate decides whether to delay as well as whether to confirm the nominee. The model generates important implications for confirmation duration: (i) when the ideological distance between the president and the Senate increases, it takes longer for the Senate to confirm the nominee, (ii) the more the president is popular, the longer it takes for the Senate to confirm the nominee, and (iii) the effect of ideological distance between the president and the Senate depends on presidential popularity. Empirical analysis of appellate court nominations from 1977-2004 supports the implications generated by the model.

1 Introduction

“The judiciary depends not only on funding, but on the judges, to carry out that mission.... Over many years, however, a persistent problem has developed in the process of filling judicial vacancies. Each political party has found it easy to

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turn on a dime from decrying to defending the blocking of judicial nominations, depending on their changing political fortunes.” (Roberts 2010, p.7)

The quote above indicates that the Senate often does not act fast to confirm judicial nominees despite the urgency of filling vacancies. At the time when Chief Justice Roberts wrote this year-end report, there were 96 vacancies among 876 Article III judgeships in the Federal Judiciary. In fact, his predecessor, William Rehnquist, had already expressed a similar concern more than 10 years ago, writing in his 1998 annual report that “vacancies cannot remain at such high levels indefinitely without eroding the quality of justice.” (Rehnquist 1998)

While it is apparent that there are growing vacancies due to confirmation delays, however, there are still nominations which were processed quickly. For example, William Jay Riley was nominated by President George W. Bush on May 23, 2001 to a seat vacated by Judge Clarence Arlen Beam. He was swiftly confirmed 97-0 by the Senate just over two months later on August 2, 2001. Observing these variations in durations of confirmation processes raises a question: Why do some nominations gain quick confirmation while others have to wait for months or even years to be confirmed?

Existing studies suggest various conditions under which delay occurs. First, the ideological disagreement between the president and the Senate may cause delays. When the ideological gap between the president and the Senate is great, it is less likely for the president to make a nomination which makes the Senate better off. Thus, the Senate might
be reluctant to confirm the nomination swiftly (McCarty and Razaghian 1999; Shipan and Shannon 2003; Primo, Binder and Maltzman 2008). Second, senators may block nominations to use them as leverage in bargaining over another appointments, legislative bills, the budget or executive branch acts (Binder and Maltzman 2002; Console-Battilana and Shepsle 2009; Goldman 1997; Shipan and Shannon 2003). Next, the Senate may take more time to make its decision if the nominee is underqualified (Epstein, Lindstadt, Segal and Westerland 2006; Martinek, Kemper and Winkle 2002). Finally, the Senate sometimes uses delay as a purposeful strategy to defeat presidential nominees (Bell 2002; Bond, Fleisher, and Krutz 2009).

Although previous studies provide valuable insights on why delay occurs, they are unsatisfactory for two reasons. First, these studies are often based on static games of appointments. Static appointment games (e.g., Hammond and Hill 1993; Moraski and Shipan 1999; Nokken and Sala 2000; Primo, Binder and Maltzman 2008; Rohde and Shepsle 2007) focus on the final decision of the Senate, rather than on the confirmation process. They explain how the president chooses his nominee when taking account the Senate’s preference. Since these models are static, their explanations for delay cannot reflect the dynamic process of the Senate’s decision-making. For example, imagine there are two vacancies, one to an extremely liberal circuit court and the other to an extremely conservative one. If the president is conservative and the Senate is liberal and both are less extreme than the courts, what would happen? Since both are less extreme than the court, it is easy to see that the president will nominate moderate people to make these courts less extreme. The president would want to avoid any
delay if possible, because the courts with the newly appointed judges will produce policies closer to his ideological view than before. However, the cost of a delayed confirmation is not the same for the two courts. The president’s cost of a delayed confirmation to the liberal court is much larger than his cost from a delayed confirmation to the conservative court because the liberal court will continue to produce extremely liberal decisions until the nomination gets through the Senate confirmation process. By similar logic, the Senate will find it much more costly to block the nomination for the conservative court than for the liberal one. Thus, it is not only the decision whether to confirm the nomination, but also the decision on when to confirm it that affects the president’s and the Senate’s utilities. The incentives and disincentives to delay cannot be captured in static models. Therefore, explaining what decides confirmation duration requires a dynamic model.

The other reason that existing theories are unsatisfactory is that they are not very successful in explaining how the factors causing delays are related to each other. For example, the Senate’s incentives to hold nominations hostage to use as bargaining leverage in other issue dimensions may vary depending on the Senate’s ideological distance from the president. Or, the effect of the ideological distance between the president and the Senate may depend on other factors such as the president’s popularity.

To systematically analyze the incentives for the Senate’s foot-dragging and the choice of the president facing such a Senate, I develop a dynamic model of presidential appointments and investigate the effects of various factors and their interactions on delays. To capture the dynamic feature of the confirmation process, there are two periods with two players, the
president and the Senate. In the model, after the president nominates someone, the Senate first decides whether to make its final decision at the first period or the second period, and then decides whether to confirm at the decided time period. The Senate pays some costs if it rejects the nomination. It is assumed that the Senate’s rejection cost is positively correlated with the president’s popularity (Bond, Fleisher and Krutz 1998, 2009; Johnson and Roberts 2004).

Following the insights from existing literature, the model incorporates the incentives for the Senate to delay nomination in order to gain leverage when bargaining over issues such as another appointments, legislative bills, the budget or executive branch acts (Binder and Maltzman 2002; Console-Battilana and Shepsle 2009; Goldman 1997; Shipan and Shannon 2003). Indeed, there is plentiful anecdotal evidence implying such a motivation for delay. First of all, there are many cases in which nominations are delayed for a long period without good reason and then confirmed unanimously. For example, Albert Diaz of North Carolina was unanimously confirmed to the Fourth Circuit after almost 11 months of delay. Why did the Senate delay so long if no one actually opposed the nomination? A potential answer is that the Senate waited until an additional bargaining opportunity arose. Second, the president often renominates the same individual who failed to gain confirmation in the previous Senate even when the new Senate is more hostile. Surprisingly, however, sometimes these individuals gain confirmation by the new Senate. For instance, James L. Dennis was first nominated by President Clinton during the 103rd Congress in which the Democratic party occupied 57 seats among 100 in the Senate. However, he failed to gain confirmation by the
end of the 103rd Congress. Clinton renominated him in the new Congress in which the Democratic party had only 47 seats. Interestingly, the nomination was successfully confirmed after eight months. Finally, senators sometimes hold dozens or even hundreds of nominees hostage until their demands are satisfied. On April 13, 2011, for instance, Republican Senator Lindsey Graham vowed to block President Obama’s judicial nominations over $40,000 in port funding. In the end, Majority Leader Harry Reid had to promise to provide the money to escape the threat. All these incidents indicate that confirmation delays are not all about ideology. The Senate sometimes has incentives to delay the confirmation, hoping for an additional gain from bargaining in another issue dimension. And to get his nominees confirmed, the president may have to make concessions in other policy areas.

To incorporate the Senate’s incentives to block nominations for additional bargaining gains, I assume that if a decision is delayed until the second period, the president yields a portion of his ideological gain from the new appointment to the Senate with positive probability. By incorporating the possibility of future bargaining opportunities in the model, I can systematically analyze how this affects the president’s choice of nominees and the Senate’s decision.

The model produces empirically testable implications. First, as argued in previous studies, when the ideological distance between the president and the Senate increases, it takes longer for the Senate to confirm the nominee. While this prediction is found in existing studies, the model provides richer insights by analyzing a dynamic choice problem. (See the discussion after Proposition 2.3.) Next, the model predicts that the more popular the
president is, the longer it takes for the Senate to confirm the nominee. Although it may seem counter-intuitive, the model shows that when the president is more popular, he tries to maximize his policy gain even when the cost of delay is quite big. As a result, the Senate is more likely to delay its decision. Third, and probably most interestingly, the effect of the ideological distance between the president and the Senate depends on presidential popularity. This implication is new in the literature. As mentioned above, such an interaction is not easy to derive without building a formal model. Using data on appellate court nominations from 1977-2004, I find that the model implications are consistent with the data.

In the following section, I first explain the model and present its results. After discussing model-generated hypotheses, I empirically analyze whether the hypotheses are supported by the data and discuss the findings. I then conclude.

2 Model
2.1 Setup

Two players, the president (P) and the Senate (S), play a two-period appointment game. The policy space $X = [X_1, X_2]$ is a closed interval on the real line. Let $s \in X$ and $p \in X$ denote the president’s and the Senate’s ideal points, respectively. I assume the players’ policy utilities decrease as the absolute distance between the players’ ideal points and the policy outcome increases. Formally, each player’s instantaneous utility function is defined as

$$-|x - i|,$$
where \( x \in X \) is a policy and \( i \in \{ s, p \} \) is his or her ideal point.

At \( t = 1 \), a status quo \( q \in X \) is given and the president first decides whom to nominate. The nominee with ideal point \( x \in X \) is denoted by \( N_x \). Assume that there is a wide enough pool of potential nominees such that the president can choose any \( x \) that he wants.

Once the president makes a nomination, the Senate decides whether to delay its decision to the next period or not. If it decides not to delay, it confirms or rejects the nomination. If it delays its decision until \( t = 2 \), a utility transfer of \( B \) from the president to the Senate occurs if the Senate confirms the nomination. Assume that \( B \) is \( b(x) \) with probability \( \lambda \), where \( b(x) = \alpha (-|x - p| + |q - p|) \), \( \alpha \in (0, 1) \), and 0 with probability \( 1 - \lambda \). The value of \( B \) is realized and observed by all players at the beginning of the second period. After observing what \( B \) is, the Senate finally decides whether to confirm the nominee.

The random variable \( B \) captures the concession that the president may have to make in other policy areas to get his nominees confirmed. As mentioned before, the Senate has incentives to delay its decision to use the nomination as leverage in another bargaining issue. By dragging out the confirmation process, the Senate may benefit when bargaining with the president over legislative bills, the budget, executive branch acts, and other appointments (Shipan and Shannon 2003). The president would make concessions to the extent that the new appointment is still beneficial to him. If the president does not benefit much from the new appointment, holding the nomination hostage would not benefit the Senate much either. To reflect this, \( b(x) \) is assumed to be a portion of the president’s ideological gain from the new appointment. The term \(-|x - p| + |q - p|\) represents how much closer the new policy
outcome is to the president than the status quo. Thus, the Senate’s additional bargaining gain $b(x)$ varies depending on how beneficial the new appointment is to the president. The parameter $\alpha$ measures how important the nomination is to the president. When $\alpha$ is large, meaning that the nomination is very important, the president will be willing to concede a bigger portion of his ideological gain to get his nominees confirmed, and vice versa.

Once the nomination is confirmed, the policy outcome is realized at the nominee’s ideal point $x$. If the confirmation fails, the status quo $q$ is maintained. Players get their policy utility at each period and discount their future utilities with discount rate $\delta \in (0,1)$. The Senate pays some political costs $c$ for rejecting a presidential nominee. Defeating a presidential nominee is costly for the Senate, especially when the president is popular (Bond, Fleisher and Krutz 1998, 2009; Johnson and Roberts 2004).\footnote{The president may also pay some political costs for putting forth a nominee who cannot pass the Senate (Moraski and Shipan 1999). However, adding the cost term for the president does not change the qualitative results of the model. Thus, for simplicity, it is assumed that a failed nomination is not costly for the president.}
The sequence of the game is depicted in Figure 1.

2.2 Results

In this subsection, I present the results of the model. The solution concept is Subgame Perfect Equilibrium. Without loss of generality, I assume that the president is more conservative than the Senate, i.e.

$$s < p.$$
Figure 1: Sequence of the Confirmation Game
And the status quo is not at the president’s ideal point, i.e.,

\[ q \neq p. \]

This assumption rules out multiple equilibrium paths.\(^2\) Since \( q = p \) with Lebesgue measure 0, it does not affect the expected duration of confirmation that will be presented at the end of this section.

For simplicity, I assume the following tie-breaking rules for the president.\(^3\)

**Assumption 1** i) If the status quo \( q \) is one of the president’s best choices, he chooses to nominate \( N_q \).

ii) Consider two ideological positions \( x \) and \( x' \) such that the Senate confirms \( N_x \) without delay while it delays its decision if \( N_{x'} \) is chosen by the president. Then, the president nominates \( N_x \) if he is indifferent between choosing \( N_x \) and \( N_{x'} \).

iii) Consider two ideological positions \( x \) and \( x' \) such that the Senate delays and confirms \( N_x \) at \( t = 2 \) regardless of the value of \( B \) while it delays and confirms \( N_{x'} \) at \( t = 2 \) only if \( B > 0 \). The president nominates \( N_x \) if he is indifferent between choosing \( N_x \) and \( N_{x'} \).

The above assumptions is to decide the president’s action when he is indifferent between multiple choices. The first assumption is to deal with a situation in which the status quo is at the president’s ideal point. Since the status quo is at his most favorite position, the president may nominate someone with ideal point \( q \) or he nominates someone who will be

\(^2\)If this assumption is dropped, the Senate may accept \( N_x \) at \( t = 1 \) or 2 in Lemma A.15, which will lead to multiple equilibrium paths.

\(^3\)Removing these assumptions does not change the qualitative results of the model.
rejected by the Senate for sure. The president does not fear rejection at all because he still can get the policy utility from the status quo even if his nominee fails to gain confirmation. The first assumption says that in this case, the president nominates someone with ideal point $q$. The next assumption says that if the president is indifferent between two nominees, and the Senate will confirm one of them at $t = 1$ while it will confirm the other at $t = 2$ regardless of the value of $B$, the president chooses the one who can be confirmed without delay. Finally, the third assumption says that if the president is indifferent between two nominees, and the Senate will confirm one of them at $t = 2$ regardless of the value of $B$ while it will confirm the other one at $t = 2$ only if $B = b(x)$, the president chooses the former who can be confirmed for sure at $t = 2$.

As typical in finite sequential games, this game can be solved using backward induction. For a complete description of the equilibrium, the players’ contingency plan in every subgame should be specified. However, for practical purposes, it is sometimes safe to ignore subgames which are never reached in equilibrium. In this game, the president never chooses $x$ in some ranges and the Senate’s response for such $x$ does not have any important substantive meaning. Thus, in the rest of the paper, I will ignore some of these subgames which are never reached on the equilibrium path. Proposition 2.1 formally states the range of $x$ that the president might choose in equilibrium.

**Proposition 2.1** In equilibrium, the president’s choice of $x$ satisfies $b(x) \geq 0$ and $x \in [s, p]$.

Note that the above proposition says that $b(x) = \alpha (-|x - p| + |q - p|) \geq 0$, which
implies that the president can almost always improve his utility by appointments. Moreover, this means that the utility transfer $B$ is always non-negative in equilibrium. Thus, the Senate sometimes has an incentive to wait until the second period to obtain this additional gain. Even though the president may lose $b(x)$ additionally from Senate delay, the new appointment is always beneficial to him since he can still get a policy gain of 

$$(1 - \alpha) \left( - |x - p| + |q - p| \right) \geq 0.$$ 

I now start with the Senate’s equilibrium strategy. The Senate confirms the nomination without delay if the nominee’s ideal point is much closer to its own ideal point than the status quo. If it prefers the nominee’s ideological position much more to the status quo, it will not wait until the second period even if this might bring some bargaining gain $b(x)$. Since the decision to delay affects its policy utility at $t = 1$, it is too costly to delay confirmation if the nomination highly improves its policy utility. The Senate also confirms the nomination swiftly when the additional bargaining gain $b(x)$ is very small, even if the nominee’s ideal point $x$ is not much closer than the status quo to the Senate’s own ideal point. If the Senate knows that the president would not concede anything for the confirmation, there is no reason to delay. On the other hand, if the nominee’s ideal point $x$ is worse than the status quo, or confirming $x$ is better than rejecting it only because the rejection cost $c$ is too high, the Senate has an incentive to wait until the next period to get the additional bargaining benefit $b(x)$. In this case, the Senate intends to confirm the nomination in the end, but wants to postpone the decision since it might be able to use the nomination as leverage in another bargaining issue. Next, interestingly, there is a case in which the Senate
strictly prefers rejecting the nomination to confirming it at \( t = 1 \), but is not certain about its future preference. This happens when it prefers maintaining the status quo if \( B = 0 \), but prefers confirming \( x \) if \( B = b(x) > 0 \). At \( t = 1 \), the Senate does not know whether there will be an additional bargaining opportunity or not in the next period. Since it is not sure about its future preference, it has an incentive to wait until the next period instead of deciding immediately whether to confirm. This is what Kreps (1979) labels as a *preference for flexibility*. The Senate wants to keep the right to choose until the next period because of the uncertainty on \( B \). Finally, if the nominee’s ideal point is much farther from the Senate’s ideal point \( s \) than the status quo, the Senate delays and rejects the nominee at \( t = 2 \). As it pays the rejection cost \( c \) at the time of rejection, as long as \( \delta < 1 \), delaying is better although its decision was made in the beginning. This may explain why empirically there are no quick rejections. Proposition 2.2 summarizes the Senate’s equilibrium strategy. As mentioned before, the Senate’s strategy is described only for \( x \) such that \( s < x < p \) and \( b(x) \geq 0 \). The following will be used for the rest of the paper:

\[
D_1 = \frac{1}{1 + \delta \lambda \alpha} (s + |q - s| - \delta \lambda \alpha (-p + |q - p|)), \\
D_2 = s + |q - s| + c, \quad \text{and} \\
D_3 = \frac{1}{1 - \alpha} (s + |q - s| + c + \alpha (-p + |q - p|)).
\]

Lemma A.9 in the appendix shows \( D_1 < D_2 < D_3 \).
Proposition 2.2 On any equilibrium paths where the president nominates $N_x$, the Senate

- confirms $N_x$ at $t = 1$ if $x \leq D_1$
- confirms $N_x$ at $t = 2$ if $D_1 < x \leq D_2,$
- confirms $N_x$ at $t = 2$ when $B = b(x)$ and rejects $N_x$ when $B = 0$ if $D_2 < x \leq D_3,$
- rejects $N_x$ at $t = 2$ if $D_3 < x.$

Given the Senate’s strategy, the president chooses the nominee’s ideological position, $x$, optimally. The president’s equilibrium strategy is quite complicated because, given $q$, the president’s expected utility is not continuous in $x$. This happens because, as $x$ moves, the Senate suddenly switches from not delaying to delaying, and from confirming for sure to confirming if $B = b(x)$. Figure 2 illustrates that the president’s expected utility is not continuous around $x = 0.54$ and $x = 1.07$ when $q = 0.2$, $s = 0$, $p = 1$, $\lambda = 0.7$, $\alpha = 0.6$, $\delta = 0.9$, and $c = 0.35$. In this case, the best choice for the president is $x = p = 1$.

One thing to note in this example is that, unlike in standard agenda-control models of appointments (e.g., Moraski and Shishan 1999; Nokken and Sala 2000; Primo, Binder and Maltzman 2008), the president tries to set $x$ at his ideal point, even though the status quo lies between the ideal points of the president and the Senate. The reason is that there is a chance that the Senate will confirm the nominee whose ideal point is the same as that of the president. To see that the Senate may confirm the nominee, compute the Senate’s utilities. Its stage utility from confirming the nominee is $-|x - s| = -1$, while the stage utility from rejecting the nominee is $-|q - s| - c = -0.55$ with the rejection cost and $-0.2$ without the rejection cost.

At first glance, it seems that the Senate should reject the nominee because the expected
additional benefit of confirming the nomination at $t = 2$ is just $\lambda b(x) = \alpha (-|x - p| + |q - p|) = 0.336$. However, what is important is not the expected benefit, but the fact that the Senate has the flexibility to delay the decision.$^4$ That is, if it waits until the next period, the payoff from confirming is $u_S(\text{confirm } x \text{ at } t = 2|B = b(x)) = -|q - s| - \delta |x - s| + b(x) = -0.62$ with probability $\lambda$, while the payoff from rejecting is $u_S(\text{reject } x \text{ at } t = 2) = -|q - s| \cdot (1 + \delta) - \delta c = -0.695$. Thus, the Senate can make a decision depending on the realized value of $B$. If it keeps this decision by delaying, the utility is $-0.62\lambda - 0.695 (1 - \lambda) = -0.6425$.

The Senate’s utility from confirming or rejecting at $t = 1$ can be easily calculated below $-0.87$. If it makes a decision at $t = 1$, it gets either $u_S(\text{confirm } x \text{ at } t = 1) = -|x - s| \cdot$.

$^4$Mathematically, an expectation of a maximum is (weakly) greater than a maximum of expectations.
\[(1 + \delta) = -1.9 \text{ or } u_S (\text{reject } x \text{ at } t = 1) = -|q - s| \cdot (1 + \delta) - c = -0.73. \] Therefore, it would delay until the next period. Knowing this, the president can choose his best position \( x = p \).

The president’s equilibrium strategy divides \( X \) into several intervals and the president’s best choice depends on which interval \( q \) belongs to. The president’s best choice is continuous in \( q \) in each interval, but not between adjacent intervals. Moreover, the number of the intervals varies depending on parameter values. Proposition 2.3 describes the president’s strategy.

**Proposition 2.3** Assume \( X \) is sufficiently large. Then the president’s equilibrium strategy is as follows:

i) For sufficiently small \( q \), the president chooses a nominee with ideal point \( x = p \).

ii) As \( q \) increases up to \( s \), the president switches to \( D_1, p, D_2, p \) and \( D_3 \) in order. Depending on other parameter values, \( p \)’s, \( D_2 \) and/or \( D_3 \) may not be played.

iii) As \( q \) increases from \( s \), the president switches to \( D_3, p, D_2, p \) in order. Depending on other parameter values, \( D_3 \) and the first \( p \) may not be played.

It is worth mentioning that the president’s best choice of \( x \) as a function of \( q \) is not symmetric around \( s \). Figure 3 illustrates the president’s equilibrium strategy for each \( q \) under the same parameter settings as in the previous example. The figure clearly shows the asymmetry. In particular, note that when the status quo is on the left side of the Senate’s ideal point, but not extremely far away from it, it is hard for the president to draw the status quo near his ideal point. For instance, in the figure, look at the president’s choices \( x_1 \) and \( x_2 \)
Figure 3: President’s Equilibrium Strategy (Note: Assumes $s = 0$, $p = 1$, $\lambda = 0.7$, $\alpha = 0.6$, $\delta = 0.9$, and $c = 0.35$.)

for $q = q_1 = 0.7$ and $q = q_2 = -0.7$, respectively. The president chooses $x_1 = 1$ for $q_1$ while he chooses $x_2 = 0.316$ for $q_2$. This contrasts starkly with one-shot games of appointments, which all predict that the president’s choice of nominee’s ideal point is the same for $q_1$ and $q_2$, since the ideological distances to the Senate are the same.

Then, why does the president choose a worse ideological position for $q_2$ even though the Senate is indifferent between $q_1$ and $q_2$? When the status quo is at $q_1$, the president chooses $x_1$ and the Senate delays and accepts it at $t = 2$. On the other hand, when the status quo is at $q_2$, the president chooses $x_2$ and the Senate immediately accepts it. If the president tries to move from $q_2$ to $x_1$, the Senate delays and accepts $x_1$ at $t = 2$. However, the president is much more concerned about delay when the status quo is at $q_2$ than it is at $q_1$ because $q_2$

\footnote{Check Proposition 2.2 to confirm the Senate’s decision.}
is far away from the president’s ideal point. If the Senate delays its decision, the president has to get his policy utility from the status quo for the first period. Even though he knows that a conservative nominee with ideal point \( x = 1 \) will be eventually confirmed regardless of whether \( q = q_1 \) or \( q = q_2 \), the ideological cost of delay—the utility loss that the president incurs from delay due to the distance between his ideal point and the status quo—is too high to bear when the status quo is at \( q_2 \). Therefore, when the status quo is at \( q_2 \), the president will not try to nominate someone with a very conservative ideal point given the fear of delay or rejection. Instead, he chooses \( x \) in the area where the Senate confirms it without delay.

This shows the importance of the dynamic nature of political appointment games between the president and the Senate. Both the Senate’s utilities and those of the president are affected not only by the Senate’s final decision on the nomination, but also its decision of whether to delay or not. Thus, when making a nomination, the president has to worry about the ideological cost of delay he is facing as well as whether the Senate would confirm it. As a result, the president appoints someone with a moderate ideal point to avoid delay. Although McCarty and Razaghian (1999) also point out that the president sometimes chooses moderate nominees wishing quicker confirmation, they do not specify under what conditions the president is willing to make such trade-offs. Here, the cost of delay is not constant, as it varies depending on the position of the status quo. Thus, the president wants to avoid delay when the status quo is to the left of the Senate and far enough from the Senate’s ideal point. More precise conditions are provided in Proposition 2.4 below.

While existing studies emphasize that delay is more likely when the status quo lies be-
between the ideal points of the president and the Senate, it is not clear why the case is so
different from the other cases in which the status quo is to the right of the president’s ideal
point or to the left of the Senate’s ideal point. For example, based on the model by Moraski
and Shipan (1999), Shipan and Shannon (2003) argue that the Senate is more likely to delay
when the status quo is between the two players’ ideal points because it is at best indifferent
between the nominee’s ideal point and the status quo. That is, given the limited amount of
time, it does not have strong incentive to confirm the nomination quickly because there will
be no policy gain. However, in their framework, the same thing is true when the status quo
is between $s$ and $2s - p$, the mirror point of the president’s ideal point around the Senate’s
ideal point. Thus, their argument is not consistent with their model. On the other hand,
my model shows that because of the ideological cost of delay, delay is less likely to occur
when the status quo is to the left side, rather than the right side, of the Senate’s ideal point.
Thus, my model supports their argument with a better explanation.

The next proposition characterizes the area of the status quo in which delay occurs. I
will call it the delay area.

**Proposition 2.4** Along the equilibrium path, there exists unique $\kappa \in \mathbb{R}$ such that, for any
$X$, the Senate delays its decision until $t = 2$ if and only if $\kappa < q < p$. Moreover,

i) $\kappa < s$ , and

ii) $\kappa$ is strictly increasing in $s$, and weakly decreasing in $p$ and $c$.

Proposition 2.4 states that the delay area is $(\kappa, p)$. Given the complexity of the president’s
equilibrium strategy, it is surprising that the delay area is one interval. The delay area has several interesting properties.\(^6\)

First of all, under all parameter settings, the delay area is wider than the interval between the ideal points of the president and the Senate. One would naturally expect that delay is likely when the status quo is between the president’s and the Senate’s ideal points because any movement from the status quo will make either player worse off. On the other hand, it might not be clear why delay occurs when the status quo is to the left of the Senate’s ideal point. To understand the reason, recall that the president’s best choice of \( x \) lies between the president’s and the Senate’s ideal points, i.e., \( s < x < p \). The president’s policy gain from the new appointment is \(-|x - p| + |q - p| = x - q\), while the Senate’s gain is \(-|x - s| + |q - s| = -q + x\). Therefore, the new appointment is more beneficial to the president than to the Senate by \( 2x > 0 \). This means that, even if for the Senate there is little policy gain (if any) from the new appointment, the additional bargaining gain \( b(x) \) could be quite large because it is a portion of the president’s policy gain. Thus, the Senate has a strong incentive to wait until the next period.

Next, as the ideological distance between the president and the Senate increases, the delay area becomes wider. Why does the ideological gap matter? Whenever the status quo lies between the ideal points of the president and the Senate, if the president attempts to move the status quo closer to his ideal point, no matter how slightly, the Senate will delay its

\(^6\) The uniqueness of \( \kappa \) may not hold if we fix \( X = [X_1, X_2] \). For example, if \( \kappa < X_1 \), any \((\kappa', p)\) with \( \kappa' \leq X_1 \) can be called a delay area.
decision because it prefers the status quo. As mentioned above, since the status quo is close enough to the president’s ideal point to make the president bear the ideological cost of delay in this case, the president will appoint someone whose ideal point is closer to his own ideal point than the status quo. This result is consistent with the existing empirical findings in the literature (Asmussen 2010; Binder and Maltzman 2002; McCarty and Razaghian 1999; Shipan and Shannon 2003; Williams 2008).

This implies that a rational president chooses policy gain over quicker confirmation when the status quo is not too far from his ideal point. Therefore, it provides a theoretical micro foundation for existing claims and findings in the literature. For example, Binder and Maltzman (2002) argue that the greater the ideological difference between the Senate and the president, the longer it takes for the Senate to confirm the nomination because the Senate prefers slower movement on ideological foes. This argument implicitly assumes that the president always appoints someone who shares his ideological view regardless of the ideological position of his opponent or the status quo, even when this would cause an excessive delay. However, the president may take into account the Senate’s preference and make a decision to minimize the cost of delay. My analysis verifies that even if the president behaves rationally, delay is more likely to occur as the ideological disagreement between the president and the Senate becomes deeper.

Finally, the delay area becomes wider when the Senate’s rejection cost $c$ increases. When the Senate’s rejection cost $c$ increases, the president’s advantage over the Senate increases. If he tries to nominate someone quite extreme, the Senate will not be able to reject the
nomination due to the high rejection cost. At best, it delays and confirms the appointee later. The president does not fear the ideological cost of delay even when the status quo is quite far from his ideal point since his policy utility can be greatly improved in the second period. Thus, the delay area expands.

With the delay area characterized above, I now derive testable implications of the model. In particular, it is natural to analyze the impacts of model parameters on the expected duration.

To see the impact of the ideological distance between the president and the Senate on the expected duration, I assume that the status quo, $q$, the president’s ideal point, $p$, and the Senate’s ideal point, $s$, are independent random variables that are uniform on the policy space $X$. \footnote{Here, I drop the assumption $s < p$. It will be clear that this assumption is irrelevant to the following proposition.} Then define the expected duration conditional on the ideological distance between the president and the Senate:

$$D(z; c) = \Pr \{ \text{delay} | |p - s| = z \},$$

where $z \geq 0$ is the ideological distance between the president and the Senate. Although it is not explicitly indicated, $D(z; c)$ depends on other parameters.

**Proposition 2.5** The expected duration is weakly increasing in $z$ and $c$. Moreover, the effect of $z$ decreases as $c$ increases. That is, $D(z; c)$ is twice differentiable and

$$\frac{\partial}{\partial z} D(z; c) \geq 0, \quad \frac{\partial}{\partial c} D(z; c) \geq 0 \quad \text{and} \quad \frac{\partial^2}{\partial c \partial z} D(z; c) \leq 0.$$
The first implication is that as the ideological distance between the president and the Senate increases, the Senate is more likely to delay its decision. Second, as the Senate’s rejection cost increases, the Senate is more likely to delay its decision. Finally, and most interestingly, the effect of the ideological distance between the president and the Senate depends on the Senate’s rejection cost. Specifically, when the rejection cost is high, the ideological disagreement between the players does not have much effect on the delay decision whereas it has a greater effect when the rejection cost is low.

In addition to the implications on confirmation duration, the model produces implications on confirmation success. The next proposition shows the impact of $z, c$ and $\alpha$ on confirmation success.

**Proposition 2.6** The probability of confirmation success (either at $t = 1$ or $t = 2$) is decreasing in $z$, and increasing in $c$.

In equilibrium, the president never nominates someone who will be rejected by the Senate for sure.\(^8\) Rejection may occur when the president chooses a somewhat extreme $x$ while expecting to buy off the Senate in other policy areas. Formally, this corresponds with the case in which the president chooses $x$ such that $D_2 < x \leq D_3$. Since the opportunity to buy off the Senate arises with probability $\lambda$, the nominee is rejected with probability $1 - \lambda$. The range of status quo over which such choice of $x$ is optimal expands with $z$, and shrinks with $c$. Thus, the probability of confirmation success is decreasing in $z$, and increasing in $c$. When

---

\(^8\)See Lemma A.18 in the appendix for a formal proof.
the Senate is ideologically distant, the president will have to choose \( x \) in \([D_2, D_3] \) because he will have difficulty getting his chosen nominees confirmed without paying additional costs to the Senate. On the other hand, if the Senate’s rejection cost \( c \) becomes higher, the president can move the status quo much closer to him without gambling. That is, the safer option gets more attractive in this case. Thus, to maximize his policy gain, the president would rather choose a more moderate nominee who can be confirmed without side payment.

3 Empirical Test

3.1 Hypotheses

From the analysis in the previous section, I get five empirically testable hypotheses. While measuring \( z \), the ideological distance between the president and the Senate, is straightforward, it is less obvious how to measure the Senate’s rejection cost \( c \). I assume that the Senate’s rejection cost \( c \) is higher when the president is more popular. This assumption is consistent with existing studies (Bond, Fleisher and Krutz 1998, 2009; Johnson and Roberts 2004) which show that popular presidents can influence senators’ decisions via mobilization of their constituents. Rejection is more costly if the president is popular.

Proposition 2.4 can be translated to the following three hypotheses.

- Hypothesis 1: Ideological distance between the president and the Senate has a positive effect on confirmation duration.

- Hypothesis 2: The more popular the president is, the longer it takes for the Senate to
confirm the nominee.

- Hypothesis 3: The effect of ideological distance between the president and the Senate is stronger when the president is less popular.

The first hypothesis is already tested and confirmed by many other studies. The second may seem counterintuitive. One might think that the Senate should confirm the nomination swiftly if the president is very popular. However, the model shows that if it becomes harder for the Senate to reject a presidential nominee, the president maximizes his policy gain even when the ideological cost of delay is quite big. Thus, popular presidents nominate people with more extreme ideal points when compared to less popular presidents, which results in more delays. Since the possibility of delay might be already maximized when the president is highly popular, the effect of the ideological disagreement between the president and the Senate may not be great. The third hypothesis says that the effect of the ideological distance between the president and the Senate decreases when the president is more popular.

Proposition 2.4 produces the following three hypotheses on confirmation success.

- Hypothesis 4: The Senate is more likely to confirm nominees the closer its ideological position is to that of the president.

- Hypothesis 5: The Senate is more likely to confirm nominees the more popular the president is.

It is worth mentioning that while the president’s popularity has a negative effect on
confirmation duration, it has a positive effect on confirmation success. I will not test these two hypotheses in this paper, however, since these are already dealt with in the literature. For Hypothesis 4, see Asmussen (2010) and Williams (2008). And for Hypothesis 5, see Krutz, Fleisher and Bond (1998) (see also Brace and Hinckley 1992; Edwards 1980; Ostrom and Simon 1985; Rivers and Rose 1985). All of these papers support the corresponding hypotheses.

3.2 Data and Method

To see whether the model predictions are consistent with data, I use data on appellate court nominations from 1977-2004 from the Lower Court Confirmation Database. The dependent variable is Duration, which is the number of days between the nomination by the president and final action by the Senate, excluding recesses. I treat as censored data those nominations that are withdrawn by the president or those that are unacted on by the end of the congressional session.

One of the key independent variable is the Ideological Distance between the President and the Senate. To measure this, I collected the first-dimension DW-NOMINATE scores and constructed four different measures of ideological distance. First, since the Senate decides whether to delay in the model, the ideological position of the relevant filibuster pivot might be a good representation of the Senate’s ideological position as in a pure preference model (Krehbiel 1998). Thus, I first use the absolute difference between the scores of the president and the relevant filibuster pivot. This measure could be misleading, however, since there
are various delay tactics that can be used by the minority in the Senate. For example, the Senate’s rules empower the minority to force up to 30 hours of floor time for each nominee. Also, the political parties may affect their members’ voting behavior. Thus, alternatively, the distance between the president and the chamber median is measured. Also, the distance between the president and the opposition party’s median is calculated. Finally, there are criticisms that the president’s DW-NOMINATE score is more extreme than one would expect (Treier 2010). Thus, instead of the president’s score, I use the score of the median of his party and calculate its distance from the opposition party’s median.

The next important variable is the president’s popularity at the time of each nomination. For this measure, I use Approval, which is the president’s job approval rating divided by 100 based on the Gallup poll closest to the date of each nomination. To test Hypothesis 3, an interaction term Ideological Distance \times Approval is included.

Following the existing literature, I also include other important control variables:

Presidential Election Year is a dummy variable which is coded 1 if the nomination is made in the last year of a presidential term, and 0 otherwise.

Renom is a dummy variable which takes a value of 1 if the nominee is nominated repeatedly for the same seat, 0 otherwise.

Minority is a dummy variable which takes a value of 1 if the nominee is a minority (African-American, Hispanic or Asian).

Well-Qualified is a dummy variable which takes a value of 1 if the nominee’s American Bar Association (ABA) rating is more than ‘well qualified/qualified,’ and 0 otherwise.
\# Pending Nominations is the number of district and circuit court nominations being considered by the Senate at the time of the nomination.

Senatorial Courtesy is a dummy variable which takes a value of 1 if at least one of the nominee’s home state Senators is of the same party as the president, and 0 otherwise.

Previously District Judge is a dummy variable which takes a value of 1 if the nominee previously served on the federal district courts, and 0 otherwise.

Interest Group Opposition is a dummy variable which is equal to 1 if at least two national interest groups publicly oppose a nomination.

Balanced is a dummy variable which takes a value of 1 if the percent of judges in the circuit appointed by Democratic presidents is between 40 and 60 percent.

Days left is equal to the number of days left in the session divided by 100 at the time the nomination is made.

Additionally, to control for any temporal trends in the data, I include fixed effects for each Congress.\(^9\) Given the nature of the dependent variable, I use a Cox proportional hazard model to test the hypotheses. Since there are repeatedly nominated individuals, I calculate robust standard errors, clustering on each nominee to control for correlated errors across multiple observations for a single nominee.

\(^9\)Each president is therefore automatically controlled.
3.3 Result

The regression results are presented in Table 1. In the Cox model, the hazard is assumed to be

\[ h(t) = h_0(t) \cdot J, \]

where \( J = \exp(\beta_1 x_1 + ... + \beta_k x_k) \) and \( k \) is the number of regressors. A negative coefficient implies a lower hazard, and thus a longer duration, while a positive coefficient implies a higher hazard, and thus a shorter duration. For example, Table 1 shows that nominees should wait significantly longer to be confirmed if interest groups oppose their nominations. On the contrary, well-qualified nominees are significantly more quickly confirmed than the unqualified. However, the effects of key independent variables such as Ideological Distance and Approval are hard to interpret directly because of the interaction term.

I call \( J \) the non-baseline hazard. To see how the key independent variables affect duration, it is more useful to investigate \( J \) than the hazard, \( h(t) \), since time is not the variable of interest here. Figure 4 shows the relationship between the non-baseline hazard and Ideological Distance for low, middle, and high approval rates for model 1, holding other explanatory variables at their means. The remaining models also produce similar graphs. From the figure, it is clear that Hypotheses 1, 2, and 3 are supported by the data. First, as in Hypothesis 1, when the ideological distance between the president and the Senate increases, the hazard decreases, and thus, confirmation duration is longer. Second, per Hypothesis 2, for a given ideological distance between the president and the Senate, the hazard is always higher when
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<tr>
<td>Ideological Distance between</td>
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</tr>
<tr>
<td>President-filibuster pivot</td>
<td>−11.94**</td>
<td></td>
<td></td>
<td>−31.68**</td>
</tr>
<tr>
<td></td>
<td>(3.67)</td>
<td></td>
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<td>(7.65)</td>
</tr>
<tr>
<td>President-chamber median</td>
<td></td>
<td>−16.6**</td>
<td></td>
<td>−20.27**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.38)</td>
<td></td>
<td>(6.5)</td>
</tr>
<tr>
<td>President-opposing party median</td>
<td></td>
<td></td>
<td>−20.27**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(6.5)</td>
<td></td>
</tr>
<tr>
<td>Party medians</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval</td>
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<td>−10.13**</td>
<td>−19.42*</td>
<td>−26.48**</td>
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<td></td>
<td>(4.47)</td>
<td>(3.79)</td>
<td>(10.1)</td>
<td>(9.45)</td>
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<td>Ideological Distance × Approval</td>
<td>13.49*</td>
<td>14.97**</td>
<td>21.2*</td>
<td>36.91**</td>
</tr>
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<td>(12.7)</td>
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<td>Presidential Election Year</td>
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<td>(0.33)</td>
<td>(0.33)</td>
<td>(0.31)</td>
<td>(0.31)</td>
</tr>
<tr>
<td>Renom</td>
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<td>−0.15</td>
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<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.27)</td>
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<td>−0.12</td>
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<td>(0.21)</td>
<td>(0.21)</td>
<td>(0.21)</td>
<td>(0.2)</td>
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<td>Well-Qualified</td>
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<td>0.41**</td>
<td>0.43**</td>
<td>0.45**</td>
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<tr>
<td></td>
<td>(0.15)</td>
<td>(0.15)</td>
<td>(0.15)</td>
<td>(0.15)</td>
</tr>
<tr>
<td># Pending Nominations</td>
<td>−0.013</td>
<td>−0.011</td>
<td>−0.014</td>
<td>−0.015</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Senatorial Courtesy</td>
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<td>0.14</td>
<td>0.16</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Previously District Judge</td>
<td>0.059</td>
<td>0.059</td>
<td>0.057</td>
<td>0.051</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.14)</td>
<td>(0.14)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>Interest Group Opposition</td>
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<td>−1.46**</td>
<td>−1.46**</td>
<td>−1.48**</td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td>(0.23)</td>
<td>(0.24)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>Balanced</td>
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<td>−0.2</td>
<td>−0.2</td>
<td>−0.18</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>Days left</td>
<td>0.011</td>
<td>0.017</td>
<td>−0.0066</td>
<td>−0.009</td>
</tr>
<tr>
<td></td>
<td>(0.078)</td>
<td>(0.079)</td>
<td>(0.076)</td>
<td>(0.076)</td>
</tr>
<tr>
<td>Log Pseudo-likelihood</td>
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<td>−1244.45</td>
<td>−1245.37</td>
<td>−1243.83</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>383</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 1: Cox Regression of the Timing of Senate Confirmation Decisions, 1977-2004 (Note: Robust standard errors in parentheses **p<.05 and *p<.1 (two-tailed test); Dummy variables for each Congress are included in the model, but not reported above.)
approval rate is higher. Thus, the Senate is more likely to delay the confirmation when the president is more popular. Finally, the effect of the ideological distance on the hazard is much stronger when the approval rate is lower, as predicted by Hypothesis 3. In the figure, the slope is much steeper when the approval rate is 0.4 and it is almost flat when the approval rate is 0.8.

Table 2 shows the magnitude of key independent variables’ effects on the duration of confirmation. For example, when ideological distance changes by 0.15, and the presidential approval rate is 0.4, a nominee’s hazard rate is estimated to decrease by 62.5% in Model 1. This table clearly shows that in all of the four models, if the ideological distance between the president and the Senate increases, the duration lengthens, as per Hypothesis 1. Also, such effect decreases as the presidential approval rate increases. For instance, in Model 4,
the hazard rate decreases by 92.1% when the approval rate is low and by only 27.6% when the approval rate is high. Also, when the approval rate increases by 0.15 and the ideological distance is 0.6, a nominee’s hazard rate is estimated to decrease as predicted in Hypothesis 2. Thus, when the president is popular, the confirmation duration becomes longer.

4 Conclusion

In this paper, I provide an institutional explanation for senatorial delays in the judicial confirmation process. By developing a dynamic model, I identify the conditions under which the president makes a nomination that the Senate has an incentive to wait to confirm. Delays do not occur simply because the Senate does not want to support the president’s nominee of choice. Rather, it occurs when the president is able to bear the ideological cost of delay and try to maximize his policy gain despite the cost. The empirical analysis supports the implications of the model.

The model can be extended in various directions. Solving the model for $n$ periods instead
of two is the most straightforward extension. The $n$-period model is expected to produce similar implications. Also, one can allow the president to nominate another candidate whenever the Senate rejects his nominee. It will be an infinite horizon game and may add more insight to the current model.

Empirically, the model can be applied to other non-judicial presidential appointments. It will be also an interesting investigation to see whether the model’s implications are supported by data on executive branch appointments, appointments to independent boards, or the Supreme Court.

\section{Appendix}

Let $\{a, r, aa, ar, ra, rr\}$ be the set of actions available to the Senate at each subgame $x$ where the president chooses $x$. Specifically, $a$ and $r$ are “accept (or confirm)” and “reject” at $t = 1$, and $ar$, for example, denotes “delay and accept if $B = b(x)$, and reject at $t = 2$ if $B = 0$.” Other actions, $aa, ra$ and $rr$, are defined similarly. Let $d = \{aa, ar, ra, rr\}$ be the action to delay the decision. I may say the Senate plays $a (r, ...)$ for $x$, instead of saying the Senate accepts $x$ at $t = 1$ (rejects $x$ at $t = 1$, ...) when the president chooses $x$. Also, I will omit “in every equilibrium” whenever it is clearly an equilibrium strategy.

The Senate’s lifetime utilities for each action for a nominee with his ideal point at $x$ are:

\begin{align*}
    u_S (a, x) &= -|x - s| (1 + \delta), \\
    u_S (r, x) &= -|q - s| (1 + \delta) - c, \\
    u_S (aa, x) &= -|q - s| - \delta |x - s| + \delta \lambda b(x), \\
    u_S (ar, x) &= -|q - s| + \delta \lambda (-|x - s| + b(x)) + \delta (1 - \lambda) (-|q - s| - c) \\
    u_S (ra, x) &= -|q - s| + \delta \lambda (-|q - s| - c) + \delta (1 - \lambda) (-|x - s|) \text{ and} \\
    u_S (rr, x) &= -|q - s| + \delta (-|q - s| - c),
\end{align*}

where $b(x) = \alpha (-|x - p| + |q - p|)$. Then, the expected utility when the Senate delays its
decision until \( t = 2 \) is
\[
u_S(d, x) = - |q - s| + \delta E \left[ \max \left\{ - |x - s| + B, - |q - s| - c \right\} \right],
\]
where \( B = b(x) \) with prob. \( \lambda \), and \( B = 0 \) with prob \( 1 - \lambda \).

When the president chooses \( x \), the president’s lifetime utilities given the Senate’s actions at \( x \) are:

\[
\begin{align*}
u_P(x; a) &= - |x - p| (1 + \delta), \\
u_P(x; r) &= - |q - p| (1 + \delta), \\
u_P(x; aa) &= - |q - p| - \delta |x - p| - \lambda \delta \alpha (- |x - p| + |q - p|) \\
&= - (1 + \lambda \delta \alpha) |q - p| - \delta (1 - \lambda \alpha) |x - p|, \\
u_P(x; ar) &= - |q - p| - \delta \lambda |x - p| - \delta (1 - \lambda) |q - p| - \lambda \delta \alpha (- |x - p| + |q - p|) \\
&= - (1 + \delta (1 - \lambda + \lambda \alpha)) |q - p| - \delta \lambda (1 - \alpha) |x - p|, \\
u_P(x; ra) &= - |q - p| - \delta \lambda |q - p| - \delta (1 - \lambda) |x - p| \\
&= - (1 + \delta \lambda) |q - p| - \delta (1 - \lambda) |x - p|, \text{ and} \\
u_P(x; rr) &= - |q - p| (1 + \delta). 
\end{align*}
\]

Like in the main text, \( s < p \) is assumed throughout the proof, unless stated otherwise.

By the following lemma, I will not consider \( r \) as available to the Senate, without referring to it.

**Lemma A.1** \( u_S(r, x) < u_S(d, x) \). Consequently, the Senate never plays \( r \).

**Proof.** Compute
\[
\begin{align*}
u_S(r, x) - u_S(d, x) &= - |q - s| (1 + \delta) + |q - s| - \delta E \left[ \max \left\{ - |x - s| + B, - |q - s| - c \right\} \right] \\
&= - (1 - \delta) c + \delta (- |q - s| - c - E \left[ \max \left\{ - |x - s| + B, - |q - s| - c \right\} \right]) \\
&\leq - (1 - \delta) c < 0.
\end{align*}
\]

**Proof of Proposition 2.1.**

The following two lemmas show that \( b(x) \geq 0 \). It will be used without referring to the lemma.
Lemma A.2 The Senate plays \( a \) or \( aa \) for \( x = q \).

**Proof.** Consider the subgame at \( t = 2 \) where the nominee’s ideal point is \( q \) and \( B = b(q) \). Note that \( b(q) = 0 \). At this subgame, the Senate’s stage utility is \(-|q - s|\) if it accepts, and \(-|q - s| - c\) if it rejects. Thus, the Senate prefers to accept it at this subgame. The other subgame with \( B = 0 \) has exactly the same payoffs to the Senate, and it prefers to accept at this subgame as well. Therefore, the Senate will accept the nominee for sure, at \( t = 2 \).

Now consider the Senate’s decision at \( t = 1 \). Compute that
\[
    u_P(q; a) = u_P(aa; q) = -|q - s|(1 + \delta) > -|q - s|(1 + \delta) - c = u_S(r; q).
\]
Therefore, the Senate plays \( a \) or \( aa \) for \( x = q \).

Lemma A.3 \( b(x) \geq 0 \) on any equilibrium paths. Consequently, \( B \geq 0 \).

**Proof.** Suppose \( b(x) < 0 \) by contradiction. I will show that the president will choose \( q \) over \( x \). By Lemma A.2, the Senate plays \( a \) or \( aa \) for \( q \). Then, since \( b(x) < 0 \), one can see that
\[
    u_P(q; a) = u_P(q; aa) > \max\{u_P(x; a), u_P(x; aa), u_P(x; ar), u_P(x; ra)\}.
\]
The president has an incentive to deviate to \( q \), when the Senate plays \( a, aa, ar \) or \( ra \) for \( x \). For the other actions of the Senate, observe that
\[
    u_P(q; a) = u_P(q; aa) = u_P(x; r) = u_P(x; rr).
\]
By Assumption 1, the president does not choose \( x \).

To show \( x \in [s, p] \), I prove the following lemmas first.

**Lemma A.4** If \(-|x' - s| > -|q - s| - c\), the Senate plays \( a \) or \( aa \) for \( x' \).

**Proof.** Suppose \( x' \) is chosen. Then, at \( t = 2 \),
\[
    -|x' - s| + B > -|q - s| - c
\]
since \( B \geq 0 \). Thus, the Senate should accept \( x' \) at the \( t = 2 \) subgames for \( B = 0 \) and \( B = b(x') \). Thus, the Senate strictly prefers \( aa \) to \( ar, ra \) and \( rr \). Since \( r \) is never played, the Senate plays \( a \) or \( aa \) for \( x' \).
Lemma A.5 Suppose that the Senate plays $a$ at $x$. If $x < x' = s$ or $p = x' < x$, the president prefers $x'$ to $x$ strictly.

**Proof.** Step 1. $u_S(a, x') > u_S(r, x')$: From $u_S(a, x) \geq u_S(r, x)$,

\[
u_S(a, x') = -|x' - s|(1 + \delta) > -|x - s|(1 + \delta) = u_S(a, x)
\]

\[
\geq u_S(r, x) = u_S(r, x').
\]

Step 2. $-|x - s| \geq -|q - s| - c$: Suppose not. Then, $u_S(a, x) \geq u_S(d, x)$ implies

\[
-|x - s|(1 + \delta) \geq -|q - s| + \delta E \max \{-|x - s| + B, -|q - s| - c\}
\]

\[
= -|q - s|(1 + \delta) - \delta c
\]

\[
> -|q - s|(1 + \delta) - (1 + \delta)c
\]

\[
> -|x - s|(1 + \delta),
\]

which is a contradiction.

Step 3. $u_S(a, x') > u_S(d, x')$: Note that

\[
u_S(d, x) = -|q - s| + \delta E \max \{-|x - s| + B, -|q - s| - c\}
\]

\[
= -|q - s| - \delta|x - s| + \delta \lambda b(x).
\]

Therefore, rearranging $u_S(a, x) \geq u_S(d, x)$ using $b(x) = \alpha \left(-|x - p| + |q - p|\right)$ gives

\[-|x - s| - \delta \lambda \alpha (-|x - p| + |q - p|) + |q - s| \geq 0.
\]

Then, compute

\[
u_S(a, x') - u_S(d, x')
\]

\[
= -|x' - s|(1 + \delta) + |q - s| - \delta E \max \{-|x' - s| + B, -|q - s| - c\}
\]

\[
= -|x' - s|(1 + \delta) + |q - s| + \delta|x' - s| - \delta \lambda b(x')
\]

\[
= -|x' - s| - \delta \lambda b(x') + |q - s|
\]

\[
= -|x' - s| - \delta \lambda \alpha (-|x' - p| + |q - p|) + |q - s|
\]

\[
> -|x - s| - \delta \lambda \alpha (-|x - p| + |q - p|) + |q - s| \geq 0.
\]

The second equality follows because $-|x' - s| \geq -|x - s| \geq -|q - s| - c$, and the second last inequality holds because $x < x' = s$ or $p = x' < x$. 

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Step 4. the president prefers \( x' \) to \( x \) strictly: By Steps 1 and 3, the Senate plays \( a \) at \( x' \). Thus,

\[
 u_P (x'; a) = -|x' - p| (1 + \delta) \\
> -|x - p| (1 + \delta) = u_P (x; a).
\]

\[\blacksquare\]

**Lemma A.6** Suppose that the Senate plays \( aa \) at \( x \). If \( x < x' = s \) or \( p = x' < x \), the president prefers \( x' \) to \( x \) strictly.

**Proof.** Consider the subgame where \( x \) is chosen and \( B = b(x) \). Since the Senate accepts \( x \) at this subgame,

\[-|x - s| + b(x) \geq -|q - s| - c.\]

Then,

\[-|x' - s| + b(x') > -|x - s| + b(x) \geq -|q - s| - c.\]

Thus, the Senate accepts \( x' \) at the subgame where \( x' \) is chosen and \( B = b(x') \).

Now, consider the subgame where \( x \) is chosen and \( B = 0 \). Since the Senate accepts \( x \) at this subgame,

\[-|x - s| \geq -|q - s| - c.\]

Then,

\[-|x' - s| > -|x - s| \geq -|q - s| - c.\]

Thus, the Senate accepts \( x' \) at the subgame where \( x' \) is chosen and \( B = 0 \).

Above, I have shown that the Senate accepts \( x' \) at both subgames. Thus, the Senate plays \( a \) or \( aa \) for \( x' \). Then, compute

\[
u_P (x'; a) = -|x' - p| (1 + \delta) > -|x - p| (1 + \delta) \\
\geq -|q - p| - \delta |x - p| = u_P (x; aa).
\]

The strict inequality follows because \( x < x' = s \) or \( p = x' < x \), and the weak inequality holds because \( b(x) \geq 0 \). Similarly,

\[
u_P (x'; aa) > u_P (x; aa),
\]

since \( x < x' = s \) or \( p = x' < x \). \[\blacksquare\]
Lemma A.7 Suppose that the Senate plays \( ar \) at \( x \). If \( x < x' = s \) or \( p = x' < x \), the president prefers \( x' \) to \( x \) strictly.

**Proof.** Consider the subgame where \( x \) is chosen and \( B = b(x) \). Since the Senate accepts \( x \) at this subgame,

\[ -|x - s| + b(x) \geq -|q - s| - c. \]

Then,

\[ -|x' - s| + b(x') > -|x - s| + b(x) \geq -|q - s| - c. \]

Thus, the Senate accepts \( x' \) at the subgame where \( x' \) is chosen and \( B = b(x') \). Therefore, the Senate plays \( a, aa \) or \( ar \) for \( x' \). Then, obtain

\[ \min \{ u_P(x';a) , u_P(x';aa) , u_P(x';ar) \} > u_P(x;ar) \]

in the same way as in the proof of Lemma A.6. ■

Lemma A.8 Suppose that the Senate plays \( ra \) at \( x \). If \( x < x' = s \) or \( p = x' < x \), the president prefers \( x' \) to \( x \) strictly.

**Proof.** Step 1. \( b(x) = 0 \) and \( -|x - s| = -|q - s| - c \): Since \( ra \) is optimal at \( t = 2 \), I have

\[ -|x - s| + b(x) \leq -|q - s| - c \text{ and} \]
\[ -|x - s| \geq -|q - s| - c. \]

Since \( b(x) \geq 0 \), these inequalities imply \( b(x) = 0 \), which implies \( -|x - s| = -|q - s| - c \).

Step 2. The Senate plays \( a \) or \( aa \): Consider the subgame where \( x' \) is chosen and \( B \geq 0 \) is given. By the assumption and Step 1,

\[ -|x' - s| + B > -|x - s| = -|q - s| - c. \]

This implies that the Senate accepts \( x' \) at the \( t = 2 \) subgames regardless of \( B \). Therefore, the Senate plays \( a \) or \( aa \) for \( x' \).

Step 3. The president prefers \( x' \) to \( x \) strictly: By Step 2, it suffices to show that

\[ \min \{ u_P(x';a) , u_P(x';aa) \} > u_P(x;ra) . \]

This can be shown by noting that \( -|x' - p| > -|x - p| \) and \( b(x) = 0 \). ■
Turn to $x \in [s, p]$. Suppose $x < s$ or $x > p$. I will show that there is a better option $x'$ for the president.

First, suppose that the Senate plays $a$, $aa$, $ar$ or $ra$ at $x$. Take

$$x' = \begin{cases} 
s & \text{if } x < s \\
p & \text{if } x > p \end{cases}$$

Then, Lemmas A.5-A.8 imply that $x'$ is better to the president.

Since the Senate never plays $r$, suppose the Senate plays $rr$ at $x$. In each of the following cases, I will show that there is $x'$ that is better than $x$ to the president.

Case 1. $q \leq s$: Take $x' = 2s - q$. Since $|x' - s| = |q - s|$, Lemma A.4 implies that the Senate plays $a$ or $aa$ for $x'$. Then,

$$u_P(x'; a) > u_P(x'; aa) > -|q - p| (1 + \delta) = u_P(x; rr).$$

Both inequalities follow because $-|x' - p| > -|q - p|$.

Case 2. $s < q \leq p$: Take $x' = q + \min\left\{ \frac{q - s}{2}, \frac{p - q}{2} \right\}$. Then, the Senate plays $a$ or $aa$ for $x'$ by Lemma A.4 and the fact that $-|x' - s| > -|q - s| - c$. Thus, since $-|x' - p| \geq -|q - p|$ and $-|x' - p| > -|x - p|$, a simple computation gives

$$u_P(x'; a) \geq u_P(x'; aa) > u_P(x; rr).$$

Case 3. $q > p$: Take $x' = p$. Since $-|x' - s| > -|q - s| - c$, the Senate plays $a$ or $aa$ at $x'$ by Lemma A.4. Then, noting that $-|x' - p| > -|q - p|$, I have

$$u_P(x'; a) > u_P(x'; aa) > u_P(x; rr).$$

Proof of Proposition 2.2.

The proposition is proved in the following lemmas. In the following lemmas, $x$ is the president’s choice on any equilibria, and thus $x \in [s, p]$ and $b(x) \geq 0$. First, I show $D_1 < D_2 < D_3$.

Lemma A.9 $D_1 < D_2 < D_3$.

Proof. Note that $|a - b| \geq a - b$ for any $a, b \in \mathbb{R}$. Compute

$$D_2 - D_1 = c + \frac{\alpha \lambda \delta}{\alpha \lambda \delta + 1} (|p - q| + |q - s| - p + s)$$

$$\geq c + \frac{\alpha \lambda \delta}{\alpha \lambda \delta + 1} (p - q + q - s - p + s) = c > 0$$
and

\[
\begin{align*}
D_3 - D_2 &= \frac{\alpha}{1 - \alpha} (c + |p - q| + |q - s| - p + s) \\
&\geq \frac{\alpha}{1 - \alpha} (c + p - q + q - s - p + s) = \frac{\alpha}{1 - \alpha} c > 0.
\end{align*}
\]

Lemma A.10 If \( x < D_1 \), the Senate plays \( a \) for \( x \). If \( x > D_1 \), the Senate plays \( d \) for \( x \).

Proof. We show that \( u_S(a, x) > u_S(d, x) \). Note that

\[
\begin{align*}
u_S(a, x) - u_S(d, x) &= -|x - s|(1 + \delta) + |q - s| - \delta \delta \max\{-|x - s| + B, -|q - s| - c\} \\
&= z_S - \delta \lambda \max\{b(x), -z_S - c\} - \delta (1 - \lambda) \max\{0, -z_S - c\}
\end{align*}
\]

where \( z_S = -|x - s| + |q - s| \). By the assumption \( x < D_1 \), I have \( 0 > -z_S - c \). Also \( x < D_1 \) implies

\[
\begin{align*}
u_S(a, x) - u_S(d, x) &= z_S - \delta \lambda b(x) > 0.
\end{align*}
\]

Lemma A.11 If \( D_1 < x < D_2 \), the Senate plays \( aa \) for \( x \).

Proof. By Lemma A.10, the Senate plays \( d \) for \( x \). By \( x < D_2, -|x - s| > -|q - s| - c \).

By Lemma A.4, the Senate plays \( aa \). □

Lemma A.12 If \( D_2 < x < D_3 \), the Senate plays \( ar \) for \( x \).

Proof. By Lemma A.10, the Senate plays \( d \) for \( x \). By \( D_2 < x < D_3 \), I have

\[
-|x - s| + b(x) > -|q - s| - c > -|x - s|.
\]

The first inequality implies the Senate confirms \( x \) at \( t = 2 \) when \( B = b(x) \), and the second the Senate rejects \( x \) at \( t = 2 \) when \( B = 0 \). □
Lemma A.13 If $D_3 < x$, the Senate plays $rr$ for $x$.

**Proof.** By Lemma A.10, the Senate plays $d$ for $x$. By $D_3 < x$, I have

$$-|q - s| - c > -|x - s| + b(x).$$

Hence the Senate rejects $x$ at $t = 2$ when $B = b(x)$. Moreover, since $b(x) \geq 0$,

$$-|q - s| - c > -|x - s|.$$

Then, the Senate rejects $x$ at $t = 2$ when $B = 0$. ■

Now, turn to $x = D_1, D_2$ or $D_3$. Observe that

$$D_1 = \frac{1}{1 + \delta \lambda \alpha} (s + |q - s| - \delta \lambda \alpha (-p + |q - p|))$$

$$= \begin{cases} 
\frac{1}{\alpha \lambda \delta + 1} (2s - q + q \alpha \lambda \delta) & \text{if } q < s \\
q & \text{if } s \leq q < p \\
\frac{1}{\alpha \lambda \delta + 1} (q + 2p \alpha \lambda \delta - q \alpha \lambda \delta) & \text{if } p < q
\end{cases}.$$

The following lemma rules out $x = q$ in any equilibrium paths.

**Lemma A.14** $x \neq q$.

**Proof.** Suppose $x = q$ by contradiction. We will show that it contradicts $p \neq q$.

Recall that $x \in [s, p]$. Thus, $s \leq q < p$, which gives

$$D_1 = q$$

$$D_2 = q + c.$$ 

Take $x' = x + \varepsilon$ for $\varepsilon > 0$ small enough such that

$$D_1 < x' < D_2 \text{ and } -|x' - p| > -|x - p|. \tag{A.1}$$

The Senate plays $a$ or $aa$ for $x = q$, by Lemma A.2. Then,

$$u_P(x; a) = u_P(x; aa) = -|q - p| (1 + \delta).$$

However, the Senate plays $aa$ for $x'$ by Lemma A.11, and

$$u_P(x'; aa) > u_P(x; a) = u_P(x; aa)$$

by (A.1). Then, the president does not choose $x$ any equilibria. ■
Lemma A.15 If \( x = D_1 \), the Senate plays \( a \) for \( x \).

Proof. By Lemma A.14, \( x \neq q \).

Step 1. \(-|x - p| > -|q - p|\): Note that \( x \in [s, p] \) by Proposition 2.1. If \( q < s \),

\[
-|x - p| + |q - p| = x - q = \frac{1}{\alpha \lambda \delta + 1} (2s - q + q \alpha \lambda \delta) - q
\]

\[
= \frac{2}{\alpha \lambda \delta + 1} (s - q) > 0.
\]

If \( p < q \),

\[
-|x - p| + |q - p| = x + q - 2p = \frac{1}{\alpha \lambda \delta + 1} (q + 2p \alpha \lambda \delta - q \alpha \lambda \delta) + q - 2p
\]

\[
= \frac{2}{\alpha \lambda \delta + 1} (q - p) > 0.
\]

Step 2. The Senate plays \( a \) for \( x \): Suppose not. Then, the Senate plays \( d \) for \( x \). I will show that the president has an incentive to deviate from \( x \), so that \( x \) cannot be on any equilibrium paths. By Step 1,

\[
u_P(x; a) > \max \{ u_P(x; aa), u_P(x; ar), u_P(x; ra), u_P(x; rr) \}.
\]

Take \( x' = x - \varepsilon \) such that \( \varepsilon > 0 \) is small enough to satisfy

\[
u_P(x; a) > u_P(x'; a) > \max \{ u_P(x; aa), u_P(x; ar), u_P(x; ra), u_P(x; rr) \}.
\]

By Step 1, \( x \) lies in the interior of \( X \) and \( x' \) can be taken to lie in \( X \). Moreover, the first inequality follows by \( x' < x \leq p \). The Senate plays \( a \) for \( x' \) since \( x' < D_1 \) by Lemma A.10. Therefore, the president has an incentive to deviate to \( x' \). \( \blacksquare \)

Lemma A.16 If \( x = D_2 \), the Senate plays \( aa \) for \( x \).

Proof. Step 1. \(-|x - p| > -|q - p|\): Since \( x \leq p \) by Proposition 2.1,

\[
-|x - p| + |q - p| = x - p + |q - p|
\]

\[
= s + |q - s| + c - p + |q - p|
\]

\[
\geq s + q - s + c - p + p - q
\]

\[
= c > 0.
\]
Step 2. The Senate plays $aa$ for $x$: Suppose not. By $x > D_1$ and Lemma A.10, the Senate does not play $a$. Moreover a simple computation gives

$$u_S(aa, x) = u_S(ar, x) > u_S(ra, x) = u_S(rr, x).$$

Therefore, the Senate should play $ar$ for $x$. Then, I will show that the president has an incentive to deviate from $x$, so that $x$ cannot be on any equilibrium paths. By Step 1,

$$u_P(x; aa) > u_P(x; ar).$$

Take $x' = x - \varepsilon$ such that $\varepsilon > 0$ is small enough to satisfy $D_1 < x' < D_2$ and

$$u_P(x; aa) > u_P(x'; aa) > u_P(x; ar).$$

By Step 1, $x$ lies in the interior of $X$ and $x'$ can be taken to lie in $X$. Moreover, the first inequality follows by $x' < x \leq p$. The Senate plays $aa$ for $x'$ since $D_1 < x' < D_2$ by Lemma A.11. Therefore, the president has an incentive to deviate to $x'$. $lacksquare$

**Lemma A.17** If $x = D_3$, the Senate plays $ar$ for $x$.

**Proof.** Step 1. $-|x - p| > -|q - p|$: Since $x \leq p$ by Proposition 2.1,

$$-|x - p| + |q - p|$$

$$= x - p + |q - p|$$

$$= \frac{1}{1 - \alpha} (c - p + s + |p - q| + |q - s|)$$

$$\geq \frac{1}{1 - \alpha} (c - p + s + p - q + q - s)$$

$$= \frac{1}{1 - \alpha} c > 0.$$

Step 2. The Senate plays $ar$ for $x$: Suppose not. By $x > D_1$ and Lemma A.10, the Senate does not play $a$. Moreover a simple computation gives

$$u_S(rr, x) = u_S(ar, x) > u_S(ra, x) = u_S(aa, x).$$

Therefore, the Senate should play $rr$ for $x$. Then, I will show that the president has an incentive to deviate from $x$, so that $x$ cannot be on any equilibrium paths. By Step 1,

$$u_P(x; ar) > u_P(x; rr).$$
Take \( x' = x - \varepsilon \) such that \( \varepsilon > 0 \) is small enough to satisfy \( D_2 < x' < D_3 \) and

\[
up(x;ar) > up(x';ar) > up(x;rr).
\]

By Step 1, \( x \) lies in the interior of \( X \) and \( x' \) can be taken to lie in \( X \). Moreover, the first inequality follows by \( x' < x \leq p \). The Senate plays \( ar \) for \( x' \) since \( D_2 < x' < D_3 \) by Lemma A.12. Therefore, the president has an incentive to deviate to \( x' \). ■

**Proof of Proposition 2.3.**

Throughout this proof, I assume that \( x \) is the president’s choice and thus \( x \in [s, p] \) and \( b(x) \geq 0 \). Also I ignore the restriction of \( X \) until Lemma A.32 is prove. Based on Proposition 2.2, the president’s expected utility from choosing \( x \) is as follows:

\[
Eu_P(x) = \begin{cases} 
V_a(x) & \text{if } x \leq D_1 \text{ (a by the Senate)} \\
V_{aa}(x) & \text{if } D_1 < x \leq D_2 \text{ (aa by the Senate)} \\
V_{ar}(x) & \text{if } D_2 < x \leq D_3 \text{ (ar by the Senate)} \\
V_{rr}(x) & \text{if } D_3 < x \text{ (rr by the Senate)} 
\end{cases}
\]

where

\[
V_a(x) = up(x;a) = -(1 + \delta) |x - p|
\]

\[
V_{aa}(x) = up(x;aa)
\]

\[
= -(1 + \delta \lambda \alpha) |q - p| - \delta (1 - \lambda \alpha) |x - p|
\]

\[
V_{ar}(x) = up(x;ar)
\]

\[
= -(1 + \delta (1 - \lambda + \lambda \alpha)) |q - p| - \delta \lambda (1 - \alpha) |x - p|
\]

\[
V_{rr}(x) = up(x;rr) = -|q - p| (1 + \delta).
\]

By the following lemma, \( V_{rr}(x) \) may be ignored.

**Lemma A.18** In equilibrium, the president does not choose \( x \) such that \( x > D_3 \).

**Proof.** The Senate plays \( rr \) for \( x > D_3 \) by Proposition 2.2. Moreover, the Senate plays \( a \) or \( aa \) for \( q \) by Lemma A.2. Observe that

\[
up(x;rr) = up(q;a) = up(q;aa).
\]

Then, by Assumption 1, the president does not choose \( x > D_3 \). ■
I need to solve $\max_{x \in X} E_{u_P} (x)$. Let

$$W_a (q) = \max_{x \leq D_1} V_a (x),$$
$$W_{aa} (q) = \max_{D_1 < x \leq D_2} V_{aa} (x) \text{ and}$$
$$W_{ar} (q) = \max_{D_2 < x \leq D_3} V_{ar} (x),$$

and define $W_{delay} (q) = \max \{ W_{aa} (q), W_{ar} (q) \}$. By the Maximum Theorem, $W_a$, $W_{aa}$ and $W_{ar}$ are continuous in $q$.

**Lemma A.19** $\max_{x \in X} E_{u_P} (x) = \max \{ W_a (q), W_{aa} (q), W_{ar} (q) \}$. Consequently, on the equilibrium path, the Senate delays if and only if $\max_{x \in X} E_{u_P} (x) > W_a (q)$.

**Proof.** By Lemma A.18, $x$ cannot be a solution to $\max_{x \in X} E_{u_P} (x)$ if $x > D_3$. Thus, I have $\max_{x \in X} E_{u_P} (x) = \max \{ W_a (q), W_{aa} (q), W_{ar} (q) \}$.

Now show that delay happens if and only if $W_a (q) < W_{delay} (q)$. The (if) is straightforward. For (only if), assume $W_a (q) \geq W_{delay} (q)$. If $W_a (q) > W_{delay} (q)$, the president’s optimal $x$ will lead to immediate acceptance by the Senate. If $W_a (q) = W_{delay} (q)$, Assumption 1 implies that the Senate’s decision will be delayed.

Clearly, $W_a (q) < W_{delay} (q)$ is equivalent to $W_a (q) < \max_{x \in X} E_{u_P} (x)$.  

In the next 3 lemmas, I compute $W_a$, $W_{aa}$ and $W_{ar}$ by considering 3 cases — $q < s < p$, $s \leq q < p$ and $s < p < q$. For the rest of this paper, I may use the functional form of $W_a$, $W_{aa}$ and $W_{ar}$, without explicitly referring to the following 3 lemmas.

For the first case, let

$$\tilde{q}_1 = s - (p - s) \frac{1 + \delta \lambda \alpha}{1 - \delta \lambda \alpha},$$
$$\tilde{q}_2 = s - (p - s) + c \text{ and}$$
$$\tilde{q}_3 = s - (p - s) \frac{1 - \alpha}{1 + \alpha} + \frac{1}{1 + \alpha} c.$$

**Lemma A.20** Suppose $q < s < p$. Then,

$$W_a (q) = \begin{cases} 
0 & \text{if } q \leq \tilde{q}_1, \\
(s - p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (s - q)) \cdot (1 + \delta) & \text{if } \tilde{q}_1 < q.
\end{cases}, \quad (A.2)$$

$$\arg \max_{x \leq D_1} V_a (x) = \begin{cases} 
p & \text{if } q < \tilde{q}_1, \\
D_1 & \text{if } \tilde{q}_1 < q.
\end{cases}$$
\( W_{aa}(q) = \begin{cases} 
q \left( 1 + \delta \lambda \alpha + \frac{1-\delta \lambda \alpha}{1+\delta \lambda \alpha} (1-\lambda \alpha) \right) - p \left( 1 + 2\delta \lambda \alpha - \delta \right) - s \frac{2\delta (1-\lambda \alpha)}{1+\delta \lambda \alpha} & \text{if } q \leq \bar{q}_1 \\
(\bar{q}_1 - p) \left( 1 + \delta \lambda \alpha \right) & \text{if } \bar{q}_1 < q \leq \bar{q}_2 \\
q \left( 1 + 2\delta \lambda \alpha - \delta \right) - p \left( 1 + \delta \right) + (2s + c) \delta (1-\lambda \alpha) & \text{if } \bar{q}_2 < q 
\end{cases} \)

\[ (A.3) \]

\[
\text{argmax}_{D_1 < x \leq D_2} V_{aa}(x) = \begin{cases} 
D_1 & \text{if } q < \bar{q}_1 \\
p & \text{if } \bar{q}_1 < q < \bar{q}_2 \\
D_2 & \text{if } \bar{q}_2 < q 
\end{cases} \]

\[ (A.4) \]

\[
W_{ar}(q) = \begin{cases} 
q \left( 1 + \delta \lambda \alpha - p \left( 1 + \delta - 2\delta \lambda + 2\delta \lambda \alpha \right) - (2s + c) \delta \lambda (1-\alpha) \right) & \text{if } q \leq \bar{q}_2 \\
(\bar{q}_2 - p) \left( 1 + \delta + \delta \lambda \alpha - \delta \lambda \right) & \text{if } \bar{q}_2 < q \leq \bar{q}_3 \\
q \left( 1 - 2\delta \lambda + \delta \right) - p \left( 1 + \delta \right) + (2s + c) \lambda \delta & \text{if } \bar{q}_3 < q 
\end{cases} \]

\[
\text{argmax}_{D_2 < x \leq D_3} V_{ar}(x) = \begin{cases} 
D_2 & \text{if } q < \bar{q}_2 \\
p & \text{if } \bar{q}_2 < q < \bar{q}_3 \\
D_3 & \text{if } \bar{q}_3 < q 
\end{cases} \]

\[
\text{Proof.} \text{ For } q < s < p,
\]

\[
D_1 = s + \frac{1-\delta \lambda \alpha}{1+\delta \lambda \alpha} (s-q), \\
D_2 = s + (s-q) + c, \text{ and} \\
D_3 = s + \frac{1+\alpha}{1-\alpha} (s-q) + \frac{1}{1-\alpha} c.
\]

\[
\text{Compute}
\]

\[
W_a(q) = \max_{x \leq D_1} V_a(x) = \max_{x \leq D_1} (x-p) \cdot (1+\delta) \\
= \begin{cases} 
0 & \text{if } p \leq D_1 \\
(D_1 - p) \cdot (1+\delta) & \text{if } D_1 < p 
\end{cases} 
\]

Replacing \( D_1 = s + \frac{1-\delta \lambda \alpha}{1+\delta \lambda \alpha} (s-q) \) and rearranging gives the desired result. Move on to

\[
W_{aa}(q) = \max_{D_1 < x \leq D_2} V_{aa}(x) = \max_{D_1 < x \leq D_2} (q-p) \left( 1 + \delta \lambda \alpha \right) - (D_1 - p) \delta \alpha (1-\lambda \alpha) \\
= \begin{cases} 
(q-p) \left( 1 + \delta \lambda \alpha \right) - (D_1 - p) \delta \alpha & \text{if } p < D_1 \\
(q-p) \left( 1 + \delta \lambda \alpha \right) & \text{if } D_1 \leq p \leq D_2 \\
(q-p) \left( 1 + \delta \lambda \alpha \right) + (D_2 - p) \delta \alpha & \text{if } D_2 < p 
\end{cases} 
\]
Again, replace $D_1$ and $D_2$, and rearrange terms to get the result. Finally,

$$W_{ar} (q) = \max_{D_2 \leq x \leq D_3} \max_{D_2 \leq x \leq D_3} (q - p) \left( 1 + \delta \lambda \alpha + \delta (1 - \lambda) \right) - |x - p| \delta \lambda (1 - \alpha)$$

$$= \begin{cases} (q - p) \left( 1 + \delta \lambda \alpha + \delta (1 - \lambda) \right) & \text{if } p < D_2 \\ (q - p) \left( 1 + \delta \lambda \alpha + \delta (1 - \lambda) \right) & \text{if } D_2 \leq p \leq D_3 \\ (q - p) \left( 1 + \delta \lambda \alpha + \delta (1 - \lambda) \right) + (D_3 - p) \delta \lambda (1 - \alpha) & \text{if } D_3 < p \end{cases} .$$

Similarly, replace $D_2$ and $D_3$ to get the result. ■

**Lemma A.21** Suppose $s \leq q < p$. Then,

$$W_a (q) = (q - p) \cdot (1 + \delta),$$

$$\text{argmax}_{x \leq D_1} V_a (x) = D_1,$$

$$W_{aa} (q) = \begin{cases} (q - p) \left( 1 + \delta \lambda \alpha \right) & \text{if } p - c \leq q \leq p \\ (q - p) \left( 1 + \delta \lambda \alpha + c \delta (1 - \lambda) \right) & \text{if } q < p - c \end{cases} ,$$

$$\text{argmax}_{D_1 \leq x \leq D_2} V_{aa} (x) = \begin{cases} p & \text{if } p - c < q \leq p \\ D_2 & \text{if } q < p - c \end{cases} ,$$

$$W_{ar} (q) = \begin{cases} (q - p) \left( 1 + 2 \delta \lambda \alpha + \delta - 2 \lambda \delta \right) - c \delta \lambda (1 - \alpha) & \text{if } p - \frac{1}{1-\alpha} c < q < p - c \text{, and} \\ (q - p) \left( 1 + \delta \lambda \alpha \right) + c \delta \lambda (1 - \alpha) & \text{if } q < p - \frac{1}{1-\alpha} c \end{cases} ,$$

$$\text{argmax}_{D_2 \leq x \leq D_3} V_{ar} (x) = \begin{cases} D_2 & \text{if } p - c < q \\ p & \text{if } p - \frac{1}{1-\alpha} c \leq q \leq p - c \\ D_3 & \text{if } q < p - \frac{1}{1-\alpha} c \end{cases} .$$

**Proof.** For $s \leq q < p$,

$$D_1 = q,$$

$$D_2 = q + c, \text{ and}$$

$$D_3 = q + \frac{1}{1-\alpha} c .$$

Note that $p > D_1$. Compute

$$W_a (q) = \max_{x \leq D_1} V_a (x) = \max_{x \leq D_1} - |x - p| \cdot (1 + \delta)$$

$$= (D_1 - p) \cdot (1 + \delta) = (q - p) \cdot (1 + \delta) .$$
Move on to
\[
W_{aa} (q) = \max_{D_1 \leq x \leq D_2} V_{aa} (x) = \max_{D_1 \leq x \leq D_2} (q - p) (1 + \delta \lambda \alpha) - |x - p| \delta (1 - \lambda \alpha)
\]
\[
= \begin{cases} 
(q - p) (1 + \delta \lambda \alpha) & \text{if } D_1 < p \leq D_2 \\
(q - p) (1 + \delta \lambda \alpha) + (D_2 - p) \delta (1 - \lambda \alpha) & \text{if } D_2 < p 
\end{cases}.
\]

Replace \(D_1 = q\) and \(D_2 = q + c\), and rearrange terms to get the result. Finally,
\[
W_{ar} (q) = \max_{D_2 \leq x \leq D_3} V_{ar} (x) = \max_{D_2 \leq x \leq D_3} (q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - |x - p| \delta \lambda (1 - \alpha)
\]
\[
= \begin{cases} 
(q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - (D_2 - p) \delta \lambda (1 - \alpha) & \text{if } p < D_2 \\
(q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) & \text{if } D_2 \leq p \leq D_3 \\
(q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) + (D_3 - p) \delta \lambda (1 - \alpha) & \text{if } D_3 < p 
\end{cases}.
\]

Similarly, replace \(D_2\) and \(D_3\) to get the result. \(\blacksquare\)

**Lemma A.22** Suppose \(s < p < q\). Then,
\[
W_a (q) = 0, \ \arg\max_{x \leq D_1} V_a (x) = p,
\]
\[
W_{aa} (q) = -(q - p) \left( 1 + \delta \lambda \alpha + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} \delta (1 - \lambda \alpha) \right), \ \arg\max_{D_1 \leq x \leq D_2} V_{aa} (x) = D_1,
\]
\[
W_{ar} (q) = -(q - p) (1 + \delta) - c \delta \lambda (1 - \alpha), \ \arg\max_{D_2 \leq x \leq D_3} V_{ar} (x) = D_2.
\]

Consequently, the present chooses \(x = p\), and the Senate confirms the nomination at \(t = 1\).

**Proof.** For \(s < p < q\),
\[
D_1 = p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (q - p),
\]
\[
D_2 = q + c, \ \text{and}
\]
\[
D_3 = p + \frac{1 + \alpha}{1 - \alpha} (q - p) + \frac{1}{1 - \alpha} c.
\]

Note that \(p < D_1\). Compute
\[
W_a (q) = \max_{x \leq D_1} V_a (x) = \max_{x \leq D_1} -|x - p| \cdot (1 + \delta) = 0.
\]
Move on to
\[
W_{aa} (q) = \max_{D_1 \leq x \leq D_2} V_{aa} (x) = \max_{D_1 \leq x \leq D_2} (q - p) (1 + \delta \lambda \alpha) - |x - p| \delta (1 - \lambda \alpha)
\]
\[
= -(q - p) (1 + \delta \lambda \alpha) - (D_1 - p) \delta (1 - \lambda \alpha)
\]
\[
= -(q - p) (1 + \delta \lambda \alpha) - \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (q - p) \delta (1 - \lambda \alpha)
\]
\[
= -(q - p) \left( 1 + \delta \lambda \alpha + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} \delta (1 - \lambda \alpha) \right).
\]
Finally,
\[
W_{ar} (q) = \max_{D_2 \leq x \leq D_3} V_{ar} (x) = \max_{D_2 \leq x \leq D_3} (q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - |x - p| \delta \lambda (1 - \alpha)
\]
\[
= -(q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - (D_2 - p) \delta \lambda (1 - \alpha)
\]
\[
= -(q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - (q + c - p) \delta \lambda (1 - \alpha)
\]
\[
= -(q - p) (1 + \delta) - c \delta \lambda (1 - \alpha).
\]
Clearly, \(W_a (q) = 0 > W_{aa} (q)\) and \(W_a (q) = 0 > W_{ar} (q).\)

Now I prove some properties of \(W_a, W_{aa}\) and \(W_{ar}.\)

**Lemma A.23** If \(q \leq \bar{q}_1,\) then \(W_a (q) = 0 > W_{aa} (q)\) and \(0 > W_{ar} (q).\)

**Proof.** Suppose \(q \leq \bar{q}_1.\) Clearly, \(W_a (q) = 0.\) By Lemma A.20, \(W_{aa} (q)\) and \(W_{ar} (q)\) are strictly increasing in \(q\) for \(q < s.\) Since \(W_{aa} (q)\) and \(W_{ar} (q)\) are continuous, they are strictly increasing for \(q \leq s.\) Therefore, \(0 \geq W_{aa} (s) > W_{aa} (q),\) for \(q \leq \bar{q}_1 < s.\) Similarly, \(0 > W_{ar} (q)\) for \(q \leq \bar{q}_1.\)

**Lemma A.24** \(W_{aa} (q) > W_{ar} (q)\) if \(\bar{q}_1 < q \leq \min \{ \bar{q}_2, s \}.\)

**Proof.** Note that \(\bar{q}_1 < q \leq \bar{q}_2\) and \(q \leq s.\) Then, by Lemma A.20,
\[
W_{aa} (q) = (q - p) (1 + \delta \lambda \alpha).
\]
Since \(q < \bar{q}_2,\) \(p < D_2.\) Thus,
\[
W_{ar} (q) = \max_{D_2 \leq x \leq D_3} V_{ar} (x)
\]
\[
= \max_{D_2 \leq x \leq D_3} (q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - |x - p| \delta \lambda (1 - \alpha)
\]
\[
= (q - p) (1 + \delta \lambda \alpha + \delta (1 - \lambda)) - (D_2 - p) \delta \lambda (1 - \alpha)
\]
\[
= W_{aa} (q) - (p - q) \delta (1 - \lambda) - (D_2 - p) \delta \lambda (1 - \alpha)
\]
\[
< W_{aa} (q).
\]
Lemma A.25 Suppose $q < s < p$. Then,

$$W_{aa}(q) < W_{ar}(q) \text{ for all } q \geq \bar{q}_3$$

or

$$W_{aa}(q) > W_{ar}(q) \text{ for all } q \geq \bar{q}_3$$

or

$$W_{aa}(q) = W_{ar}(q) \text{ for all } q \geq \bar{q}_3.$$ 

Proof. For $q \geq \bar{q}_3$, use Lemma A.20 to compute

$$W_{aa}(q) - W_{ar}(q) = -\delta(\lambda + \alpha \lambda - 1)(c + 2(s - q)).$$

Since $c + 2(s - q) > 0$, the sign of $\lambda + \alpha \lambda - 1$ determines that of $W_{aa}(q) - W_{ar}(q)$, which implies the required result.

Lemma A.26 Suppose $s \leq q < p$. Then,

i) $W_a(q) < W_{aa}(q)$ and

ii) $W_{aa}(q) - W_{ar}(q)$ is constant in $q$ for $q < p - \frac{1}{1-\alpha}c$,

iii) $W_{aa}(q) - W_{ar}(q)$ is strictly increasing in $q$ for $p - \frac{1}{1-\alpha}c < q < p - c$, and

iv) $W_{aa}(q) \geq W_{ar}(q)$ for $p - c < q$.

Proof. Use Lemma A.20 to confirm. For i), compute

$$W_a(q) - W_{aa}(q) = \begin{cases} (q - p) \delta(1 - \lambda \alpha) & \text{if } p - c \leq q \leq p \\ -c\delta(1 - \lambda \alpha) & \text{if } q < p - c \end{cases} < 0.$$ 

For the rest, compute

$$W_{aa}(q) - W_{ar}(q) = \begin{cases} -(q - p) \delta(1 - 2\lambda + \lambda \alpha) + c\delta \lambda(1 - \alpha) & \text{if } p - c < q \\ (q - p) \delta \lambda(1 - \alpha) + c\delta(1 - \lambda \alpha) & \text{if } p - \frac{1}{1-\alpha}c < q < p - c \\ c\delta(1 - \lambda \alpha - \lambda) & \text{if } q < p - \frac{1}{1-\alpha}c \end{cases}. $$

Then, ii) and iii) are clear. For iv), assume $0 < -(q - p) < c$. If $1 - 2\lambda + \lambda \alpha \geq 0$,

$$W_{aa}(q) - W_{ar}(q) = -(q - p) \delta(1 - 2\lambda + \lambda \alpha) + c\delta \lambda(1 - \alpha) > 0.$$
If $1 - 2\lambda + \lambda\alpha < 0$,

$$W_{aa}(q) - W_{ar}(q) > c\delta (1 - 2\lambda + \lambda\alpha) + c\delta\lambda (1 - \alpha)$$
$$= c\delta (1 - \lambda) > 0.$$ 

Now I can prove Proposition 2.3. I will consider which is the biggest among $W_a(q)$, $W_{aa}(q)$ and $W_{ar}(q)$, and then use Lemma A.20-A.22 to obtain the best choice of the president.

Proposition 2.3-i): Assume $q < \bar{q}_1$. Lemma A.23 and $\text{argmax}_{x \leq p_1} V_a(x)$ in Lemma A.20 imply that $p$ is the best choice for the president.

Proposition 2.3-ii): Assume $\bar{q}_1 < q < s$. By Lemmas A.24 and A.25 and the fact that $W_{aa}$ and $W_{ar}$ are linear in $[\bar{q}_2, \bar{q}_3]$, $W_{aa}$ and $W_{ar}$ satisfy either a) $W_{aa}(q) > W_{ar}(q)$ for all $q \geq \bar{q}_1$ or b)

$$W_{aa}(q) > W_{ar}(q) \text{ for } q < q^* \text{ and}$$
$$W_{aa}(q) \leq W_{ar}(q) \text{ for } q \geq q^*.$$ 

Here $q^* \in (\bar{q}_2, \bar{q}_3]$. Since $W_a(q)$ is strictly decreasing and $W_{aa}(q)$ and $W_{ar}(q)$ are strictly increasing, all of the 3 sets,

$$Q_{a1} \equiv \{ q : W_a(q) \geq W_{aa}(q), W_a(q) \geq W_{ar}(q) \},$$
$$Q_{a2} \equiv \{ q : W_{aa}(q) \geq W_a(q), W_{aa}(q) \geq W_{ar}(q) \} \text{ and}$$
$$Q_{\lambda} \equiv \{ q : W_{ar}(q) \geq W_a(q), W_{ar}(q) \geq W_{aa}(q) \}$$

are (possibly empty) intervals, and for each $q_{a1} \in Q_{a1}, q_{a2} \in Q_{a2}$ and $q_{\lambda} \in Q_{\lambda}$,

$q_{a1} \leq q_{a2} \leq q_{\lambda}.$ 

Then, use Lemma A.20 to get the best choice for the president, as $q$ increases.

Proposition 2.3-iii): Suppose $s < q < p$. By Lemma A.26.i), it suffices to consider $W_{aa}(q)$ and $W_{ar}(q)$. Since $W_{aa}(q)$ and $W_{ar}(q)$ are continuous, Lemma A.26.ii)-iv) implies that at least one of the following holds – either a) $W_{aa}(q) \geq W_{ar}(q)$ for all $q \in (s, p)$, or b)

$$W_{aa}(q) < W_{ar}(q) \text{ for } q < q^* \text{ and}$$
$$W_{aa}(q) \geq W_{ar}(q) \text{ for } q \geq q^*.$$ 

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Here, \( q^* \in \left[ p - \frac{1}{1-\alpha} c, p - c \right] \). Then, use Lemma A.21 to get the best choice for the president, as \( q \) increases.

Proof of Proposition 2.4.

The delay area is characterized in Lemma A.29. First, I need some lemmas.

**Lemma A.27** Suppose \( q < s < p \). Then, \( W_a(q) \) is weakly decreasing in \( q \) and \( W_{\text{delay}}(q) \) is strictly increasing in \( q \). Moreover, both functions are continuous in \( q \).

**Proof.** Let \( \gamma_{a1}, \gamma_{a2}, \) and \( \gamma_\lambda \) denote the slopes of \( W_a(q), W_{aa}(q) \) and \( W_{ar}(q) \), respectively. From A.20,

\[
\gamma_{a1} = \begin{cases} 
0 & \text{if } q \leq \bar{q}_1 \\
-(1+\delta) \frac{1-\delta \lambda \alpha}{1+\delta \lambda \alpha} & \text{if } \bar{q}_1 < q 
\end{cases}
\]

\[
\gamma_{a2} = \begin{cases} 
1 + \delta \lambda \alpha + \frac{1-\delta \lambda \alpha}{1+\delta \lambda \alpha} (1 - \lambda \alpha) & \text{if } q \leq \bar{q}_1 \\
1 + \delta \lambda \alpha & \text{if } \bar{q}_1 < q \leq \bar{q}_2, \text{ and} \\
1 + \delta (2\lambda \alpha - 1) & \text{if } \bar{q}_2 < q 
\end{cases}
\]

\[
\gamma_\lambda = \begin{cases} 
1 + \delta & \text{if } q \leq \bar{q}_2 \\
1 + \delta (1 - \lambda) + \delta \lambda \alpha & \text{if } \bar{q}_2 < q \leq \bar{q}_3 \\
1 + \delta (1 - 2\lambda) & \text{if } \bar{q}_3 < q 
\end{cases}
\]

Since \( \gamma_{a1} \leq 0 \), \( W_a(q) \) is weakly decreasing in \( q \). For \( \gamma_{a2} \) and \( \gamma_\lambda \), note that

\[
1 + \delta (2\lambda \alpha - 1) > 1 - \delta > 0 \\
1 + \delta (1 - 2\lambda) > 1 - \delta > 0
\]

since \( 0 < \lambda < 1 \) and \( 0 < \delta < 1 \). Thus, both \( \gamma_{a2} \) and \( \gamma_\lambda \) is positive for all \( q \). Therefore, \( W_{\text{delay}}(q) \) is strictly decreasing in \( q \). Both functions are continuous by the Maximum Theorem.

**Lemma A.28** There is a unique \( \kappa \) such that \( W_a(\kappa) = W_{\text{delay}}(\kappa) \) and \( s + (s - p) \frac{1+\delta \lambda \alpha}{1-\delta \lambda \alpha} < \kappa < s \).

**Proof.** Recall that \( \bar{q}_1 = s + (s - p) \frac{1+\delta \lambda \alpha}{1-\delta \lambda \alpha} \). I claim that \( W_a(\bar{q}_1) > W_{\text{delay}}(\bar{q}_1) \) and \( W_a(s) < W_{\text{delay}}(s) \). The first inequality is implied by Lemma A.23. For the second one, consider two cases.
Case 1. \( \bar{q}_1 < s \leq \bar{q}_2 \): Compute that

\[
W_a (s) = -(p - s)(1 + \delta) \quad \text{and} \quad W_{aa} (s) = -(p - s)(1 + \delta \lambda \alpha).
\]

Thus, \( W_a (s) < W_{aa} (s) \leq W_{\text{delay}} (s) \).

Case 2. \( \bar{q}_2 < s \): Compute that

\[
W_a (s) = -(p - s)(1 + \delta) \quad \text{and} \quad W_{aa} (s) = -(p - s)(1 + \delta) + c\delta (1 - \alpha \lambda).
\]

Thus, \( W_a (s) < W_{aa} (s) \leq W_{\text{delay}} (s) \).

Thus, I have proved that \( W_a (\bar{q}_1) > W_{\text{delay}} (\bar{q}_1) \) and \( W_a (s) < W_{\text{delay}} (s) \). By Lemma A.27, there is a unique \( \kappa \) such that \( s + (s - p)(1 + \delta \lambda \alpha) < \kappa < s \) and \( W_a (\kappa) = W_{\text{delay}} (\kappa) \). □

Define \( \kappa \) to be the unique solution in Lemma A.28.

**Lemma A.29** Along any equilibrium paths, the Senate delays its decision until \( t = 2 \) if and only if \( \kappa < q < p \).

**Proof.** Note that the delay area is

\[
\{ q : W_a (q) < W_{\text{delay}} (q) \}.
\]

By Lemma A.26-i),

\[
(s, p) \subset \{ q : W_a (q) < W_{\text{delay}} (q) \},
\]

and Lemma A.22 implies that

\[
[p, \infty) \cap \{ q : W_a (q) < W_{\text{delay}} (q) \} = \emptyset.
\]

Thus, Lemma A.27 implies that the delay area is an interval. Therefore, \( \kappa \) is the left endpoint of the delay area, and \( p \) is the right endpoint. □

**Lemma A.30** If \( c \) goes up, \( \kappa \) becomes weakly smaller. That is, \( \frac{\partial \kappa}{\partial c} \leq 0 \) whenever \( \kappa \) is differentiable w.r.t \( c \). Moreover, \( \kappa \) is differentiable w.r.t \( c \) except finite number of points of \( c \).
Proof. Recall that $\kappa$ is the unique solution to $W_a(\kappa) = W_{delay}(\kappa)$ and $\bar{q}_1 = s + (s - p) \frac{1+\delta\lambda_0}{1-\delta\lambda_0} < \kappa < s$. Let $\kappa(c)$ be the solution for $c$. Since $W_a$ and $W_{delay}$ are specified piecewise in Lemma A.20, non-differentiability may occur at the boundaries of each interval, which will be only finite number of points.

Assume $c < c'$ and $\kappa(c) < \kappa(c')$, and find a contradiction to prove the required property that $\frac{\partial \kappa}{\partial c} \leq 0$. To make the notations clear, say $\kappa(c)$ to be the solution to $W_a(q; c) = W_{delay}(q; c)$.

First note that $W_a(q; c) = W_a(q; c')$ for all $q > \bar{q}_1$ by (A.2).

Second, consider two cases to show that $W_{delay}(q; c)$ is (weakly) increasing in $c$ for $q < s$.

Case 1. $\kappa \leq \bar{q}_2$: Noting that $\bar{q}_1 < \kappa < \min\{\bar{q}_2, s\}$, I see that $W_{delay}(\kappa) = W_{aa}(\kappa)$ by Lemma A.24. Then, by (A.3), $W_{aa}(\kappa; c)$ is weakly increasing in $c$.

Case 2. $\kappa > \bar{q}_2$: Consider (A.3) and (A.4) to see that $W_{delay}(q; c) \leq W_{delay}(q; c')$ for $\kappa > \bar{q}_2$.

Now, note that

$$W_{delay}(\kappa(c); c) = W_a(\kappa(c); c) > W_a(\kappa(c'); c) = W_a(\kappa(c'); c') = W_{delay}(\kappa(c'); c').$$

The inequality follows by Lemma A.27. Also note that

$$W_{delay}(\kappa(c); c) < W_{delay}(\kappa(c'); c) \leq W_{delay}(\kappa(c'); c'),$$

which is a contradiction. Here, the strict inequality holds by Lemma A.27. ■

Lemma A.31 If $p$ goes up, $\kappa$ becomes smaller. That is, $\frac{\partial \kappa}{\partial p} \leq 0$ whenever $\kappa$ is differentiable w.r.t $p$. Moreover, $\kappa$ is differentiable w.r.t $p$ except finite number of points of $p$.

Proof. Recall that $\kappa$ is the unique solution to $W_a(\kappa) = W_{delay}(\kappa)$ and $\bar{q}_1 = s + (s - p) \frac{1+\delta\lambda_0}{1-\delta\lambda_0} < \kappa < s$. Since $W_a$ and $W_{delay}$ are specified piecewise in Lemma A.20, I consider the following cases. In each case, I show that the solution $\kappa$ satisfies the required property that $\frac{\partial \kappa}{\partial p} \leq 0$. Non-differentiability may occur at the boundaries of each case, which will be only finite number of points.

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Case 1. $\bar{q}_1 \leq \kappa \leq \bar{q}_2$: By Lemma A.24, $W_{\text{delay}}(\kappa) = W_{aa}(\kappa)$. Thus, $\kappa$ is the solution to

$$W_a(\kappa) = W_{aa}(\kappa).$$

By Lemma A.20,

$$\left(s - p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (s - \kappa)\right) \cdot (1 + \delta) = (\kappa - p) (1 + \delta \lambda \alpha). \quad (A.5)$$

Differentiation gives

$$\left(-dp - \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} d\kappa\right) (1 + \delta) = (d\kappa - dp) (1 + \delta \lambda \alpha)$$

and

$$\frac{\partial \kappa}{\partial p} < 0.$$

Case 2. $\bar{q}_2 \leq q \leq \bar{q}_3$: $\kappa$ is the solution either to $W_a(\kappa) = W_{aa}(\kappa)$ or $W_a(\kappa) = W_{ar}(\kappa)$. First, if $W_a(\kappa) = W_{aa}(\kappa)$ holds,

$$\left(s - p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (s - \kappa)\right) \cdot (1 + \delta) = \kappa (1 + 2 \delta \lambda \alpha - \delta) - p (1 + \delta) + (2s + c) \delta (1 - \lambda \alpha). \quad (A.6)$$

Differentiation gives

$$\left(-dp - \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} d\kappa\right) (1 + \delta) = (1 + 2 \delta \lambda \alpha - \delta) d\kappa - (1 + \delta) dp$$

and

$$\frac{\partial \kappa}{\partial p} = 0.$$

If $W_a(\kappa) = W_{ar}(\kappa)$ holds,

$$\left(s - p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (s - \kappa)\right) \cdot (1 + \delta) = (\kappa - p) (1 + \delta + \delta \lambda \alpha - \delta \lambda). \quad (A.7)$$

Differentiate to obtain

$$\left(-dp - \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} d\kappa\right) (1 + \delta) = (d\kappa - dp) (1 + \delta + \delta \lambda \alpha - \delta \lambda)$$

and

$$\frac{\partial \kappa}{\partial p} < 0.$$
Case 3.\( \tilde{q}_3 < q \): \( \kappa \) is the solution either to \( W_a (\kappa) = W_{aa} (\kappa) \) or \( W_a (\kappa) = W_{ar} (\kappa) \). The first equation is the same as in Case 2. Turn to \( W_a (\kappa) = W_{ar} (\kappa) \) which implies

\[
\left( s - p + \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} (s - \kappa) \right) \cdot (1 + \delta) = \kappa (1 - 2 \lambda \delta + \delta) - p (1 + \delta) + (2s + c) \lambda \delta. \tag{A.8}
\]

Differentiation gives

\[
\left( -dp - \frac{1 - \delta \lambda \alpha}{1 + \delta \lambda \alpha} dk \right) (1 + \delta) = (1 - 2 \lambda \delta + \delta) dk - (1 + \delta) dp
\]

and

\[
\frac{\partial \kappa}{\partial p} = 0.
\]

Since \( \kappa \) depends on \( p \), \( s \) and \( c \) (among other parameters), I will write \( \kappa (p, s; c) \) to empathize the dependence whenever needed. Since the game is location-invariant,

\[
\kappa (p + \eta, s + \eta; c) = \eta + \kappa (p, s; c).
\]

Therefore, letting \( h (z; c) = \kappa (0, -z; c) \) and setting \( p = 0 \) and \( s = -z \) gives

\[
\kappa (\eta, -z + \eta; c) = \eta + h (z; c).
\]

**Lemma A.32** The function \( h \) satisfies the following.

i) \( h (z; c) < -z \),

ii) \( \frac{\partial}{\partial z} h (z; c) \leq -1 \),

iii) \( \frac{\partial}{\partial c} h (z; c) \leq 0 \) and

iv) \( \frac{\partial^2}{\partial c \partial z} h (z; c) = 0 \) whenever \( \frac{\partial^2}{\partial c \partial z} h (z; c) \) is defined.

**Proof.** By Lemma A.28,

\[
\kappa (p, s; c) < s.
\]

This is true for all \( p \) and \( s \),

\[
h (z; c) = \kappa (0, -z; c) < -z
\]

which is i).
Turn to ii). Observe that
\[ h(z; c) = \kappa(0, -z; c) = \kappa(z, 0; c) - z \]
by location-invariance. Since \( \frac{\partial}{\partial p} \kappa(p, s; c) \leq 0 \) by Lemma A.31, differentiating w.r.t. \( z \) gives ii).

The next one, iii), follows since \( h(z; c) = \kappa(0, -z; c) \) is decreasing in \( c \) by Lemma A.30.

Finally, to obtain iv), check equations (A.5)-(A.8). There, put \( p = 0 \) and \( s = -z \). Then, clearly, \( \frac{\partial}{\partial c} h(z; c) \) does not depend on \( z \). ■

Now, prove Proposition 2.5. Consider the restriction of \( X = [X_1, X_2] \). Observe that
\[
D(z; c) = \Pr[\text{delay} \mid p-s = z \text{ or } p-s = -z] \\
= \Pr[p-s = z \mid p-s = z \text{ or } p-s = -z] \cdot \Pr[\text{delay} \mid p-s = z] \\
+ \Pr[p-s = -z \mid p-s = z \text{ or } p-s = -z] \cdot \Pr[\text{delay} \mid p-s = -z] \\
= \frac{1}{2} \Pr[\text{delay} \mid p-s = z] + \frac{1}{2} \Pr[\text{delay} \mid p-s = -z] \\
= \Pr[\text{delay} \mid p-s = z].
\]
Assume that \( z \leq X_2 - X_1 \). Otherwise, \( D(z) \) is not well-defined.

Let \( f(q', s', p') \) be the density at \((q, s, p) = (q', s', p')\). Also, let \( f_p \) be the marginal density for \( p \), and \( f_{s,p} \) be the (joint) density for \( s \) and \( p \). The conditional density of \( q \) and \( p \), conditional on \( p-s = z \), is
\[
f_{q,p}(q', p'\mid p-s = z) = \frac{f(q', p' - z, p')}{\int f_{s,p}(p'' - z, p'') f_p(p'') dp''}
\]
\[
= \frac{1}{X_2 - X_1} I[X_1 \leq q' \leq X_2] \frac{1}{X_2 - X_1 - z} I[X_1 + z \leq p' \leq X_2] \\
\int_{X_1+z}^{X_2} \int_{X_1}^{X_2} ds'' \\
= \frac{1}{X_2 - X_1} I[X_1 \leq q' \leq X_2] \frac{1}{X_2 - X_1 - z} I[X_1 + z \leq p' \leq X_2].
\]

Then,
\[
D(z; c) = \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1}^{X_2} \int_{X_1}^{X_2} I[\kappa(p', z; c) \leq q' \leq p'] dp' dp \\
= \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1}^{X_2} p' - \max\{X_1, \kappa(p', z; c)\} dp' \\
= \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1}^{X_2} p' - \max\{X_1, p' + h(z; c)\} dp'.
\]

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Lemma A.33 \( D(z;c) \) is twice differentiable.

Proof. Since \( h(z;c) \) is twice differentiable for \((z,c)\) (Lebesgue-measure) almost everywhere, \( D(z;c) \) is twice differentiable. \( \blacksquare \)

Lemma A.34 \( \frac{\partial}{\partial z} D(z;c) \geq 0. \)

Proof. Observe that
\[
\frac{\partial}{\partial z} D(z;c) = \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1 + z}^{X_2} p' - \max \{ X_1, p' + h(z;c) \} \, dp' \\
+ \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} (-1) (X_1 + z - \max \{ X_1, X_1 + z + h(z;c) \}) \\
+ \frac{1}{X_2 - X_1} \frac{1}{X_1 + z} \int_{X_1 + z}^{X_2} - \frac{\partial}{\partial z} \max \{ X_1, p' + h(z;c) \} \, dp'.
\]

Since \( z + h(z;c) \leq 0 \) by Lemma A.32-i),
\[
(X_2 - X_1) \frac{1}{X_2 - X_1 - z} \frac{1}{X_2 - X_1} \int_{X_1 + z}^{X_2} p' - \max \{ X_1, p' + h(z;c) \} \, dp' - (X_2 - X_1 - z) z \\
+ \int_{X_1 + z}^{X_2} - \frac{\partial}{\partial z} \max \{ X_1, p' + h(z;c) \} \, dp' = (X_2 - X_1 - z) z.
\]

The last term is non-negative by Lemma A.32-ii). Check the first two terms. Lemma A.32-i) implies
\[
p' + h(z;c) \leq p' - z
\]
and hence if \( X_1 \leq p' - z \),
\[
\max \{ X_1, p' + h(z;c) \} \leq p' - z.
\]

Thus,
\[
\int_{X_1 + z}^{X_2} p' - \max \{ X_1, p' + h(z;c) \} \, dp' \\
\geq \int_{X_1 + z}^{X_2} p' - (p' - z) \, dp' = (X_2 - X_1 - z) z.
\]

Therefore, \( \frac{\partial}{\partial z} D(z;c) \geq 0. \) \( \blacksquare \)
Lemma A.35 \( \frac{\partial}{\partial c} D (z; c) \geq 0 \)

**Proof.** Compute

\[
\frac{\partial}{\partial c} D (z; c) = \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1 + z}^{X_2} \frac{\partial}{\partial c} \max \{ X_1, p' + h (z; c) \} \, dp'.
\]

By Lemma A.32-iii), \( \frac{\partial}{\partial c} D (z; c) \geq 0 \). ■

Lemma A.36 \( \frac{\partial^2}{\partial c \partial z} D (z; c) \leq 0 \).

**Proof.** Compute

\[
\frac{\partial}{\partial c} D (z; c) = \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1 + z}^{X_2} - \frac{\partial}{\partial c} \max \{ X_1, p' + h (z; c) \} \, dp'.
\]

If \( X_1 > X_2 + h (z; c) \), \( \max \{ X_1, p' + h (z; c) \} = X_1 \) for all \( p' \in [X_1 + z, X_2] \) and \( \frac{\partial^2}{\partial c \partial z} D (z; c) = 0 \). Assume \( X_1 \leq X_2 + h (z; c) \). Then,

\[
\frac{\partial}{\partial c} D (z; c) = \frac{1}{X_2 - X_1} \frac{1}{X_2 - X_1 - z} \int_{X_1 + z}^{X_2} - \frac{\partial}{\partial c} h (z; c) \, dp'.
\]

Now,

\[
\frac{\partial^2}{\partial c \partial z} D (z; c) = - \frac{1}{X_2 - X_1} \frac{1}{(X_2 - X_1 - z)^2} \frac{\partial}{\partial c} \left[ h (z; c) \right] - \frac{1}{X_2 - X_1} \frac{1}{(X_2 - X_1 - z)} \frac{\partial}{\partial z} \left[ h (z; c) \right] - \frac{1}{X_2 - X_1} \frac{X_2 - X_1 + h (z; c)}{(X_2 - X_1 - z)} \frac{\partial^2}{\partial c \partial z} h (z; c).
\]

Lemma A.32-iv) gives

\[
(X_2 - X_1) (X_2 - X_1 - z) \frac{\partial^2}{\partial c \partial z} D (z; c) = - \left( \frac{X_2 - X_1 + h (z; c)}{X_2 - X_1 - z} + \frac{\partial}{\partial z} h (z; c) \right) \frac{\partial}{\partial c} h (z; c).
\]
By Lemma A.32-i) and ii),
\[
\frac{X_2 - X_1 + h(z; c)}{X_2 - X_1 - z} + \frac{\partial}{\partial z} h(z; c)
\leq 1 + \frac{\partial}{\partial z} h(z; c) \leq 0,
\]
and, by Lemma A.32-iii), \(\frac{\partial}{\partial c} h(z; c) \leq 0\). Therefore,
\[
\frac{\partial^2}{\partial c \partial z} D(z; c) \leq 0.
\]

**Proof of Proposition 2.6.**
On any equilibrium paths, the nominee may fail to gain confirmation only when
\[
W_{ar}(q) > \max \{W_a(q), W_{aa}(q)\}.
\]
And when this condition is met, the failure happens with probability \(\lambda\). Therefore, I only need to check the set \(F\) of \(q\)’s satisfying (A.9).

When I prove Proposition 2.3-ii) and iii), I have shown that either i) the set \(F\) is empty or ii) \(F\) is an interval. When \(F\) is an interval, the two endpoints \(m_* < m^*\) satisfy
\[
W_{aa}(m_*) = W_{ar}(m_*), m_* \in (\bar{q}_2, \bar{q}_3) \text{ and } W_{aa}(m^*) = W_{ar}(m^*), m^* \in \left[p - \frac{1}{1-\alpha} c, p - c\right].
\]
Since I have closed forms for \(W_{aa}\) and \(W_{ar}\), the two endpoints can be explicitly solved and some computations gives
\[
m_* = s + \frac{1}{2 - \lambda - \alpha \lambda} \{ (1 - \alpha \lambda) c - \lambda (1 - \alpha) (p - s) \} \text{ and } m^* = p - \frac{1 - \alpha \lambda}{\lambda (1 - \alpha)} c.
\]
Thus, the failure happens if and only if \(\min \{X_1, m_*\} < q < m^*\). Observe that both \(m^* - X_1\) and
\[
m^* - m_* = \frac{2}{\lambda (1 - \alpha)} \frac{1 - \alpha \lambda}{2 - \lambda - \alpha \lambda} \{ (1 - \alpha \lambda) (p - s) - (1 - \alpha \lambda) c \}
\]
are increasing in \(p - s\), and decreasing in \(c\).
References


