A Theory of Judicial Retirement

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Draft: June 11, 2014

Abstract

For over 50 years, narrative and empirical accounts of judicial retirement have selected variables on a range of unstated assumptions, with discordant results. This paper introduces a formal model in which the justices, the President and the Senate are rational agents who aim to shift the median ideology of the Court as close as possible to their own ideologies. The model shows that the probability of retirement depends on a set of personal, contextual and political variables. It provides a more rigorous theory for the effect of extant variables, reveals erroneous conclusions in the literature, and identifies variables that have not been previously appreciated, such as the ideologies of the non-retiring justices and whether the ideology of the retiring justice is moderate or extreme. This more complete explanation of strategic judicial retirements raises empirically testable predictions to differentiate among the disparate findings of the existing literature.

(JEL K10, K30, K40)

1. INTRODUCTION

Almost every aspect of judicial behavior has been minutely modeled within the framework of law and economics, from nominations (e.g. Cameron, Cover and Segal 1990; de Figueiredo and Tiller 1996; Black and Boyd 2012) and choice of cases (e.g. Caldeira, Wright and Zorn 1999; Baird 2006; Daugherty and Reingamum 2006), through to final decisions (e.g. Gely and Spiller 1990; Segal, Cameron and Cover 1992; Schwartz 1992; Spiller and Tiller 1996), opinion writing (e.g. Maltzman, Spriggs and Wahlbeck 2000; Vanberg and Staton 2008; Owens and Wedeking 2011) and coalition formation (e.g. Cross and Tiller 1998; Jacobi 2009; Fischman 2011). Yet

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there has been no law and economics model of the decision process of justices facing retirement.¹ However, without understanding the endgame, the rest of the strategic judicial enterprise cannot be fully comprehended. This paper provides a simple theoretical model of judicial retirement. It shows that despite developing a number of important contributions to this area of knowledge, the existing literature analyzing judicial retirement – comprised largely of empirical political science accounts – contains some dubious claims and fails to account for a number of significant variables.

The strategic judicial behavior literature expects that rational justices should tailor their retirements to political cycles, so as to coincide with presidential administrations of similar political leanings. In this paper, we show that, although that conclusion has merit, the motivations for strategic retirement extend well beyond the ideology of the President, and furthermore, that there will be many situations in which even when the ideologies of the retiring justice and the President are aligned, the justice will have a very low probability of retiring.

Other factors that are significant include the relative ideological position of the Senate. As Moraski and Shipan (1999) showed, the President can only impose his ideally preferred nominee under certain political configurations; often, the ideology of the Senate constitutes a meaningful constraint on presidential choice. In addition, the relative ideological positions of the median of the Court and the potentially retiring justice – whether the retiree is moderate or extreme relative to the median – are also important.

Our model shows that the retirement decision depends in part on the probability of what we call “forced retirement” – the possibility of an exit being driven by exogenous factors, such as age, death or ill health. But the effect of these exogenous factors is not linear, as the literature

¹ We have a model of signaling by a justice who has already decided to retire, see Bustos and Jacobi (2014b), however there is no model of the more fundamental strategic question of when a justice will retire.
sometimes assumes. Rather, the choice of retirement depends on whether the future forced retirement probability is larger than a certain threshold, T, a ratio of the ideological distance between the current median of the Court and the median of the Court if the justice retires in the first period, over the distance between the current median and the expected median of the Court if the justice retires in the next period. From this relationship, numerous conclusions follow.

For instance, if the retiring justice is the median, somewhat older (and thus anticipating the possibility of forced retirement) and the ideological array of the nominating agents is such that her expected replacement would also be at the Court’s median, then the justice will choose to retire with certainty. This is because the expected position of her replacement will be her ideological brethren, whereas if the justice does not retire in this period, in the future she may be forced to retire with some positive probability, and the political configuration may be less friendly. In contrast, if the moderate justice expects the political alignment to be such that she would be replaced by a like-minded nominee in the next period, she will never retire in the first period.\footnote{Indeed we show that if the game played by the retiring justice has finite periods, she always chooses not to retire in the last period, since the optimal replacement nominee can at best have exactly the same ideology as the retiring justice. That underlying motivation for a justice to stay on the Court has important implications, discussed below.} Probabilistic variations also arise.

The failure to appreciate these additional factors and their interplay with the already recognized political variables makes the existing literature on judicial retirement quite incomplete. This is particularly true in the law and economics literature, where judicial retirement has received surprisingly little attention. Yet this topic is centrally important to the law and economics understanding of judicial behavior, for without understanding when justices will withdraw from the Court, it is impossible to engage in accurate backwards induction, to understand the myriad other strategic decisions that justices must make. As Zorn and Van Winkle (2000: 160) note: “Any change in the Supreme Court’s personnel first requires that a seat
on the bench be vacated. For this reason, it is important to understand the dynamics of vacancies on the high bench as predicate to any examination of nominations, confirmations, and judicial behavior on the Court in general.”

Simultaneously, the topic of judicial retirement would benefit from a law and economics analysis, as the somewhat myopic focus on presidential administrations in the political science literature illustrates. In particular, the highly contradictory empirical findings that have resulted from informal models suggest that a formal model would be significantly helpful. We draw five empirically testable hypotheses from our model and show how these could be used to clarify the confusion in the literature.

Part 2 reviews the existing literature. Part 3 sets up the model. Part 4 provides the solution. Part 5 sets out the results and draws testable hypotheses. Part 6 provides discussion of possible extensions and the effect of relaxing some of our assumptions, and Part 7 concludes.

2. LITERATURE REVIEW

Even early narrative biographical accounts of judicial retirement that arose before the development of any significant judicial strategy literature recognized the strategic attempts of justices to structure their retirement around the ideology of their expected replacement. For instance, Schmidhauser (1962:122), in attempting to generalize the reasons behind appointments and retirements through a biographical account of 92 early Supreme Court justices, found that most Supreme Court justices were determined to remain on the Court until a friendly administration would determine their replacements. The goal of ideological legacy has apparently long been enough to overcome the desire for work minimization, as Schmidhauser described how even those whose physical and mental fatigue were readily apparent “were so
strongly motivated with respect to the ideological significance of their post that they willingly remained in the bench despite its obvious burdens” (127).

Yet surprisingly, the political science literature on judicial retirement that followed did not take this lead and develop a theoretical model of this intuited judicial retirement strategy; rather, a largely empirical literature developed. However, statistical analysis of both Supreme Court and lower court departures has not provided a satisfactory explanation of judicial retirement decisions. As Stolzenberg and Lindgren (2010) describe, scholars have disagreed vehemently on methodology, and results have varied widely in terms of their substantive conclusions.

A central question is whether political variables are significant. Some earlier studies questioned the impact of political effects on judicial retirement (e.g. Squire 1988), but others found clear evidence of the “politicized departure hypothesis” (e.g. King 1987). At the Supreme Court level, Brenner (1999), Squire (1988), and Yoon (2006) found no evidence of a pattern of politicized departure of justices, but Hagle (1993) and King (1987) found political effects on departures from the Court. Further, Box-Steffensmeier and Zorn (1998) and Zorn and Van Winkle (2000) reported some analyses that are consistent and some that are not consistent with the politicized departure hypothesis. In studies of the lower federal courts, results have been more consistent. Barrow, Gryski, and Zuk (1996), Barrow and Zuk (1990), Nixon and Haskin (2000), Spriggs and Wahlbeck (1995) and others examining departures from federal district and appellate courts all found evidence that political factors are significant. However, Nixon and Haskin conclude that non-political considerations are dominant, whereas Barrow and Zuk, conclude that judicial retirement is strongly influenced by political considerations and “infused with partisanship.” Spriggs and Wahlbeck show that the political effect is complex: they find a clear effect for judges retiring under friendly regimes, but also find that retirements occur at
higher rates when unfriendly political conditions seem unlikely to change.

Some clarity has been brought more recently to the political effects question: one of the most comprehensive studies, using more contemporary approaches, found overwhelmingly that political factors are highly significant. Stolzenberg and Lindgren (2010) examined the determinants of justices exiting the Court from both mortality and retirement, estimating the effects of age, vitality, job tenure, and pension benefit eligibility on retirement. They found that all four factors significantly increase the probability of retirement, as we should expect from rational agents: “if the incumbent president is of the same party as the president who nominated the justice to the Court, and if the incumbent president is in the first two years of a four-year presidential term, then the justice has odds of resignation that are about 2.6 times higher than when these two conditions are not met. In addition… [w]hen the incumbent president is of a different party than the president who appointed the justice, then the justice’s death-in-office odds are about tripled, compared with when the appointing president and the incumbent president are members of the same party.” (291).

These stark findings are consistent with the central logic of the rational agent model, which predicts that justices will consider political factors in the retirement decision. But there is no reason to assume these effects are mutually exclusive of other considerations, such as elements promoting forced retirements and the relative ideological positions of the justices on the current and future possible Court, which our model considers. In short, there is much research on the politicized departure hypothesis, with most studies finding a political effect on judicial retirements, but the nature of the relationship remains ambiguous.

A further problem with the analysis of judicial retirement strategy being empirically-driven rather than theoretically-driven is that it results in the development of an ad hoc set of
hypotheses. For instance, Hagle (1993) was central in developing the strategic model, but tested hypotheses without a clear theory and without ascertaining whether alternative theories may have more explanatory power. Hagle differentiated between each year of a president’s term, theorizing that strategic retirement is more likely to take place during the first years of the term, as a justice may have been waiting to retire during the previous administration, and adopt a ‘wait and see’ attitude in the latter years. This may be correct but is hardly a robust model. And Hagle also used a dummy variable of whether the justice was over 80 (as well as a mean age of the court variable), which is a somewhat arbitrary figure. We find that there will be a different threshold for each justice, depending on factors such as their own relative ideological extremity, which allows greater precision and reveals other interactive effects. In fact, despite the centrality of the concept of relative ideological positioning to political science models, there is little mention of the effect of whether a justice is positioned extremely or moderately when assessing justices’ retirement strategies.

The most common approach in subsequent analysis has been to include additional variables in the empirical inquiry, but this has failed to provide additional clarity, instead contributing yet more results to a literature that is highly at odds with itself. For instance, Zorn and Van Winkle (2000) analyze three potential reasons for justices to leave the Court: personal considerations of the type previously considered, including age and eligibility for pension benefits; institutional considerations, including the justices’ number of opinions, as a proxy for work engagement; and political factors, including once again the stage of the presidential term, and what they call “critical nominations,” a kind of proxy for being pivotal. They find evidence of more retirements occurring at the beginning of the president’s second term, but find weak evidence on retirements being driven by political factors – but the only reason for including timing within an
administration’s term was as an extension of the political effect, so this result only further confuses the issue.

One of the few results that the empirical literature agrees on is that the elements that feed into what we call forced retirement are consistently relevant. For instance, Cameron, Cover and Segal (1990) suggest that age is the main indicator of retirement, although they assume the impact of age to be linear, without any theoretical basis, or considering any threshold effect, such as appears in our model. In our model, the impact of age on retirement decisions is completely determined by its capacity to shape the expected probability of forced retirement in the future (the next period). Although we should expect that the probability of forced retirement will increase with age, we cannot rule out situations in which the effect will be the opposite (for example in certain periods health may improve over time). We also discuss a form designed to isolate the effect of pension eligibility in the retirement decisions.

Despite the centrality of the effect of potential vacancies on judicial behavior, there is disarray in the judicial retirement literature. Although a formal model may not comprehensively resolve all of these disputes, the contradictory results arising from existing informal analysis indicates, at the very least, that there is some benefit to be gained from developing greater theoretical scaffolding for this inquiry.

3. THE MODEL

3.1 Players

Suppose that the Court has three Justices, \( \{J_1, J_2, J_3\} \), and operates for two periods \( t \in \{1, 2\} \). We assume that justice \( J_r \) (“r” for retiring) is considering retirement at the beginning of the first period. The other justices do not retire — in Section 6.1 we discuss the possibility of multiple potentially retiring justices. If \( J_r \) does not retire during the first period, then she faces probability
of involuntary retirement at the beginning of the second period due to exogenous reasons (e.g. health issues). If J, does not retire due to exogenous factors, then she faces a second and final opportunity to freely choose retirement.\(^3\)

Whenever a justice dies or retires, the President, P, and the Senate, S, play a one-period game, as in Moraski and Shipan (1999, hereinafter ‘MS’), to fill the vacancy. That is, P proposes a candidate and S confirms or rejects the nominee. If S confirms, the nominee becomes the new justice; if S rejects, then the seat remains vacant and the Court keeps the default median, constituted by the mid-point of the two remaining justices.

In order to incorporate the concept of a change of a political cycle, we consider that in period 1 the President and the Senate are \(P_1\) and \(S_1\) but in period 2 the President and the Senate are \(P_2\) and \(S_2\).

### 3.2 Players’ Preferences and Payoffs

Justice \(J_g\) has ideology \(\alpha_g \in [0,1]\). The closer \(\alpha_g\) is to 1, the more conservative the justice is. In order to identify a liberal, a moderate and a conservative justice, we consider that \(0 < \alpha_1 < \alpha_2 < \alpha_3 < 1\). That is, \(J_1\) is the liberal justice, \(J_2\) is the moderate justice and \(J_3\) is the conservative justice. All justices’ ideologies are known.\(^4\) In addition we denote the ideology of \(P_t\) as \(\alpha_{P_t} \in [0,1]\) and the ideology of the \(S_t\) as \(\alpha_{S_t} \in [0,1]\). While \(\alpha_{P_1}\) and \(\alpha_{S_1}\) are known, the values of \(\alpha_{P_2}\) and \(\alpha_{S_2}\) are distributed according to density functions \(f(x)\) and \(g(x)\) respectively in which \(F(\alpha) = \int_0^\alpha f(x)dx\) and \(G(\alpha) = \int_0^\alpha g(x)dx\). We do not impose restrictions on the values of \(\alpha_{P_1}\) and

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\(^3\) We do not consider the probability that \(J_1\) may have to retire for exogenous reasons at the beginning of the first period because in that case the Justice does not face a retirement decision in the first and/or second periods anymore.

\(^4\) That would be the case as long as the justices have been with the Court long enough (see Bustos and Jacobi 2014a).
\( \alpha_s \), or in their relative position. At this point we introduce an important assumption; we address the effect of relaxing this assumption in Section 6.2.

**Assumption 1:** Ideologies of the President and Senate in the second political cycle are independent of the ideologies of the President and Senate in the first political cycle.

The only agents that make decisions are: \( J_r, P_t \) and \( S_t \). For all players, we assume that their goal is to minimize the distance between their own ideologies and the expected median of the Court. We assume that \( P_t \) and \( S_t \) are myopic, whereas \( J_r \) cares about the long term median of the Court. There are just three possible scenarios for the long-term median. First, if \( J_r \) does not retire in period 1 or period 2, the median remains at \( \alpha_s \). If \( J_r \) retires in period 1, the median becomes \( m_r \) and if she retires at period 2, the median becomes \( M_r \). Both \( m_r \) and \( M_r \) will be estimated in the solution of the model. Two ideas are implicit in these three scenarios: first, the discount factor is 1, and second, the retiring justice cares about the long term median of the Court.

### 3.3 Timing of Actions

Figure 1 summarizes the sequence of events and decisions described above.

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5 That means that the President can be more liberal than the Senate, or vice versa.

6 Without this assumption, the probability distribution of the ideologies of \( P_2 \) and \( S_2 \) will be conditional on \( P_1 \) and \( S_1 \).

7 Presidents most obviously have short-term horizons, being limited to two four year terms (or 2.5 terms if a Vice President is promoted during a presidential term). As of the 111th Congress, Senators serve on average 12.3 years (Glassman and Hemlin 2010: 8), whereas as of 2006, Supreme Court justices serve for an average of 26.1 years (Calabresi and Lindgren 2006: 778). In Section 6.2 we relax this assumption.
3.4 Nomination Games

Because it will clarify the rest of the paper, here we explain the logic of the MS nomination games played by P and S when a Court vacancy occurs at the end of the first period. Without loss of generality, we assume that J₃ is the retiring justice and αₚ₁ < α₁.\(^8\)

**P and S have opposed ideologies (‘FC’ for fully constrained):** If αₚ₁ < (α₁ + α₂)/2 < αₛᵢ, the President nominates a new justice with ideology (α₁ + α₂)/2 and he is confirmed by the Senate. Even when the President would like to nominate a new justice more liberal than J₃, so that J₁ becomes the new median, any justice with ideology farther left than (α₁ + α₂)/2 will be rejected by the Senate, since that is the default option in case of no agreement.

**P and S have semi-opposed ideologies (‘SC’ for semi-constrained):** If αₚ₁ < (3α₁ + α₂)/4 < αₛᵢ < (α₁ + α₂)/2, the President nominates a new justice with ideology 2αₛᵢ − (α₁ + α₂)/2 and he is confirmed by the Senate. Again the President would like to appoint a new justice who is more liberal, but any nominee whose ideology lies at a distance from the Senate’s ideology larger than the distance of the Senate’s ideology from the default median will be rejected by the Senate. Then if we denote the ideology of the new nominee as αₙ, the Senate will reject any nominee where αₙ − αₛᵢ > αₛᵢ − (α₁ + α₂)/2. In other words, the most liberal new nominee that the Senate is willing to confirm is αₙ = 2αₛᵢ − (α₁ + α₂)/2.

**P and S have aligned ideologies (‘UC’ for unconstrained):** If \(\max\{\alpha_{p₁}, \alpha_{s₁}\} < (3\alpha₁ + \alpha₂)/4\), the President is free to nominate a new justice with ideology αₚ₁, who will be confirmed by the Senate because then the new median of the Court is α₁. The Senate prefers α₁ to (α₁ + α₂)/2.

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\(^8\) The analysis of all the other cases is analogous. In the proof of Proposition 1 we cover all of them.
4. SOLUTION OF THE MODEL

In this section we characterize $J_r$’s optimal retiring strategy. First, it is clear that she never retires during the second period. The reason is that regardless of whether she is a moderate or an extreme justice (liberal or conservative), if she retires she leaves the Court with a median at best in the same position as if she does not retire, and in the most likely case she leaves the Court further away from her ideology.\(^9\)

The characterization of the retirement strategy at the beginning of the first period requires a distinction in the ideology of the retiring justice. We focus in the cases in which $J_r$ is the conservative or the moderate justice. We do not discuss the liberal case because its analysis is analogous to the conservative case.

The retiring Justice is Conservative ($r = 3$)

A conservative justice prefers to retire at $t = 1$ if the following inequality holds:

$$\alpha_3 - m_3 < \alpha_3 - (\alpha_2 + pM_s)$$  \hspace{1cm} (1)

The left hand side of (1) tells us that if $J_r$ retires in the first period then the Court will be left with a median equal to $m_3$. As is shown in figure 2, the values of $m_3$ depend on the ideologies of $P_1$ and $S_1$. For example, if both the President and the Senate are conservative enough ($\alpha_{P_1} > \alpha_2$ and $\alpha_{S_1} > (\alpha_4 + 3\alpha_2)/4$) then $m_3 = \alpha_2$ but if both are liberal enough ($\alpha_{P_1} < \alpha_1$ and $\alpha_{S_1} < \alpha_1$) then $m_3 = \alpha_1$.\(^{10}\)

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\(^9\) To be more specific, if she is the moderate justice then her ideology is the median of the Court, hence a new median of the Court can never be closer to her own ideology (the best that can happen is that the new median will be $(\alpha_1 + \alpha_3)/2 = \alpha_2$, but that is a particular case). If the new justice is extreme, for example conservative, then the new median of the Court will be a value within the interval $[\alpha_1, \alpha_2]$ which cannot be closer to $\alpha_3$ than $\alpha_2$. In Section 6.4 we show that even in a model with more than two periods, it is enough to show that $J_r$ prefers not to retire in the period after the first period (or the current period). This follows from Assumption 1.

\(^{10}\) Applying the logic explained in Section 3.4.
In addition, the right hand side of (1) tells us that in the second period the justice faces the possibility of a forced retirement (probability $p$). In that case the median of the Court will be $M_3$; this is an expected value that is conditional on the expected ideologies of the President and the Senate in the second period as well. In the appendix we determine the exact value of $M_3$; for now we continue our analysis keeping in mind that $M_3 \in [\alpha_1, \alpha_2]$. Given that we know that $J_3$ does not freely retire in the second period, in case of no forced retirement (probability $1 - p$), the median of the Court remains as $\alpha_2$.

With all these considerations in mind, we determine that a conservative justice retires at the beginning of the first period if and only if

$$p > \frac{\alpha_2 - m_3}{\alpha_2 - M_3}$$

From figure 2 we know that $m_3$ can have five different values which themselves define five possible values of $p$ that range from 0 to 1 — we are treating any value of $p$ larger than 1 as 1.

**The retiring Justice is Moderate ($r = 2$)**

Following the same steps from the conservative case, it follows that justice $r$ prefers to retire at $t = 1$ if the following inequality holds:

$$|\alpha_2 - m_2| < |\alpha_2 - ((1 - p)\alpha_2 + pM_2)|$$

Figure 3 shows the possible values of $m_2$
As in (1), inequality (2) tells us that in the second period the justice faces the possibility of a forced retirement, in which case the median of the Court will be $M_2$. Also in the appendix we determine the exact value of $M_2$ and show that $M_2 \in [\alpha_t, \alpha_3]$. Hence it follows that a moderate justice retires at the beginning of the first period if and only if

$$p > \bar{p} = \frac{\alpha_2 - m_2}{\alpha_2 - M_2}$$

Although it is still the case that the values of $\bar{p}$ can range from 0 to 1, the conditions in which $\bar{p} = 0$ or $\bar{p} = 1$ occur are very different in the scenario where the retiring justice is the conservative justice than when she is the moderate justice. We leave that discussion for the next section. We end this one by summarizing the properties of the solution in proposition 1.

**Proposition 1 (Retirement Strategy):** If the retiring justice is $J$, then she retires at the beginning of the first period if and only if her exogenous probability of retirement is larger than

$$\bar{p} = \frac{\alpha_2 - m_3}{\alpha_2 - M_3}$$

In which the value of $m_2$ and $m_3$ are conditional on $P_1$ and $S_1$ and are defined by figures 2 and 3 respectively and the values of $M_2$ and $M_3$ are conditional on the expected values of $P_2$ and $S_2$ and are calculated in the Appendix.

**Proof:** See the Appendix.

In order to facilitate the discussion of the results in the next section, figures 4 and 5 summarize possible values of $\bar{p}$ in the plane $(\alpha_t, \alpha_3)$. 
5. RESULTS

In this section we present our main results. We show that the retirement decision of a justice is shaped by five elements. First and centrally, the decision depends on the current ideologies of the President and the Senate; we show that accounting for only one political player is not enough, both have to be considered. Second, there are important differences between the retirement decisions made by extreme and moderate justices. Third, the ideologies of the non-retiring justices affect the likelihood with which the retiring justice is replaced with a like justice, and ergo they affect the incentives of the retiring justice to make that decision. Fourth, a necessary condition for retirement to take place is that the probability of an exogenous retirement must be strictly positive. Although in some circumstances retirement never takes place for all values of that probability of forced retirement, when the probability is 0, then justices always prefer not to retire, for all types of justices. Fifth, variations in the expected ideologies of the President and the Senate in the new political cycle affect retirement decisions. As well as illustrating the effect of these variables, we draw testable hypothesis from our results that we contrast to the results that the literature has already obtained.

5.1 Current Ideologies of the President and the Senate

Our model predicts that retirement decisions depend on the ideology of the President and the Senate. It is not enough to consider only the ideology of one of them. For example, we know that when J₃ is considering retirement, he retires with certainty if both P₁ and S₁ are conservative enough (\(\alpha_{R} \) is beyond \(\alpha_{2} \) and \(\alpha_{S₁} \) is beyond \((\alpha_{1} + 3\alpha_{2})/4\)) but if \(\alpha_{R} > \alpha_{2}\)
and $\alpha_{S_i} < (\alpha_1 + 3\alpha_2)/4$ then the retiring justice will retire if and only if the probability with which she expects to retire due to exogenous reasons is large enough. In the same way, $J_3$ will never retire if both $P_1$ and $S_1$ are liberal enough ($\alpha_{P_1}$ is less than $\alpha_1$ and $\alpha_{S_1}$ is less than $(3\alpha_1 + \alpha_2)/4$), but if $\alpha_{S_1} > (3\alpha_1 + \alpha_2)/4$ then the justice may retire if the value of $p$ is large enough.

In addition, the model tells us that for a given ideology of the Senate, the closer the ideology of the President is to the ideology of the retiring justice, the higher is the probability that the retiring justice actually retires (the smaller the value of $\bar{p}$). In order to see that, consider for example in figure 5 when $\alpha_{S_i} > (\alpha_1 + 3\alpha_3)/4$. In that case, the ideology of the President can be smaller or larger than $\alpha_2$ but the closer $\alpha_{P_i}$ is to that value, the closer $\bar{p}$ is to $0$.

5.2 Ideology of the Retiring Justice

Comparing figures 4 and 5, which determine the threshold values of the exogenous probability of forced retirement that trigger retirement, it is clear that there are many similarities but also many differences between the decisions made by a retiring justice with an extreme or a moderate ideology.

In terms of similarities, an inspection of figures 4 and 5 shows that in both cases $\bar{p}$ can take values that range from 0 to 1. Those values occur for different ideologies of the President and the Senate but any value in the interval [0,1] is feasible regardless whether the retiring justice is moderate or extreme. In addition, whether we are dealing with an extreme or a moderate justice, in both cases the probability of retirement goes down the closer $m_r$ is to $M_r$. That is, the closer are the expected ideologies of the medians of the Court in the current and new political cycles,

\[\text{Notice that when } \alpha_{P_i} \in [\alpha_1 + \alpha_3]/2, \alpha_2], \text{ the value of } \bar{p} \text{ is decreasing with } \alpha_{P_i}, \text{ but when } \alpha_{P_i} \in [\alpha_2, \alpha_3], \text{ the value of } \bar{p} \text{ is increasing with } \alpha_{P_i}. \text{ In particular, when } \alpha_{P_i} = \alpha_2, \text{ then } \bar{p} = 0.\]
the more likely that the justice will decide not to retire (the closer $\overline{p}$ is to 1). Also, the closer $m_r$ is to $\alpha_r$, the more likely it is that retirement takes place (the closer is $\overline{p}$ is to 0). On the other hand, the closer $M_r$ is to $\alpha_r$ the less likely it is that retirement takes place. All this is true regardless whether we are talking about the extreme or the moderate justice.

But retirement with certainty is more likely for extreme justices than moderate ones. To see this, notice that conservative justices always retire (regardless of the value of $\overline{p}$) if the President and the Senate are conservative enough.\(^1\) In contrast, for a moderate justice, retirement with certainty only occurs in three particular cases (ergo with very low probability).\(^2\) In the same vein, no retirement is a likely outcome for extreme justices, whereas for moderate justices that outcome fundamentally depends on $M_2$. These two observations imply that, when we condition for the current ideology of $P$ and $S$, there is much more variability in extreme justices’ retirement decisions than in the same decisions for moderate justices. That is, we should observe that extreme justices often retire when $P$ and $S$ have extreme ideologies of the same persuasion but extreme justices do not retire when $P$ and $S$ have extreme ideologies of opposite type. In contrast, we should observe that moderate justices retire when $P$ and $S$ have all sorts of ideologies, although more frequently when their ideologies are closer to the ideology of the justice.

### 5.3 Ideologies of the non-retiring justices

If the conservative justice is considering retirement, then the more skewed to the left the rest of the Court is (the smaller are the values of $\alpha_1$ and $\alpha_2$) then the larger is the set of ideologies of the President and the Senate for which $J_3$ will decide to retire with certainty (the size of the area

\[^{12}\] The same analogous result is true for the liberal justice.

\[^{13}\] The three particular cases are: 1) when $\alpha_p = \alpha_2$ and $\alpha_S > \alpha_2$; 2) when $\alpha_S = (\alpha_2 + (\alpha_1 + \alpha_3)/2)/2$ and $\alpha_p > \alpha_S$ — in which we are considering the case that $\alpha_2 > (\alpha_1 + \alpha_3)/2$; 3) when $\alpha_2 = (\alpha_1 + \alpha_3)/2$ and $\alpha_S > (\alpha_1 + \alpha_3)/2 > \alpha_p$ or when $\alpha_2 = (\alpha_1 + \alpha_3)/2$ and $\alpha_p > (\alpha_1 + \alpha_3)/2 > \alpha_S$. 
(1 − α₂)(1 − (α₁ + 3α₂)/4) obviously gets larger when α₁ or α₂ get smaller). The intuition is straightforward. The more liberal the Court is, the more likely it is that a conservative justice will be replaced by a justice whose ideology is closer to what used to be the median of the Court. The same is not true when the moderate justice is considering retirement. The number of scenarios in which J₂ decides to retire with certainty changes very little if the Court is more skewed to the right or to the left, as long as the moderate justice has the same ideology α₂ within the distribution of ideologies in the Court.. The reason is that a condition for J₂ to retire with certainty is that either the President or the Senate must have the same ideology as the moderate justice and that does not depend on the ideology of the rest of the members of the Court.

On this same logic, if α₁ is very close to α₂, the President and Senate tend not to play a nomination game in which the new nominee and median of the Court is αₚ. Then, the conservative justice tends to retire with certainty very frequently (in figure 4, when \( \bar{p} = (α₂ - α₁)/2(α₂ - M₁) \) then it becomes 0). The analogous result when the retiring justice is moderate takes place only when \( (α₁ + α₃)/2 = α₂ \). That is, again, it is less likely.

5.4 Probability of a forced retirement

Our model generates four clean predictions relating to parameter p (the exogenous probability of retirement).

First, if for any reason a justice approximates\(^{14}\) her perceived probability of exogenous retirement is 0, then that justice never retires. This does not depend on her ideology, the ideology of the rest of the members of the Court, or the current or the expected ideologies of the President.

\(^{14}\)Kahneman and Tversky (1982) show that, when making decisions under uncertainty, human beings do not look for exact solutions in a maximization problem but instead they use heuristics – approximated solutions. They document at least three of these heuristics: representivity, availability, and anchorage. Within their experiments, one of the most well documented behaviors that support their theory is that when faced with unpleasant events, such as accidents, illness or death, people tend to overtly underestimate the probability that such event will happen to them, in many times acting as if that probability was 0.
or the Senate. In other words, whenever justices, either because of age or overconfidence, believe that their forced probability of retirement is practically zero, they will always decide to stay in service, regardless what their true probability of retirement and what the apparent political convenience of their retirement are.

Second, the probability of voluntary retirement increases with age because we should expect that the perceived probability of exogenous/forced retirement associated with health issues goes up. In terms of our model, with age it becomes more likely that the threshold imposed by parameter $p$ will be satisfied.

Third, without contradicting the previous point, the impact of age will be different for justices of different ideologies and justices who face presidents and/or senates of different ideologies. In other words, if we do a cross sectional analysis of justices’ retirement decisions at a common age, we should observe variability in the outcomes.

Fourth and finally, consistent with what has been recognized by the literature (Stoltzenberg and Lindgren, 2010), since retirement decisions take place if and only if the perceived probability of exogenous retirement is large enough, in many cases justices will “die unintentionally” – that is, they will play with the odds of being able to voluntarily determine their own retirement, but many times they will lose that gamble.

5.5 Future expected ideologies of the President and the Senate

The closer is the expected ideology ($M_r$) to the current ideology of the Court ($\alpha_2$), the more likely it is that the justice will decide not to retire during the first period ($\overline{p}$ is increasing). This is true regardless whether the retiring justice has an extreme or moderate ideology.

---

15 This result derives from the fact that in general justices see permanence on the Court as a dominant strategy over retirement. That logic becomes very clear when we analyze the decision of the justice in the second period and that logic holds in the context of a model with more than two periods (see section 6.4).
The results found in subsections 5.1 to 5.5 are summarized in the next Proposition

Proposition 2 (Main results):

i. If the retiring justice is the conservative justice then she retires with certainty if
\[ \alpha_{R_1} > \alpha_2 \text{ and } \alpha_{S_1} > (\alpha_1 + 3\alpha_2)/4 \] but with certainty she does not retire if \( \alpha_{R_1} < \alpha_1 \) and
\[ \alpha_{S_1} < (3\alpha_1 + \alpha_2)/4. \]

ii. If the retiring justice is the moderate justice then, for any expected ideology of the President and the Senate in the next political cycle, she retires with certainty if
\[ \alpha_{R_1} = \alpha_2 \text{ and } \alpha_{S_1} > \alpha_2 \text{ or } \alpha_{S_1} = (\alpha_2 + (\alpha_1 + \alpha_3)/2)/2 \] and
\[ \alpha_{R_1} > (\alpha_2 + (\alpha_1 + \alpha_3)/2)/2. \]

iii. If the retiring justice is the conservative justice then the more skewed the distribution of ideologies of the non-retiring justices is to the left (right), the more (less) likely it is that the retiring justice will retire.

iv. For all retiring justices, the closer \( m_1 \) is to \( \alpha \), the more likely it is that the justice will retire, but the closer \( M_1 \) is to \( \alpha \), the less likely it is that the justice will retire.

v. Variance in retirements with respect to the ideologies of \( P_1 \) and \( S_1 \) is larger for an extreme justice than for a moderate justice.

vi. No voluntary retirement takes place if \( p = 0 \). Ceteris paribus, there exist values of \( p \) that induce the conservative justice to retire but the moderate justice not to retire. There also exist values of \( p \) that induce the moderate justice to retire but the conservative justice not to retire.

Proof: See the Appendix.
In the next subsection we draw both testable implications from the results of proposition 2 and also compare our findings to what the existing literature has found.

5.6 Testable Predictions

TP1 (Ideology alignment): Retiring justices tend to voluntarily retire much more when both the President and the Senate have similar ideologies to them. That is true both for extreme and for moderate justices.

TP2 (Other justices’ ideologies): In the case of a conservative justice, the more skewed to the left is the distribution of ideologies of the rest of the justices, the more likely it is that retirement takes place.

TP3 (Retirement variability): We should observe much more variability (with respect to the ideologies of P and S) in voluntary retirement decisions made by extreme justices than retirement decisions made by moderate justices.

TP4 (P and S inter-temporal ideology variability): Voluntary retirements tend to occur less frequently when the ideologies of P and S change less over time.

TP5 (Justice age): Voluntary retirement will go up with age, however, due to involuntary retirement, the monotonic relation may not hold for very advanced ages.

Table 1 contrasts our predictions to what the literature has found.

<table>
<thead>
<tr>
<th>Prediction</th>
<th>Has it been tested?</th>
<th>Supporters</th>
<th>Detractors</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP1</td>
<td>Partially&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Cameron et al, Ulmer, King, Hagle, Epstein et al, Stolzenberg</td>
<td>Squire, Brennan, Zorn and Van Winkle</td>
<td>Although many authors test the role of political factors, the majority focuses</td>
</tr>
</tbody>
</table>

<sup>16</sup> We consider that authors who have suggested or shown evidence on political variables playing a role in retirement as supporting this proposition.
6. DISCUSSION OF THE MODEL

6.1 When more than one justice retires

The model is flexible enough to consider retirement decisions in cases in which more than one justice is of retirement age. For example, consider that if in the second period the retiring justice does not retire, then there still exists a probability $p'$ that the other original potentially retiring justice will retire. Under those conditions, our model predicts that the probability of retirement goes up with the probability of the other original justices’ forced retirement probabilities; but this occurs if and only if the ideology of $J_r$ is closer to the expected median of the Court when she retires in this period than if she retires in the next period.

In order to see that, notice that with the possibility of $J_2$’s unforced retirement (1) becomes

$$\alpha_3 - m_3 < \alpha_3 - ((1 - p)(p \alpha_2 + (1 - p)M_2) + pM_3).$$

Then if we consider that

---

17 We consider authors who have suggested that justices tend to retire during Presidents second terms as supporting this proposition.
18 For supporters we consider authors who postulate something more elaborated than: “probability of retirement goes up with age”.

\( M_2 > \max\{ m_3, M_3 \} \), the new value of \( p \) is given by

\[
\frac{p M_2 + (1-p') \alpha_2 - m_3}{p M_2 + (1-p') \alpha_2 - M_3}
\]

which is decreasing in \( p' \) when \( M_3 < m_3 \) but is increasing in the same probability otherwise.

Hence, if the conservative justice expects that the Court will be more conservative if she retires in the current period than in the next period, and she knows that the moderate justice might retire in the next period, then she will be more inclined to retire in the current period. This is because if she waits for the next period, the median of the Court can move to the left, not only because of the possibility of her own retirement but because of the possible retirement of the moderate justice.\(^{19}\)

6.2 Correlation between political cycles

Since 1896, there have been 29 presidential terms but only 19 different presidents occupying the office.\(^{20}\) Also, although political ideology has switched from Republican to Democrat and vice versa 11 times during the last 120 years, only in one case (Jimmy Carter, President between 1976 and 1980, who was preceded and succeeded by a Republican) was the presidency not held by the same party for at least for 8 years. In the Senate, historical electoral patterns have displayed “a ‘stickiness’ in party allegiances [that] implies that the dynamic adjustment patterns over time will be disjoint[ed] and episodic,” the broad patterns of which are largely captured by four electoral realignments (Jones, Chang-Jin Kim & Richard Startz 2010: 272).\(^{21}\) These statistics suggest that the assumption that the political ideologies of the President and the Senate in subsequent cycles are independent may be too strong. However, as we show next, our results

\(^{19}\) Notice that any potential retirement of the moderate justice during the first period is not relevant for us as the conservative justice’s retirement decision is made after that.

\(^{20}\) Which gives an average of 1.5 terms per president.

\(^{21}\) “A Republican regime dominated from 1914 through 1928; a Democratic regime characterized the period 1930–1934, and a Democratic-leaning regime characterized the period 1938 to the present (1936 is a transition year)” (Jones, Chang-Jin Kim & Richard Startz 2010: 254).
are still valid if we add some degree of correlation between ideologies in the different cycles. What is different is that we are able to make more specific predictions.

There are many ways in which correlation in political affiliations between two subsequent cycles can be introduced to our model but we discuss the simplest option.\textsuperscript{22} Suppose that $m_3$ and $M_3$ can be written as

$$m_3 = \mu \alpha_1 + (1 - \mu) \alpha_2$$

and

$$M_3 = \delta \mu \alpha_1 + (1 - \delta \mu) \alpha_2$$

in which $\mu \in [0,1]$ captures the degree in which the new median of the Court in case of a first period retirement leans towards the left and $\delta \in [0,1/\mu]$ captures the correlation between $m_3$ and $M_3$. Evidently the same considerations that lead us to derive (1), and ergo proposition 1, are true here. But now we are able to derive a simpler expression for $\overline{p}$. More specifically, the conservative justice will retire in the first period if and only if $\overline{p} > 1/\delta$. Three points follow from that last condition. First, the probability of retirement is bounded from above, that is, in all possible scenarios of correlation between the ideologies of the President and Senate in the two periods, retirement never takes place if the exogenous probability of retirement is smaller than $\mu$. Second, the more liberal the expected ideology of the Court is if the retiring justice retires in the first period then the more likely that the retiring justice will decide to retire in the first period (as the range of possible values for $\overline{p}$ is $[\mu,1]$ then a reduction in the value of $\mu$ makes retirement more likely). Third, the stronger the correlation is between the two political cycles,

\textsuperscript{22} For example, we could consider that the ideologies of the President and the Senate in the second period are of the form $\delta_1 \alpha_P + (1 - \delta_1) u_1$ and $\delta_2 \alpha_S + (1 - \delta_2) u_2$ respectively, in which $u_1$ and $u_2$ are uniformly distributed variables and $\delta_1$ and $\delta_2$ are constants that capture the degree of persistence of the ideologies. In that case, we could use these expressions to evaluate $M_2$ and $M_3$ as defined in the Appendix. Although non-trivial implications would follow, the technical analysis would be much more involved.
the more likely it is that the retiring justice will retire in the current period.

A similar analysis could be carried out in the case that the retiring justice is the moderate justice. Notice that these new predictions do not invalidate the results uncovered by Proposition 2 which were derived for general values of \( m \) and \( M \).

### 6.3 The role of Pension Eligibility

A number of authors (e.g. Squire 1988, Zorn and Van Winkle 2000, Stolzenberg and Lindgren 2010) have emphasized the relevance of pension eligibility in a justice’s retirement decision. In particular, arguably the Retirement Act of 1937 (50 Stat. 24), which formalized and improved justices’ rights in retirement, encouraged retirements in the Twentieth Century compared to what used to happen before (Squire 1988: 182).23

Although our basic formulation does not consider pension eligibility, we can easily add it to the analysis. In order to do so, we define \( P \) as the pension benefits obtained by the justice if she retires in the current period and \( P_{+} \) as the pension benefits if she retires in the next period — notice that we are not ruling out the possibility that \( P \geq P_{+} \). In addition, we add the constant \( \mu \) to capture the justice’s relative valorization of money and Court decisions. Hence, the utility obtained by the liberal justice if she retires in the second period is given by:

\[
\mu(1-(\alpha_3-M_3)) + P_{+}
\]

But the utility received if she does not retire is given by:

\[
\mu(1-(\alpha_3-\alpha_2))
\]

Comparing these expressions, the justice retires in the second period if and only if

\[
P_{+} > \mu(\alpha_2-M_3)
\]

23 In the Twentieth Century, more than 70% of the vacancies that opened in the Court were associated with spontaneous retirements; the equivalent number for the Nineteenth century was below 33% (Zorn and Van Winkle 2000: 148-149).
In our basic model, justices never retire during the second period, but that was without pension benefits. Now, and intuitively, if pension benefits are large enough then retirement takes place in the second period. Conditional on whether (3) is true or not, retirement decisions will nevertheless be different in the first period. If (3) does not hold then \( J_3 \) does not retire in the second period and retirement takes place in the first period if and only if

\[
\mu(1-(\alpha_3-m_3)) + P > p\mu(1-(\alpha_3-M_3)) + (1-p)\mu(1-(\alpha_3-\alpha_2))
\]

which is equivalent to

\[
p > P = \frac{\alpha_2-m_3-P}{\alpha_2-M_3}
\]

Hence the larger is \( P \) the smaller is \( P \) and the more likely that retirement will occur. The more novel (and interesting) case takes place when (3) is satisfied (that is \( P_+ \) is large enough) and \( J_3 \) retires in the second period. In that case, retirement takes place during the first period if and only if

\[
\mu(1-(\alpha_3-m_3)) + P > p\mu(1-(\alpha_3-M_3)) + (1-p)[\mu(1-(\alpha_3-M_3)) + P_+]
\]

or

\[
p > P = 1 - \frac{\mu(m_3-M_3)+P}{P_+}
\]

In such a scenario, a larger \( P \) unequivocally implies a higher probability of retirement in the current period (period 1). But a higher \( P_+ \) might imply that retirement is more likely as well as less likely; it depends on whether \( \mu(m_3-M_3)+P \) is positive or negative. The intuition is that if by retiring in the second period the justice expects to leave a more liberal Court than if she retires in the first period \( (\mu(m_3-M_3) > 0) \), she will wait to retire in the second period only if the probability of exogenous retirement is large enough. In that context, the larger the promised pension benefits from retirement are in the second period, the more likely it is that she will wait.
to retire in the second period ($\bar{p}$ is increasing in $P_+$ and converges to 1 when $P_+$ converges to $\infty$). But if by retiring in the second period the justice expects to leave behind a considerably more conservative Court ($\mu(m_3 - M_3) + p < 0$), then, for all values of $P_+$, $J_3$ will wait for the second period to retire.

The 1937 structural change of retirement decisions can be easily explained by the model if we consider that $P$ and $P_+$ before 1937 were equal to $P_B$ (B for before) and $P$ and $P_+$ were equal to $P_A$ (A for after) after 1937 with $P_A > P_B$. Then, regardless whether we are in the case in which retirement takes place in the second period or not, retirement in the first period is more likely after 1937 than before.

6.4 Multi-period model

At first glance, it might seem that a major limitation of the model is that we consider that there are only two periods. However, our results hold if we consider that the model has many periods after the first one, which can also be interpreted as the current period.

In order to see that, suppose that the model has $T$ periods and in the last period $J_r$ retires with certainty. In that case, $J_r$ retires at $t = T-1$ if and only if $|\alpha_r - M_r| < |\alpha_r - M_r|$ which obviously is not true. Now suppose that in the last period $T$, $J_r$ does not retire with certainty. In that case $J_r$ retires at $t = T-1$ if and only if $|\alpha_r - M_r| < |\alpha_r - (pM_r + (1-p)\alpha_2)|$ which again is not true. If the retiring justice is the conservative justice, that inequality becomes $\alpha_3 - M_3 < \alpha_3 - (pM_3 + (1-p)\alpha_2)$ which does not hold, and if the retiring justice is the moderate justice, that inequality becomes $|\alpha_2 - M_2| < |\alpha_2 - (pM_2 + (1-p)\alpha_2)|$ which again is not true. We can repeat that process for all periods up to $t = 1$.

Evidently, the key assumption is that the expected ideologies of the President and the
Senate in all future periods are the same. That is why, regardless whether \( J_r \) retires at \( t \) or \( t + 1 \), the expected median of the Court is \( M_r \). The only period in which this is different is the current one, in which the expected median of the Court is \( m_r \).

7. CONCLUSIONS

Most scholars of judicial retirement have found that political factors affect the decision to retire, but exactly how and when those effects arise has previously been unclear. This model shows that if justices seek to shape the direction of the Court after their own exit, then they will pay attention to numerous factors not previously fully appreciated by the literature. This includes: responsiveness to both the position of the nominating President and the confirming Senate – both in the current term and in anticipated future terms; variation in the retirement decision associated with the extremity or moderation of the ideology of the retiring justice – both relative to the rest of the Court and relative to the political actors who nominate her replacement; and although it is easily anticipated that voluntary retirement will increase with age, that relationship is less straightforward than is typically assumed. Although no formal model of judicial retirement previously existed, prior empirical accounts necessarily contain implicit informal models through their assumptions – yet some of those assumptions make little sense and, unsurprisingly, the resulting empirical accounts produced are highly divergent. The greater nuance of our model allows for more specific testable implications for the empirical literature. This potentially offers a mechanism for developing a deeper understanding of the centrally important, yet under-theorized and empirically discordant, question of when and why judges make the decision to retire.
APPENDIX: MATHEMATICAL PROOFS

Calculating $M_3$: Using figure 2 as a reference, we split the calculation of $M_3$ into six expressions that we will gradually add. Calculations are tedious but straightforward.

1. When $\alpha_p < \alpha_1$:

$$\int_0^{\alpha_1} f(x) \left[ \int_0^4 g(y) \alpha_1 dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^{\alpha_1 + \alpha_2} g(y) \left( 2y - \frac{\alpha_1 + \alpha_2}{2} \right) dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^\infty g(y) \frac{\alpha_1 + \alpha_2}{2} dy \right] dx$$

$$= F(\alpha_1) \left[ G\left(\frac{\alpha_1 + \alpha_2}{4}\right) \alpha_1 - \left( G\left(\frac{\alpha_1 + \alpha_2}{2}\right) - G\left(\frac{\alpha_1 + \alpha_2}{4}\right) \right) \frac{\alpha_1 + \alpha_2}{2} \right]$$

$$+ 2 \int_{\frac{\alpha_1 + \alpha_2}{4}}^{\alpha_1 + \alpha_2} g(y) y dy + \left( 1 - G\left(\frac{\alpha_1 + \alpha_2}{2}\right) \right) \frac{\alpha_1 + \alpha_2}{2}$$

$$= F(\alpha_1) \left[ G\left(\frac{\alpha_1 + \alpha_2}{2}\right) - G\left(\frac{3\alpha_1 + \alpha_2}{4}\right) \right] \left( 2E[\alpha_s] \frac{3\alpha_1 + \alpha_2}{4} < \alpha_s < \frac{\alpha_1 + \alpha_2}{2} - \frac{\alpha_1 + \alpha_2}{2} \right)$$

$$+ G\left(\frac{3\alpha_1 + \alpha_2}{4}\right) \alpha_1 + \left( 1 - G\left(\frac{\alpha_1 + \alpha_2}{2}\right) \right) \frac{\alpha_1 + \alpha_2}{2}$$

2. When $\alpha_1 < \alpha_p < \frac{3\alpha_1 + \alpha_2}{4}$:

$$\int_0^{\frac{3\alpha_1 + \alpha_2}{4}} f(x) \left[ \int_0^4 g(y) x dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^{\alpha_1 + \alpha_2} g(y) \left( 2y - \frac{\alpha_1 + \alpha_2}{2} \right) dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^\infty g(y) \frac{\alpha_1 + \alpha_2}{2} dy \right] dx$$

$$= \left( F\left(\frac{3\alpha_1 + \alpha_2}{4}\right) - F(\alpha_1) \right) \left[ \left( G\left(\frac{\alpha_1 + \alpha_2}{2}\right) - G\left(\frac{3\alpha_1 + \alpha_2}{4}\right) \right) \left( 2E[\alpha_s] \frac{3\alpha_1 + \alpha_2}{4} < \alpha_s < \frac{\alpha_1 + \alpha_2}{2} - \frac{\alpha_1 + \alpha_2}{2} \right) \right]$$

$$+ \frac{3\alpha_1 + \alpha_2}{4} \int_{\alpha_1}^{\frac{3\alpha_1 + \alpha_2}{4}} f(x) dx$$

3. When $\frac{3\alpha_1 + \alpha_2}{4} < \alpha_p < \frac{\alpha_1 + \alpha_2}{2}$:

$$\int_{\frac{\alpha_1 + \alpha_2}{4}}^{\frac{3\alpha_1 + \alpha_2}{4}} f(x) \left[ \int_0^4 g(y) x dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^{\alpha_1 + \alpha_2} g(y) \left( 2y - \frac{\alpha_1 + \alpha_2}{2} \right) dy + \int_{\frac{\alpha_1 + \alpha_2}{2}}^\infty g(y) \frac{\alpha_1 + \alpha_2}{2} dy \right] dx$$
\[
\int_{\frac{a_1 + a_2}{2}}^{\frac{a_1 + a_2}{4}} f(x)G(x)dx + \int_{\frac{a_1 + a_2}{4}}^{\frac{a_1 + a_2}{2}} f(x)(G(\frac{a_1 + a_2}{2}) - G(x)) \left[ 2E\left[ \alpha_s | x < \alpha_s < \left(\frac{a_1 + a_2}{2}\right)\right] - \frac{a_1 + a_2}{2}\right] dx
\]
\[+ (F(\frac{a_1 + a_2}{2}) - F(\frac{3a_1 + a_2}{4}))(1 - G(\frac{a_1 + a_2}{2})) \frac{a_1 + a_2}{2}\]

4. When \(\frac{a_1 + a_2}{2} < \alpha_p < \frac{a_1 + 3a_2}{4}\):

\[
\int_{\frac{a_1 + 3a_2}{4}}^{\frac{a_1 + 3a_2}{2}} f(x)G(x)dx - \int_{\frac{a_1 + 3a_2}{2}}^{\frac{a_1 + a_2}{2}} f(x)(G(\frac{a_1 + a_2}{2}) - G(x)) \left[ 2E\left[ \alpha_s | x < \alpha_s < \left(\frac{a_1 + a_2}{2}\right)\right] - \frac{a_1 + a_2}{2}\right] dx
\]
\[+ (F(\frac{a_1 + 3a_2}{4}) - F(\frac{a_1 + a_2}{2}))G(\frac{a_1 + a_2}{2}) \frac{a_1 + a_2}{2} + \int_{\frac{a_1 + 3a_2}{2}}^{\frac{a_1 + 3a_2}{4}} f(x)(1 - G(x))dx\]

5. When \(\frac{a_1 + 3a_2}{4} < \alpha_p < \alpha_2\):

\[
\int_{\frac{a_1 + 3a_2}{4}}^{\frac{a_1 + 3a_2}{2}} f(x)G(x)dx - \int_{\frac{a_1 + 3a_2}{2}}^{\frac{a_1 + a_2}{2}} f(x)(G(\frac{a_1 + a_2}{2}) - G(x)) \left[ 2E\left[ \alpha_s | x < \alpha_s < \left(\frac{a_1 + a_2}{2}\right)\right] - \frac{a_1 + a_2}{2}\right] dx
\]
\[+ (F(\frac{a_1 + 3a_2}{4}) - F(\frac{a_1 + a_2}{2}))G(\frac{a_1 + a_2}{2}) \frac{a_1 + a_2}{2} + \int_{\frac{a_1 + 3a_2}{2}}^{\frac{a_1 + 3a_2}{4}} f(x)(1 - G(x))dx\]

6. When \(\alpha_2 < \alpha_p\):

\[
\int_{\alpha_2}^{\frac{a_1 + a_2}{2}} f(x)G(x)dx + \int_{\frac{a_1 + a_2}{2}}^{\frac{a_1 + 3a_2}{2}} f(x)(G(\frac{a_1 + a_2}{2}) - G(x)) \left[ 2E\left[ \alpha_s | x < \alpha_s < \left(\frac{a_1 + a_2}{2}\right)\right] - \frac{a_1 + a_2}{2}\right] dx
\]
\[+ (1 - F(\frac{a_1 + a_2}{2}))G(\frac{a_1 + a_2}{2}) \frac{a_1 + a_2}{2} + (1 - G(\frac{a_1 + 3a_2}{4})) \frac{a_1 + a_2}{2}\]

Then, adding all the parts we get that \(M_3\) is equal to a weighted average of a Court median when
P and S play a FC, UC or SC game, respectively.

\[
M_3 = \left(1 - F\left(\frac{\alpha_1 + \alpha_2}{2}\right)\right)G\left(\frac{\alpha_1 + \alpha_2}{2}\right) + F\left(\frac{\alpha_1 + \alpha_2}{2}\right)(1 - G\left(\frac{\alpha_1 + \alpha_2}{2}\right)) \right) \frac{\alpha_1 + \alpha_2}{2} +
\]

\[
G\left(\frac{3\alpha_1 + \alpha_2}{4}\right)(\alpha_1 F(\alpha_1) + \int_{\alpha_1}^{3\alpha_1 + \alpha_2} f(x)dx) + (1 - G\left(\frac{\alpha_1 + 3\alpha_2}{4}\right))\alpha_2 (1 - F(\alpha_2)) + \int_{\alpha_1 + 3\alpha_2}^{\alpha_2} f(x)dx +
\]

\[
\frac{\alpha_1 + \alpha_2}{2} \int_{\alpha_1}^{\alpha_1 + \alpha_2} f(x)G(x)dx + \frac{\alpha_1 + \alpha_2}{2} \int_{\alpha_1}^{\alpha_1 + \alpha_2} f(x)(1 - G(x))dx
\]

\[
F\left(\frac{3\alpha_1 + \alpha_2}{4}\right)(2E[\alpha_S | \alpha_S \in \left[\frac{3\alpha_1 + \alpha_2}{4}, \frac{\alpha_1 + \alpha_2}{2}\right]] - \frac{\alpha_1 + \alpha_2}{2}) +
\]

\[
\frac{\alpha_1 + \alpha_2}{4} \int_{\alpha_1}^{\alpha_1 + \alpha_2} f(x)\left(\frac{G\left(\frac{\alpha_1 + \alpha_2}{2}\right) - G(x)}{G\left(\frac{\alpha_1 + \alpha_2}{2}\right) - G\left(\frac{3\alpha_1 + \alpha_2}{4}\right)}\right) \frac{2E[\alpha_S | \alpha_S \in \left[\frac{x, \frac{\alpha_1 + \alpha_2}{2}\right]]}{dx}
\]

\[
(1 - F\left(\frac{\alpha_1 + 3\alpha_2}{4}\right))(2E[\alpha_S | \alpha_S \in \left[\frac{\alpha_1 + 3\alpha_2}{4}, \frac{\alpha_1 + \alpha_2}{2}\right]] - \frac{\alpha_1 + \alpha_2}{2}) +
\]

\[
\frac{\alpha_1 + 3\alpha_2}{4} \int_{\alpha_1}^{\alpha_1 + 3\alpha_2} f(x)\left(\frac{G(x) - G\left(\frac{\alpha_1 + \alpha_2}{2}\right)}{G\left(\frac{\alpha_1 + 3\alpha_2}{4}\right) - G\left(\frac{\alpha_1 + \alpha_2}{2}\right)}\right) \frac{2E[\alpha_S | \alpha_S \in \left[\frac{\alpha_1 + \alpha_2}{2}, x\right]]}{dx}
\]

\[
\textbf{Calculating } M_2: \text{ We follow the same steps used to calculate } M_3. \text{ Then } M_2 \text{ is also given by}
\]

\[
M_2 = \left(1 - F\left(\frac{\alpha_1 + \alpha_3}{2}\right)\right)G\left(\frac{\alpha_1 + \alpha_3}{2}\right) + F\left(\frac{\alpha_1 + \alpha_3}{2}\right)(1 - G\left(\frac{\alpha_1 + \alpha_3}{2}\right)) \right) \frac{\alpha_1 + \alpha_3}{2} +
\]

\[
G\left(\frac{3\alpha_1 + \alpha_3}{4}\right)(\alpha_1 F(\alpha_1) + \int_{\alpha_1}^{3\alpha_1 + \alpha_3} f(x)dx) + (1 - G\left(\frac{\alpha_1 + 3\alpha_3}{4}\right))\alpha_3 (1 - F(\alpha_3)) + \int_{\alpha_1 + 3\alpha_3}^{\alpha_3} f(x)dx +
\]

\[
\frac{\alpha_1 + \alpha_3}{4} \int_{\alpha_1}^{\alpha_1 + \alpha_3} f(x)G(x)dx + \frac{\alpha_1 + \alpha_3}{4} \int_{\alpha_1}^{\alpha_1 + \alpha_3} f(x)(1 - G(x))dx
\]
Proof Proposition 1: We need to verify that the values of $m_2$ and $m_3$ are as given in figures 2 and 3 respectively. We discuss each case separately.

Retiring Justice is conservative: If $\alpha_p < \alpha_1 < (\alpha_1 + \alpha_2)/2 < \alpha_S$, then when $J_3$ retires $P_1$ and $S_1$ nominate and confirm a new justice with ideology $(\alpha_1 + \alpha_2)/2$ because they play a fully constrained (FC) nomination game. Now suppose that $\alpha_p < (3\alpha_1 + \alpha_2)/4 < \alpha_s < (\alpha_1 + \alpha_2)/2$, then the new member of the Court and the Court median will have ideology $2\alpha_S - (\alpha_1 + \alpha_2)/2$ because the President and the Senate play a semi-constrained (SC) nomination game. That is, any nominee to the left of $2\alpha_S - (\alpha_1 + \alpha_2)/2$ will be rejected by the Senate because in that case it would prefer to preserve the default median of the Court, which is $(\alpha_1 + \alpha_2)/2$. Finally, if $\alpha_S < (3\alpha_1 + \alpha_2)/4$, and regardless whether the President or the Senate is more liberal, the two political agents play an unconstrained (UC) game and appoint a justice with ideology $\alpha_p$, and $J_1$ becomes the new median of the Court.

Now suppose that $\alpha_1 < \alpha_p < (3\alpha_1 + \alpha_2)/4$. In that case, the President and the Senate play a FC nomination game as long as $(\alpha_1 + \alpha_2)/2 < \alpha_s$. The resulting median of the Court is
(α₁ + α₂)/2. On the other hand, President and Senate play a UC game when αₛ < (3α₁ + α₂)/4.

In that case, the new nominee and new median of the Court has ideology αₚ. Finally, and as expected, in the intermediate range, αₛ ∈ [(3α₁ + α₂)/4, (α₁ + α₂)/2], they play a SC nomination game that determines a new nominee and median of the Court with ideology 2αₛ − (α₁ + α₂)/2.

We keep moving the ideology of the President to the right. Now suppose that (3α₁ + α₂)/4 < αₚ < (α₁ + α₂)/2. Still it is the case that the President and the Senate play a FC nomination game as long as (α₁ + α₂)/2 < αₛ. Also, it is still the case that President and Senate play a UC game when αₛ < (3α₁ + α₂)/4. The question is what happens when αₛ ∈ [(3α₁ + α₂)/4, (α₁ + α₂)/2]? The answer is: it depends on whether αₛ > αₚ holds. If so, then P₁ and S₁ play a SC nomination game but if the inequality is not true, they play a UC nomination game. We know that in the first case the ideology of the new median of the Court becomes 2αₛ − (α₁ + α₂)/2, while in the second case it becomes is αₚ.

The rest of the analysis follows the same logic but the results are reversed. If αₛ < (α₁ + α₂)/2 < αₚ < (3α₁ + α₂)/4, then P₁ and S₁ play a FC nomination game, in which case the ideology of the new median of the Court becomes (α₁ + α₂)/2. In addition, if (α₁ + α₂)/2 < αₚ < αₛ, then the President can impose his preferred candidate who will become the median of the Court with ideology αₚ. But if (α₁ + α₂)/2 < αₛ < αₚ, P and S play a SC game and the new median of the Court has ideology 2αₛ − (α₁ + α₂)/2.

The President and Senate play a FC nomination game when αₛ < (α₁ + α₂)/2 < αₚ but play a SC game when (α₁ + α₂)/2 < αₚ and (α₁ + α₂)/2 < αₛ < (α₁ + 3α₂)/4. Finally, they play an
UC game when \((\alpha_1 + \alpha_2)/2 < \alpha_p\) and \((\alpha_1 + 3\alpha_2)/4 < \alpha_s\) but the ideology of the new median of the Court will be conditional on whether the President’s ideology is larger or smaller than \(\alpha_2\). The ideology of the new median of the Court becomes \(\alpha_2\) in case that it is larger but becomes \(\alpha_p\) in the case that it is smaller,

Retiring Justice is moderate: As it was with the analysis for the conservative retiring justice, in the case of the moderate justice, the key for the analysis is to identify the scenarios in which the President and the Senate play a FC, SC or UC nomination game. They play a FC game either when \(\alpha_p < (\alpha_1 + \alpha_3)/2 < \alpha_s\) or when \(\alpha_s < (\alpha_1 + \alpha_3)/2 < \alpha_p\). They play a SC game either when \(\alpha_p < (\alpha_1 + \alpha_3)/2\) and \(\max\{(3\alpha_1 + \alpha_3)/4, \alpha_p\} < \alpha_s < (\alpha_1 + \alpha_3)/2\) or when \(\alpha_p > (\alpha_1 + \alpha_3)/2\) and \(\min\{(\alpha_1 + 3\alpha_3)/4, \alpha_p\} > \alpha_s > (\alpha_1 + \alpha_3)/2\). Finally, the President and Senate play a UC game either when: both are very liberal \((\alpha_p < \alpha_1\) and \(\alpha_s < (3\alpha_1 + \alpha_3)/4\), in which case the new median becomes the old liberal justice, J; when both are very conservative \((\alpha_p > \alpha_3\) and \(\alpha_s > (3\alpha_3 + \alpha_1)/4\), in which case the new median becomes the old conservative justice, J; or when both want to move the median of the Court in the same direction but the preferences of the Senate are more extreme \((\alpha_1 < \alpha_p < \alpha_1(\alpha_1 + \alpha_3)/2\) and \(\alpha_s < \max\{(3\alpha_1 + \alpha_3)/4, \alpha_p\}\) or \(\alpha_s > \alpha_p > (\alpha_1 + \alpha_3)/2\) and \(\alpha_s > \min\{\alpha_p, (\alpha_1 + 3\alpha_3)/4\}\), in which case the President imposes his desired ideology for the median of the Court (that is \(\alpha_p\)). End of Proof.

Proof of Proposition 2: i. From inspection of figure 4, it is apparent that the only scenarios in which \(\bar{p} = 0\) are when \(\alpha_{r_1} > \alpha_2\) and \(\alpha_{s_1} > (\alpha_1 + 3\alpha_2)/4\) and the only scenarios in which \(\bar{p} = 1\) are when \(\alpha_{r_1} < \alpha_1\) and \(\alpha_{s_1} < (3\alpha_1 + \alpha_2)/4\).

ii. This time, from inspection of figure 5, it is apparent that for any expected ideology of the
President and the Senate in the next political cycle, it is true that \( \bar{p} = 0 \) if \( \alpha_R = \alpha_2 \) and \( \alpha_s > \alpha_2 \) 
or \( \alpha_s = (\alpha_2 + (\alpha_1 + \alpha_3)/2)/2 \) and \( \alpha_R > (\alpha_2 + (\alpha_1 + \alpha_3)/2)/2 \). Notice that it is never the case that \( \bar{p} = 1 \).

iii. If the retiring justice is the conservative justices then, for a given \( \alpha_s \), the closer \( \alpha_2 \) is to \( \alpha_1 \), the closer \( \bar{p} \) is to 0. The opposite is true the farther away \( \alpha_2 \) is from \( \alpha_1 \).

iv. It is straightforward that in the case of the moderate justice retirement happens more frequently the closer \( m_2 \) is to \( \alpha_2 \) because the closer \( \bar{p} \) is to 0. In the case of the conservative justice, the result seems not to hold because the threshold is given by \( |\alpha_2 - m_3|/|\alpha_2 - M_3| \). However we know that \( m_3 \in [\alpha_1, \alpha_2] \), hence, once more the closer \( m_3 \) is to \( \alpha_3 \) the closer \( \bar{p} \) is to 0.

v. To see that, suppose that the ideologies of the President and the Senate in the second period are uniformly distributed such that \( M_3 = (\alpha_1 + \alpha_2)/2 \) and \( M_2 = (\alpha_1 + \alpha_3)/2 \). then: in figure 4, \( \bar{p} \) becomes 1 whenever \( \alpha_p \) or \( \alpha_s \) are larger than \( (\alpha_1 + \alpha_2)/2 \). Also, \( |\alpha_2 - \alpha_p|/|\alpha_2 - M_3| \) becomes \( 2|\alpha_2 - \alpha_p|/|\alpha_2 - \alpha_1| \), which is decreasing in \( \alpha_p \) and takes values within \([0,1]\). In addition, \( |(\alpha_2 + 3\alpha_3)/4 - 2\alpha_3|/|\alpha_2 - M_3| \) becomes \( |(\alpha_1 + 3\alpha_2) - 4\alpha_3|/|\alpha_2 - \alpha_1| \), which is decreasing in \( \alpha_s \) and also takes values within \([0,1]\). On the other hand, in figure 5, \( \bar{p} \) becomes 1 whenever \( \alpha_p \) or \( \alpha_s \) are larger than \( (\alpha_1 + \alpha_3)/2 \). Also, \( |\alpha_2 - \alpha_p|/|\alpha_2 - M_2| \) becomes \( |\alpha_2 - \alpha_p|/|\alpha_2 - (\alpha_1 + \alpha_3)/2| \), which is decreasing in \( \alpha_p \) and takes values within \([0,1]\). In addition, \( |(\alpha_2 + (\alpha_1 + \alpha_3)/2)/2 - 2\alpha_3|/|\alpha_2 - M_2| \) becomes \( |(\alpha_2 + (\alpha_1 + \alpha_3)/2) - 2\alpha_3|/|\alpha_2 - (\alpha_1 + \alpha_3)/2| \), which is decreasing in \( \alpha_s \) and also takes values within \([0,1]\). Then, for two reasons, retirement variability is larger for the extreme justice than for the moderate justice. First, as
\((\alpha_1 + \alpha_3)/2 > (\alpha_1 + \alpha_2)/2\). the set of possible cases (President and Senate ideologies) for which \(\bar{p} = 1\) is larger in the former than in the latter. Second, while the minimum value of \(\bar{p}\) is 0 in the case that the extreme justice retires, it is \(p = |\alpha_3 - \alpha_2|/|\alpha_2 - (\alpha_1 + \alpha_3)/2| > 0\) in the case that the moderate justice retires.

vi. From proposition 1 we know that \(p > 0\) is a necessary condition for retirement to take place. To see that the other part of the statement is true, take the case of \(p = |\alpha_3 - \alpha_2|/|\alpha_2 - M_2| - \epsilon\) and \(\alpha_n > \alpha_S > \alpha_3\), then the conservative justice retires but the moderate justice does not. On the other hand, take the case of \(p = |\alpha_2 - \alpha_1|/|\alpha_2 - M_2| + \epsilon\) and \(\alpha_n < \alpha_S < \alpha_1\), then the conservative justice does not retire but the moderate justice does. **End of Proof.**

**REFERENCES**


Cameron, Charles, Albert Cover and Jeffrey Segal. 1990. “Senate Voting on Supreme Court Nominees: A Neoinstitutional Model.” *American Political Science Review* 84:525-34.


FIGURES

Figure 1: Timing of Actions

- **First Period**
  - With \( P_{bb} \cdot p \cdot J_r \) doesn’t retire
  - With \( P_{bb} \cdot p \cdot J_r \) retires
  - \( J_r \) doesn’t retire
  - Game moves to second period
  - \( P_1 \) and \( S_1 \) choose \( m_r \)

- **Second Period**
  - \( J_r \) doesn’t retire
  - Median of the Court is \( \alpha_2 \)
  - \( P_2 \) and \( S_2 \) choose \( M_r \)

Legend:
- \( \bigcirc \) = Nature decides;
- \( \diamond \) = \( J_r \) decides
Figure 2: $m_3 = \text{New Median if } J_3 \text{ retires at } t = 1$
Figure 3: $m_2 = \text{New Median if } J_2 \text{ retires at } t = 1$

when $\frac{\alpha_1 + \alpha_3}{2} < \alpha_2$
Figure 4: Value of $\bar{p}$ if $J_3$ considers retirement at $t = 1$

\[
\begin{array}{c|c|c|c}
\alpha_S & \frac{\alpha_2 - \alpha_1}{2(\alpha_2 - M_3)} & \frac{\alpha_2 - \alpha_P}{\alpha_2 - M_3} & 0 \\
\hline
\alpha_2 & \frac{\alpha_1 + 3\alpha_2}{2} & 2\alpha_S & \frac{\alpha_1 + 3\alpha_2 - 2\alpha_S}{\alpha_2 - M_3} \\
\alpha_1 + \frac{3\alpha_2}{4} & \frac{\alpha_1 + 3\alpha_2 - 2\alpha_S}{\alpha_2 - M_3} & \frac{\alpha_2 - \alpha_1}{2(\alpha_2 - M_3)} & \frac{\alpha_2 - \alpha_1}{2(\alpha_2 - M_3)} \\
\alpha_1 & 1 & \frac{\alpha_2 - \alpha_P}{\alpha_2 - M_3} & 0 \\
\hline
\alpha_1 & \frac{3\alpha_1 + \alpha_2}{4} & \frac{\alpha_1 + \alpha_2}{2} & \frac{\alpha_1 + 3\alpha_2}{4} & \alpha_2 & \alpha_P
\end{array}
\]
Figure 5: Value of $\bar{p}$ if $J_2$ considers retirement at $t = 1$