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Preferences and Incentives of Appointed and Elected Public Officials: Evidence from State Trial Court Judges[†]

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We study how two selection systems for public officials, appointment and election, affect policy outcomes, focusing on state court judges and their criminal sentencing decisions. First, under appointment, policy congruence with voter preferences is attained through selecting judges with homogeneous preferences. In contrast, under election, judges face strong reelection incentives, while selection on preferences is weak. Second, the effectiveness of election in attaining policy congruence critically depends on payoffs from the job, which implies that the effectiveness of election may vary substantially across public offices. Third, reelection incentives may discourage judges with significant human capital from holding office. (*JEL* D72, K41)

Understanding systems concerning the selection and retention of public officials and their effects on policy outcomes has long been an important issue in economics (e.g., Barro 1973 and Ferejohn 1986). In this paper, we compare two selection systems for public officials, *appointment* by the head of the executive branch and *election* by popular votes. We study the influence of the selection systems on public officials' behavior, focusing on state court judges and their criminal sentencing decisions. Specifically, we quantitatively assess the separate role of preference heterogeneity versus reelection incentives in determining sentencing decisions.

We focus on the behavior of state court judges in the State of Kansas, which has within-state variation in the selection systems.[1] We conduct three key analyses. First, we exploit variation in sentencing decisions across jurisdictions and over time to quantitatively assess how much preferences and reelection incentives differently affect judges' decisions under the two systems. Secondly, we conduct simulations to

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[1] Even though data from one state may not provide as wide a perspective as national-scale data, they help us to avoid problems caused by substantial heterogeneity in state laws that complicate cross-state analysis. Kansas can also be regarded as a "typical" state in terms of the characteristics of the legal profession. In terms of the population/lawyer ratio, a ratio strongly correlated with the degree of urbanization of the legal profession, it is ranked twenty-fifth among the fifty US states. For details, see Carson (2004).

assess how payoffs affect reelection incentives and sentencing outcomes. Third, we compute how reelection concerns affect incentives to hold office. To conduct these analyses, we specify and estimate a dynamic structural model of judges' behavior in which a judge makes: (a) criminal sentencing decisions, considering both their effect on his reelection probability and his own preference over sentencing, and (b) exit decisions from the bench, considering the payoff offered by the seat on the bench, the payoff offered by his outside options, and his reelection prospects. In the model, components of intrinsic motivation, i.e., judges' preferences over policy choice, under the two systems are estimated. So are the nonpecuniary benefits of holding office. Judges make their policy decisions based on long-term career prospects, and the effects of sentencing behavior on reelection probabilities are estimated. The model is estimated using a newly collected dataset that combines *rich individual-level data* on judges' criminal sentencing decisions with *detailed information on judges' electoral outcomes*, *individual characteristics, and career profiles*. The model is estimated using maximum likelihood, with data on 243 state district court judges who entered the court since 1976.

Our key findings are as follows. First, the sentencing behavior of elected judges is far more variable than that of appointed judges. The sentencing harshness of elected judges is strongly related to the political ideology of the voters in their districts, while that of appointed judges is not. Furthermore, appointed judges' preferences are far more homogenous than those of their elected counterparts. Counterfactuals reveal that if elected judges' preferences were as homogenous as those of appointed judges, the difference in sentencing variation between elected and appointed judges would be 73 percent lower. Hence, higher preference heterogeneity among elected judges than among appointed judges is important in explaining differences in sentencing.

Second, the effectiveness of reelection incentives critically depends on the high prestige (or large payoff in general) from being a judge which is reflected in their low turnover rate. Reelection incentives are relatively ineffective in attaining congruence between policy outcomes and voter preferences when the prestige from office is small. Third, reelection incentives may have the perverse effect of discouraging public officials with a high level of human capital from holding office. Due to reelection concerns, the welfare level of elected judges is much lower than that of appointed judges, making judges with a high level of human capital less interested in the job.

These results have several important implications. First, our result on judges' preferences implies that whether election is more effective than appointment or not in achieving congruence between policy outcomes and voter preferences critically depends on the heterogeneity of voter preferences across jurisdictions. When voter preferences are relatively homogenous, appointment can be better. This is because the appointor (e.g., governor) may have more accurate information about the political preferences of the candidates. The strong selection on preferences under the appointment system may make reelection incentives unnecessary.[2] Second, our result on the influence of payoffs on reelection incentives suggests that the effectiveness of these incentives may vary substantially across public offices. For example, state public

[2] This point is similar to the argument made by Besley and Ghatak (2005) about the lack of high-powered incentives in the public sector. They argue that the match between missions and preferences may economize on the need for explicit monetary incentives.

utility regulators typically show a very high voluntary turnover, with average tenure being less than five years, indicating a low payoff from the job (see Beecher 2013). The effect of reelection incentives on policy outcomes may be very small for such public offices. Third, our result on the negative influence of reelection incentives on the human capital level of judges implies that the desirability of election relative to appointment critically depends on whether the job requires high-quality human capital. If the primary duty of public officials is to represent the ideology of their constituency and if voter preferences vary substantially, then election may be more desirable than appointment. But, if professional skills are essential in fulfilling their tasks, the desirability of reelection incentives needs to be discounted.

Methodologically, the dynamic structural approach we take is essential for several reasons. First, the structural approach enables us to quantify the influence of judges' preferences on their behavior and that of reelection incentives. This feature is important in understanding the mechanisms through which the two systems yield different policy outcomes.[3] Second, the structural approach enables us to conduct counterfactual experiments with the estimation results. We simulate policy outcomes and exit behavior of judges under various alternative configurations of payoffs from the job, which helps us to understand how the advantages of each system depend on the payoffs. Finally, the dynamic modeling of long-term career concerns is also crucial in understanding public officials' behavior. Typically, losing a reelection once has a long-lasting impact on a public official's welfare. This is an important feature of politicians' reelection incentives, given that most elections for public offices in the United States show a strong incumbency advantage (e.g., see Ansolabehere and Snyder 2002), and that the proportion of politicians who return to office after suffering a reelection defeat is very small.[4] The fully dynamic feature of the model is also essential in our counterfactual experiments of public officials' behavior under alternative payoff configurations. The value of holding office varies substantially over a judge's career. A model that ignores long-term considerations would substantially underpredict the influence of payoffs on behavior.

The rest of the article is organized as follows. The next section discusses the related literature. Section II introduces the institutional background of the Kansas state trial courts and provides a preliminary analysis of the data. Section III specifies the model, and Section IV describes its solution, estimation, and identification. Section V summarizes the estimation results. Section VI discusses our counterfactual experiments, and Section VII concludes.

I. Related Literature

The existing study most closely related is Gordon and Huber (2007)—henceforth, GH— who compare criminal sentencing decisions by appointed and elected judges

[3] While we can nonparametrically identify preferences from incentives using variation in judges' payoff from outside options and electoral vulnerability over time, adopting a structural approach allows to precisely quantify the separate components of these effects.

[4] For example, in Diermeier, Keane, and Merlo (2005), the proportion of congressmen returning to office after exit is less than 5 percent. To reflect this feature, an exit from the bench is modeled as an absorbing state. For a given reelection probability function, a forward-looking judge with a long career horizon would respond to reelection more sensitively than one closer to the end of his career or one with a myopic view. Hence, modeling one's choice as a short-term problem causes bias in the estimation of reelection probability function.

in Kansas. They find that the probability of incarceration is higher and the average sentenced jail time is longer when elected judges determine the outcome. They also document the effect of electoral proximity on elected judges' sentencing to argue that the difference between elected and appointed judges in sentencing harshness is mostly attributable to reelection incentives rather than selection on preferences. This study differs from GH in terms of data, measurement of sentencing harshness, econometric approach, and findings. First, they restrict the scope of their sentencing data to only those felonies for which there are more than 250 cases across the state and for which incarceration is a possible outcome, while we use the entire set of non-drug felony cases regardless of the offense category.[5] Second, GH focus on the *average* sentencing harshness under the two systems, using *nonnormalized* jail time. In contrast, we focus on the *variability* of sentencing harshness, using a *normalized* measure that takes into account the range of judge's discretion imposed by the sentencing guidelines in each case.[6] Third, in terms of the econometric approach, they examine the reduced form relationship between institution and sentencing behavior. In contrast, we use a structural approach to precisely quantify the influence of preferences and reelection incentives on sentencing as well as to conduct counterfactual experiments. Lastly, our result partially confirms GH's in that reelection incentives have significant influence on judges' sentencing behavior. However, our findings indicate that preference heterogeneity is the primary factor that explains the difference in sentencing variability between appointed and elected judges.

There also exist other studies on judicial selection mechanisms. For example, Hanssen (2004) documents that US states with tight political competition between rival parties tend to have appointed rather than elected judges. Besley and Payne (2003) investigate the empirical difference in filings of employment discrimination charges under various judicial selection mechanisms. Hall (2001) documents statistics of judicial elections such as the overall rate of incumbent judges being challenged and defeated, and the average vote share.

This study also contributes to the growing literature comparing the behavior of nonelected and elected public officials. One branch of this literature demonstrates that different selection systems yield different preference types of public officials. For example, Besley and Coate (2003) show that selecting regulators through election as opposed to appointment yields the *preference types* of regulators who will conform to voters' preference as opposed to the organized interests of the electricity industry. They use a static model which ignores reelection incentives. Another branch of the literature focuses on how reelection incentives affect the behavior of ex ante identical agents (e.g., Maskin and Tirole 2004, and Alesina and Tabellini 2007). One of the major contributions of this article is to quantify the influence of *reelection incentives* on public officials' decision making, a factor which has been

[5] This left them with a handful of person crimes (assault, criminal threat, robbery, sexual assault) and property crimes (theft, burglary, arson) which constitute approximately one-third of nondrug crimes. In addition, GH use the data from 1997 to mid-2003, while our data cover mid-1996 to 2006.

[6] Our measure of sentencing harshness, normalized relative to minimum and maximum jail time imposed by the guidelines, yields a result that the difference between appointed and elected judges occurs primarily in the *variability* of sentencing harshness rather than in *average* sentencing harshness. Normalization of sentencing harshness is crucial, because there is substantial variation in the severity level of cases across political orientation of districts and across selection systems.

analyzed primarily in the theoretical literature, and jointly estimate the distribution of *preference types* of public officials selected under the two systems.[7]

Further, this study contributes to the literature on compensation for politicians. Besley (2004) lays out a political agency model in which higher salary improves congruence between voter preferences and policy outcomes. Messner and Polborn (2004) and Caselli and Morelli (2004) both theoretically analyze the relationship between compensation and the quality of politicians. A major innovation of this study is to analyze the influence of compensation on policy choice and sorting of politicians *in conjunction with the selection systems*. We provide insights on how compensation affects the advantages of each selection system.

Methodologically, this article extends a study by Diermeier, Keane, and Merlo (2005), in which congressmen's dynamic career decisions are modeled. While they abstract from congressmen's policy decisions and treat policy achievements as exogenous, we endogenize policy decisions and recover major factors that cause different distributions of policy decisions under different systems.

There has also been a stream of economic research on judges' decisions that has typically been focused on one of the three following dimensions: (i) strategic interaction between the judicial branch and other branches of government (e.g., Spiller and Gely 1992), (ii) the effect of judges' background on their decisions (e.g., Ashenfelter, Eisenberg, and Schwab 1995) and (iii) judges' career concerns (e.g., Levy 2005). One of the innovations of our research is to specify a unified empirical framework in which judges' decisions interact with their long-term career concerns, their backgrounds, and the political environments in which they operate.

II. Institutional Background, Data, and Preliminary Analysis

A. *Institutional Background*

There are 160 state district court judgeships in 31 judicial districts in the State of Kansas. There are two systems used to select and retain judges for the Kansas state district courts. Under the *election* system, judges are selected and reelected through competitive elections. Under the *appointment* system, when there is an open seat on the bench, the governor appoints a new judge. When the term of the judge expires, he faces a yes-or-no majority decision by voters without facing a challenger, which is known as a "retention election."[8] If an incumbent judge fails to gain the support of the majority of voters, his seat becomes vacant, and the governor appoints a new judge. Otherwise, he is retained and faces further retention elections at the end of every term.[9] Among 31 judicial districts, 17 districts (the unshaded region in

[7] Our finding also implies that the effect of selection systems on the preference distribution of the judiciary can be quite different from the case of other public offices such as regulators, studied in Besley and Coate (2003). In the case of regulators, a conflict of interests between unorganized voters (consumers) and organized industry, rather than the variability of public officials' preference, is the key factor to consider in comparing the two systems.

[8] This combination of gubernatorial appointment and retention elections has other labels such as "Merit Selection" (because there often exists a nomination committee that recommends candidates to the governor based on candidates' merit) or "Missouri Plan" (because the procedure was first approved by citizens of Missouri in 1940).

[9] In the United States, 16 states currently use appointment and retention elections, and 19 states use competitive elections. Other states use different types of systems such as appointment-and-reappointment or appointment-with-life-tenure. Since the first two systems are more common, we focus our analysis on the difference between the

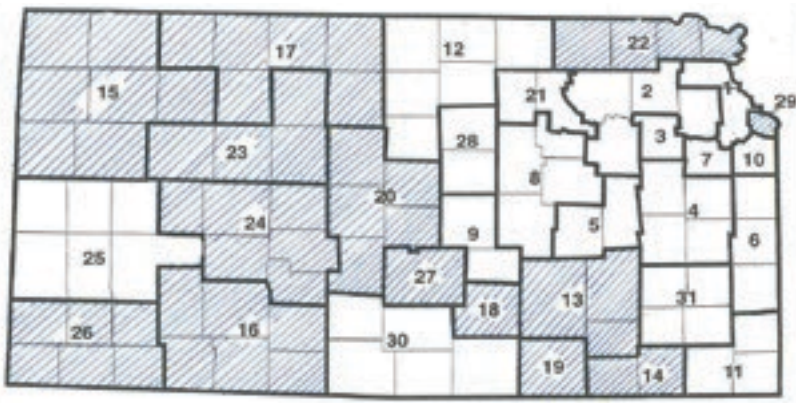

FIGURE 1. GEOGRAPHICAL DISTRIBUTION OF THE TWO SYSTEMS IN KANSAS

Figure 1) use the appointment system, and these districts constitute 87 judgeships. In the remaining 14 districts (the shaded region in Figure 1), judges are elected, and these districts constitute 73 judgeships.[10]

The two systems have similar distribution of judicial districts in terms of social and political characteristics.[11] Classifying as metropolitan those judicial districts that have populations larger than 50,000 per county, six out of 31 districts are metropolitan.[12] Among these six, three (Districts 3, 7, and 10) have appointed judges, and three (Districts 18, 27, and 29) have elected judges. Classifying districts based on political orientation, out of 11 that are relatively liberal, six have appointed judges and five have elected judges.[13]

Under both systems, the term of each district judge is four years. As for the electoral cycle, 59 percent of the seats are up for election in the same year as the presidential election, and the rest in the year of midterm elections. One of the main tasks that district court judges perform is criminal sentencing,[14] which is guided by the Kansas Criminal Sentencing Guidelines. Under these guidelines, criminal cases are

two. Even though appointment system combined with retention elections may seem different from appointment-and-reappointment or appointment-with-life-tenure, retention elections give almost no reelection incentives as indicated by Figure 4 in Section IIB and results in Section 5 of the online Appendix. Hence, implications from our study also apply to other appointment systems that are not combined with retention elections.

[10] The history of the judicial selection mechanisms in Kansas is described in Section 2.1 of the supplementary material.

[11] A more detailed documentation of the socioeconomic characteristics of judicial districts under the two systems is in Section 2.2 of the supplementary material.

[12] The judicial districts that are classified as metropolitan districts are as follows: Districts 3 (Shawnee County which contains the capital city Topeka), 7 (Douglas County), 10 (Johnson County), 18 (Sedgwick County, which contains City of Wichita), 27 (Reno County), and 29 (Wyandotte County, which contains Kansas City).

[13] The judicial districts that are classified as liberal districts are Districts 1, 3, 5, 6, 7, 11, 18, 19, 23, 27, and 29. The classification of political orientation is based on the normalized vote share of Democratic candidates (i.e., Democratic vote share/(Democratic + Republican vote share)) in gubernatorial and presidential elections from 1950 to 2006. Specifically, in liberal districts, the average normalized vote share of Democratic candidates is larger than 49 percent in gubernatorial elections and larger than 38 percent in presidential elections. (Since Kansas is favorable to the Republican party in national politics, there is a discrepancy between the criteria of vote share from the gubernatorial election (state politics) and the presidential election (national politics), but the two criteria yield identical classification results).

[14] Among the 45.4 million nontraffic cases entering state courts in 2004, nearly half (20.7 million) were criminal cases. See National Center for State Courts (2005). It has also been well documented that criminal sentencing is

Table 1—Characteristics of the Districts under the Two Systems in Kansas

	Appointed	Elected
Number of districts	17	14
Number of judges	87	73
No. of metropolitan districts	3	3
Number of liberal districts	6	5

categorized based on the defendant's criminal history and the severity of offenses. The guidelines specify the maximum, standard, and minimum jail time for each category of case characteristics. Once a defendant is convicted, judges have discretion over jail time, which can vary from the specified minimum to the maximum.[15]

B. *Data and Preliminary Analysis*

We constructed a dataset containing detailed information on 243 Kansas state district court judges who entered office since the 1976 general elections. For judges who left before 2006, we observe their complete tenure on the bench. For judges who stayed on the bench in 2006, the spell is right censored. Table 2 shows the composition of these judges, their backgrounds, and their exit-related behavior.

Judges' Characteristics and Exit Behavior.—Under both systems, there is a substantial variation in judges' backgrounds. Elected judges enter the bench at a slightly older age than their appointed counterparts. However, the variation among elected and appointed judges is much larger than the average difference between the two groups. In addition, we observe a shorter tenure on the bench for elected judges. Further, elected judges who leave the bench are more likely to work than to retire. Both these patterns indicate that elected judges face stronger reelection concerns than do appointed judges.

Sentencing Decisions.—The dataset on sentencing decisions is created from the raw data that contain all the nondrug felony crime sentencing outcomes from mid-1996 to 2006 in Kansas, with detailed case characteristics such as defendants' criminal history, the primary offense, and the severity level of the offense. We have data on 53,980 decisions by the judges in our dataset. We normalize sentencing of jail time, relative to the minimum and maximum jail time specified in the Kansas State Sentencing Guidelines, and aggregate it for every two-year period for each judge to five different categories–Harsh (H), Standard-harsh (SH), Standard (S), Standard-lenient (SL), and Lenient (L). For example, a Lenient decision by a judge for a period means that his most frequent sentencing decision is close to the minimum jail time specified in the guidelines. A Harsh decision means that his most frequent sentencing decision is close to the maximum.[16] In aggregating cases, we

regarded as one of the most important issue areas in the judicial elections. For details, see Goldberg, Holman, and Sanchez (2002).

[15] The table of sentencing guidelines is contained in Section 1.1 of the supplementary material.

[16] In the online Appendix, we provide a detailed description of the raw sentencing data and the aggregation scheme. We also document robustness of the major sentencing patterns to alternative aggregation schemes.

TABLE 2—JUDGE COMPOSITION (*Total: 243 Judges*)

	Appointed		Elected	
Overall frequency	116		127	
	(47.7)		(52.3)	
Panel A. Party affiliation and political orientation of the district				
	Democrat	Republican	Democrat	Republican
Overall frequency	62	54	56	71
	(53.5)	(46.5)	(44)	(56)
By political orientation				
Conservative district	34	32	12	31
	(54.8)	(59.3)	(21.4)	(43.7)
Liberal district	28	22	44	40
	(45.2)	(40.7)	(78.6)	(56.3)
Panel B. Individual judges' characteristics				
	Appointed		Elected	
Entry age (years)				
Mean	44.7		46.3	
Standard deviation	7.4		8.0	
Observed tenure (years)				
Mean	14.4		11.1	
Standard deviation	7.2		6.3	
Years in private practice				
Mean	13.8		14.2	
Standard deviation	7.9		9.9	
Panel C. Exit-related outcomes				
Exit time				
Before 2006	31		52	
	(27)		(42)	
Mode of exit				
Voluntary	31		36	
	(100)		(69)	
Defeat	0		16	
	(0)		(31)	
Choice after exit				
Work	8		36	
	(26)		(69)	
Retire	23		16	
	(74)		(31)	
Wage after exit (dollar)				
Mean	70,815		67,363	
Standard deviation	10,979		18,176	

Notes: Numbers in parentheses show relative frequencies (percentage). For appointed judges, their party affiliation does not explicitly appear on the ballot. Hence, we use the party affiliation of the appointing governor as the party affiliation of the judge. To our knowledge, information on their own party affiliation is not publicly available, and appointing governor's party affiliation is the best proxy information for their party affiliation. This way of coding is consistent with the way that judges' party has been coded in other studies of judges where explicit party labels are not available. For example, see Yoon (2006). The party affiliation of the governor during the data period was Republican (1975–1979)—Democrat (1979–1987)—Republican (1987–1991)—Democrat (1991–1995)—Republican (1995–2003)—Democrat (2003–).

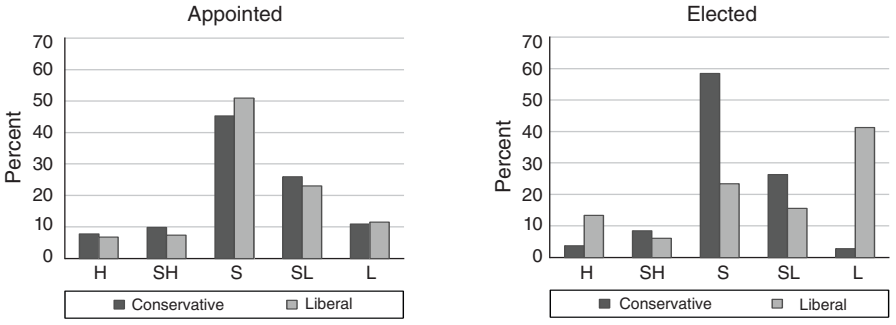

FIGURE 2. DISTRIBUTION OF SENTENCING DECISIONS BY POLITICAL ORIENTATION

weight each criminal case with the standard prison time specified in the sentencing guidelines. Since high-profile crimes, such as murder and rape, have longer standard prison time, high-profile offenses receive larger weights in the aggregation process.[17] The aggregation yields 624 judge-periods of sentencing decisions.

Figure 2 summarizes overall patterns of sentencing decisions under the two systems for judges in conservative and liberal districts. When judges are appointed, sentencing decisions show negligible differences across the political orientations of judicial districts. In contrast, elected judges' sentencing behaviors differ markedly across political orientations.[18] In particular, there is a substantial difference in the relative frequency of Lenient decisions. While elected judges in conservative districts make Lenient decisions only 2.8 percent of the time, elected judges in liberal districts do so 41.3 percent of the time.

Figure 3 summarizes the relative frequency of five sentencing decisions for four different groups of judges: appointed Democrats, appointed Republicans, elected Democrats, and elected Republicans. The figure shows two notable patterns. First, appointed judges' relative frequency of Standard decisions is substantially higher than that of elected judges. Second, while appointed judges show almost no difference between Democrats and Republicans, elected judges show a substantial difference between the two parties.[19] Moreover, elected Republicans show a relatively more lenient pattern of sentencing decisions than elected Democrats, which contradicts the conventional view about the relationship between parties and attitudes to crime. In Section VA, these patterns will be discussed in conjunction with the reelection concerns that judges from different parties have.

Figure 4 shows the defeat rates of elected and appointed judges. The rate at which elected judges are defeated shows high fluctuation across time. While there are years in which no defeats occur, 15.6 percent of elected incumbent judges who chose to

[17] Standard prison time is a conventional measure employed in criminology to weight criminal cases of heterogeneous severity. We also tested the robustness of our classification using the Wolfgang-Sellin Index, another traditional measure of severity used in criminology. (See Sellin and Wolfgang 1978 for details.) Classification based on the two different weights gave almost identical results.

[18] The difference in elected judges' behavior across districts is statistically significant at 1 percent level under χ^2 -test.

[19] Both of these differences are statistically significant at 1 percent level under χ^2-test.

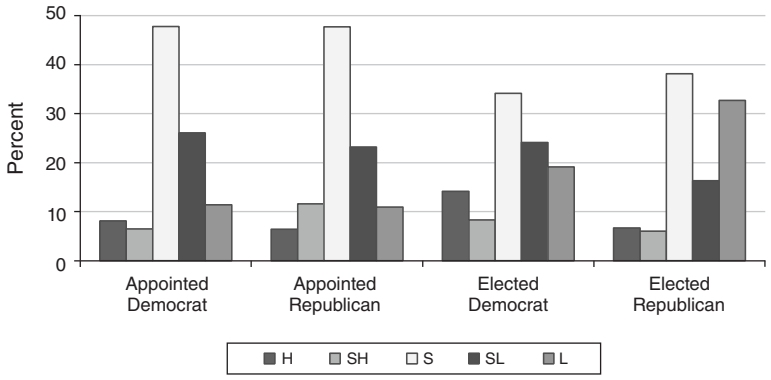

FIGURE 3. DISTRIBUTION OF THE SENTENCING DECISIONS BY POLITICAL PARTY

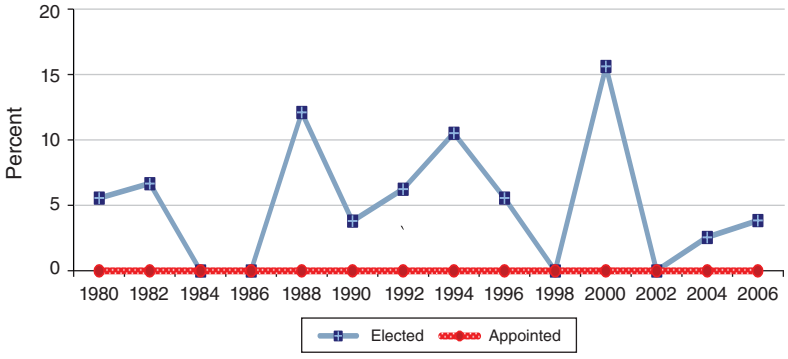

FIGURE 4. DEFEAT RATES OF APPOINTED AND ELECTED JUDGES

run failed in the 2000 elections. In contrast, appointed judges show a very different pattern of reelection: no judges failed to be reelected during the entire data period.

III. Model

We develop a finite-horizon dynamic model of judges' decisions after entering the bench. The length of a period is two years.[20] The earliest age when a judge can enter the bench is 29, and if he stays to the age of 75, the age of mandatory retirement, he must leave.[21]

At the beginning of each period, a judge makes a sentencing decision $p_{it} \in \{H, SH, S, SL, L\}$, considering both his own preference and the effect of sentencing decisions on his reelection prospects. At the end of each period, he observes voters' preference over parties (the "political climate") and decides whether to stay on the bench or exit voluntarily ($c_{it} \in \{Stay, Exit\}$). If a judge exits, he can choose to have an

[20] We assume that one period is two years, because we observe 40 percent of voluntary exits in the middle of a term. This also allows for the possibility that the effect of sentencing decisions at an early point in a term can differ from those at a later point in a term.

[21] Age 29 is the youngest age observed in our data, and age 75 is the mandatory retirement age.

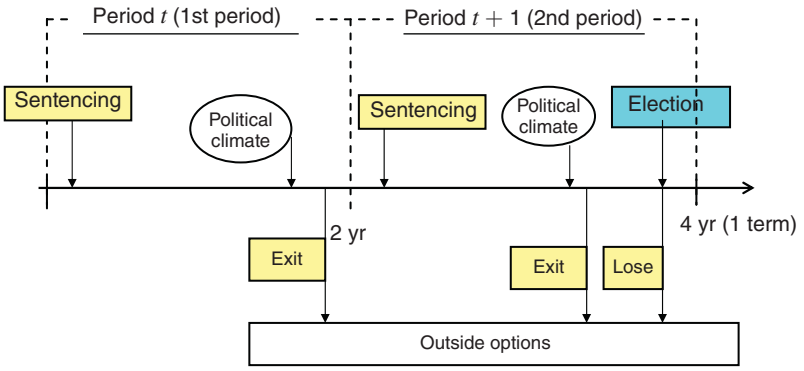

FIGURE 5. TIMING OF EVENTS

outside legal job or retire.[22] In making exit decisions, he compares his long-term payoff from having a seat on the bench, and his payoff from outside options. When a judge decides to run for reelection, which is equivalent to not exiting in a reelection period, he incurs the cost of running, denoted by α_R. The timing of events is illustrated in Figure 5.

In making his decisions, a judge takes into account three primary factors: (i) his payoff from having a seat on the bench, (ii) his reelection probability, and (iii) his postexit (out-of-bench) payoff. We discuss these three components in turn.

A. *Payoff from the Seat on the Bench*

The per-period payoff, $v(T_i, p_{it})$, that a judge i derives in period t consists of his wage,[23] W_B, the nonpecuniary benefit from the seat, α_B, and his utility from sentencing, u. The latter depends on his preference type, T_i, and his sentencing decision, p_{it}.[24] More precisely, we assume

$$v(T_i, p_{it}) = W_B + \alpha_B + u(T_i, p_{it}) + \zeta_{it}^{p}, \tag{1}$$

where ζ_{it}^{p} is a stochastic component of the payoff ("taste shock").[25] There are three possible preference types ($T_i \in \{t_1, t_2, t_3\}$): harsh, standard, and lenient.

The functional form of the payoff from sentencing $u(T_i, p_{it})$ is specified as follows. We first specify a utility function $\tilde{u}(x_i^*, x)$ with respect to (normalized) jail time x, a continuous variable, and judge i's most preferred point x_i^*. Then, we derive the utility

[22] We also observe 13 cases of promotion to higher courts. We incorporate the observed probability of promotion and the payoff from high courts, α_H, into our dynamic programming problem and estimate α_H with other parameters.

[23] The judicial salary is directly observed. It is available through the Judicial Salary Resource Center at the National Center for State Courts: http://www.ncsconline.org/D_KIS/Salary_Survey/query.asp.

[24] There are also judges who do not make sentencing decisions ("noncrime judges"), such as administrative judges. We assume that they receive an additional fixed payoff α_{NC}, and it replaces $u(T_i, p_{it})$. α_{NC} is estimated with other parameters.

[25] We assume that the taste shocks (ζ_{it}^{H}, ζ_{it}^{SH}, ζ_{it}^{S}, ζ_{it}^{SL}, ζ_{it}^{L}) attached to the sentencing decisions are drawn from the type I extreme value distribution with a scale parameter σ_Z. Type I extreme value distribution is commonly used in dynamic discrete choice models (see, e.g., Rust 1987) because it gives a closed form formula for value functions and choice probabilities, saving on computational costs.

function $u(T_i, p_{it})$ from this underlying utility function $\tilde{u}(x_i^*, x)$. To specify the utility function $\tilde{u}$, we normalize the minimum and maximum jail times as 0 and 1, respectively, implying that any observed jail time is a real number in the unit interval. A judge's payoff from jail time x, when his bliss point is x_i^*, is specified as

$$\tilde{u}(x_i^*, x) = \gamma \cdot \exp\left(-\left(\frac{x_i^* - x}{\sigma_u}\right)^2\right) - \gamma, \tag{2}$$

where γ and σ_u are scale parameters (with $\gamma > 0$, $\sigma_u > 0$).[26, 27] The bliss points of harsh and lenient types are normalized to be 1 and 0, respectively. That of standard types, denoted x_S^*, is estimated along with the other parameters of the model. Turning to the utility function u, we specify the payoff from each sentencing decision in $\{H, SH, S, SL, L\}$ to be the average payoff from each of five intervals of jail time of equal length under judges' discretion. That is, the range of the normalized jail time $[0, 1]$ is divided to five intervals, $[0, 0.2)$, $[0.2, 0.4)$, $[0.4, 0.6)$, $[0.6, 0.8)$, and $[0.8, 1.0]$, which correspond to L, SL, S, SH, and H, respectively. Then, for example, the utility $u(T_i, H)$ from Harsh sentencing decision is the average of the payoff $\tilde{u}(x_i^*, x)$ from $x \in [0.8, 1]$. Thus,

$$u(T_i, p_{it}) = \begin{cases} \int_0^{0.2} \tilde{u}(x^*, x)\, dx/0.2, & \text{if } p_{it} = L \\ \int_{0.2}^{0.4} \tilde{u}(x^*, x)\, dx/0.2, & \text{if } p_{it} = SL \\ \int_{0.4}^{0.6} \tilde{u}(x^*, x)\, dx/0.2, & \text{if } p_{it} = S \\ \int_{0.6}^{0.8} \tilde{u}(x^*, x)\, dx/0.2, & \text{if } p_{it} = SH \\ \int_{0.8}^{1} \tilde{u}(x^*, x)\, dx/0.2, & \text{if } p_{it} = H \end{cases} \tag{3}$$

[26] We use the bell-shaped utility function for two reasons: (i) single peakedness and (ii) *flexibility* in terms of curvature. As for (i), canonical models of electoral competition with one-dimensional policy space employ single-peaked utility functions. As for (ii), an immediate alternative would be a quadratic utility function, which has often been used in the theoretical political economy literature. However, a quadratic utility form is not suitable for the estimation because of its restrictiveness, in particular, global concavity. A globally concave utility function implies that an option that is far from one's bliss point is extremely unlikely to be chosen. Hence, the likelihood value can be extremely sensitive to even a very small number of observations of the choice that is far from the bliss point. In contrast, a bell-shaped utility function does not impose the restriction of global concavity. Specifically, the bell-shaped functional form is suitable for accommodating three possible patterns: (i) slow decrease in utility around the bliss point, hence, frequent small deviations from the bliss point, (ii) steep decrease in utility beyond a certain distance, and (iii) slow decrease in utility at a point even farther from the bliss point. This bell-shaped utility function has been extensively used in the empirical literature of politicians' policy choice, due to its flexibility. For example, see Poole and Rosenthal (2000).

[27] The parameter γ which reflects the disutility of deviating from one's bliss point is estimated for each of the three preference types.

where

$$x^* = \begin{cases} 1, & \text{if } T_i = t_1(\text{harsh type}) \\ x_S^*, & \text{if } T_i = t_2(\text{standard type}) \\ 0, & \text{if } T_i = t_3(\text{lenient type}). \end{cases} \tag{4}$$

B. *Reelection Probability*

We assume that appointed judges are reelected with probability one.[28] The reelection probability of elected judges follows a probit model. There are three groups of variables that enter the model: variables that capture the effect of sentencing decisions; individual judges' characteristics; and variables that capture voters' party preferences. The first group includes the aggregate of sentencing decisions that a judge makes in the two periods in the term, p_{it-1} and p_{it}.[29] To capture voter preferences regarding sentencing decisions, we include the political orientation of districts. This orientation can be either conservative or liberal ($Dist_i \in \{Con, Lib\}$) and is constant over time. It captures voters' *long-term* preference over *criminal sentencing*. In addition, to help identification of the effect of nonsentencing variables (e.g., party affiliation), we also include judges who make no sentencing decisions, e.g., administrative judges. Thus, we include a dummy variable ($Noncrime_i$) that has value 1 when a judge is in a position in which he does not make sentencing decisions. The second group of variables, i.e., individual judges' characteristics, includes their age (Age_{it}) and tenure on the bench ($Tenure_{it}$). The third group of variables concerning voters' party preferences includes judges' party affiliation ($Party_i \in \{Democrat(D), Republican(R)\}$) and district-level political climate. The political climate SOD_{it} ("state-of-the-district") captures voters' *short-term* preference over *parties*.[30] This variable can have three values ($SOD_{it} \in \{1, 2, 3\}$), which are "favorable to Republicans," "neutral," "favorable to Democrats," respectively. We measure SOD_{it} by the normalized vote share of Democratic candidates in the presidential and gubernatorial elections, which is a measure ex post observed by the econometrician. The political climate is measured election by election, while the

[28] This is a realistic assumption, based on Figure 4. Moreover, in a preliminary analysis, we *estimated* the reelection probability function of appointed judges using the distribution of vote share and the theoretical relationship between reelection probability and vote share based on the probabilistic voting model. And, the *estimated* reelection probability is equal to one. This alternative specification in which we *estimate* the reelection probability function of appointed judges is described in Section 5 of the online Appendix.

[29] We assume that voters take into account only the judge's behavior in the term (the two periods) immediately prior to an election. This assumption simplifies the state space of our model substantially. At the same time, it is close to reality, since voters are often alleged to have a "short memory" about politicians' behavior.

[30] The rationale for separating the long-term political orientation of districts and short-term political climate is as follows. When there is a nationwide or statewide issue that affects the overall popularity of the two parties, the election of local (district-level) offices can also be affected. For example, skepticism about George W. Bush's war on Iraq affected the overall popularity of Republicans in the 2006 elections. Hence, we need to incorporate this factor in the voters' preference over parties. However, such an issue would not have a meaningful effect on voters' preference over judges' criminal sentencing. Hence, we use a short-term measure "political climate" for preference over parties and long-term measure "political orientation of districts" for voters' preference over sentencing.

political orientation of districts is based on the average vote share throughout the period.[31]

To summarize, the vector of variables that affect the reelection probability, $\mathbf{XR}_{it}$, is

$$\mathbf{XR}_{it} = (p_{it-1}, p_{it}, Dist_i, Noncrime_i, Age_{it}, Tenure_{it}, Party_i, SOD_{it}). \tag{5}$$

The reelection probability of elected judges, denoted by *WINP*, is specified as

$$WINP = \Pr\{g(\mathbf{XR}_{it}) + \eta_{Eit} \geq 0\} = \Phi(g(\mathbf{XR}_{it})), \tag{6}$$

where η_{Eit} is a stochastic component of the electoral outcome, with $\eta_{Eit} \sim N(0, 1)$, and $\Phi(\cdot)$ is the standard normal c.d.f. The specification of the function $g(\cdot)$ is in Section A in the Appendix.

C. *Postexit Decision and Payoff*

When a judge exits from the bench, he may receive a pension benefit. Pension eligibility is determined by age and tenure, and the amount is determined by cohort (time of entry to the court) and tenure.[32] Upon exit, a judge must also choose whether to retire or have a full-time legal occupation. When he chooses to work, his wage, denoted by W_i, depends on his experience in private law practice before he entered the bench.[33] Formally, we assume that

$$\ln W_i = \beta_0 + \beta_1 \cdot Expriv1_i + \beta_2 \cdot Expriv2_i + \beta_3 \cdot Expriv3_i + \epsilon_i^W, \tag{7}$$

where (*Expriv*1, *Expriv*2, *Expriv*3) is a set of dummy variables for three groups of judges' work history (1–5 years, 6–10 years, and more than 10 years of experience in private law practice), and ϵ_i^W is a stochastic component of the wage ($\epsilon_i^W \sim N(0, \sigma_W^2)$). If a judge chooses to retire, he enjoys the value of leisure, denoted by α_L. To sum up, in the event of retirement, a judge's per-period payoff is

$$UR_{it} = \alpha_L + \text{Pension}(Age_{it}, Tenure_{it}, Cohort_i), \tag{8}$$

and when he chooses to work, it is

$$UW_{it} = W_i + \text{Pension}(Age_{it}, Tenure_{it}, Cohort_i). \tag{9}$$

[31] The political climate SOD_{it} evolves stochastically over time, following a Markov process. The details of the classification scheme are described in the online Appendix.

[32] The pension rule is specified in Kansas state statute chapter 20—article 26 (20–2610). Kansas judges can retire with full benefits under three conditions: (i) age 65 with one year of service; (ii) age 62 with ten years of service; or (iii) any age when age and years of service added together equal 85. The amount of benefit is final average salary × statutory multiplier × years of service. If a judge entered the court before July 1987, the statutory multiplier is 5 percent up to ten years and 3.5 percent for each additional year, to a maximum of 70 percent. If a judge entered the court after July 1987, the statutory multiplier is 3.5 percent to a maximum of 70 percent. The eligibility does not depend on whether a judge retires or he gets another job.

[33] Judges also have variation in their experience in the public law office or their tenure on the bench. We excluded these variables from the wage equation, since they were not important predictors of income in our data.

TABLE 3—SUMMARY: SPECIFICATION OF PAYOFFS AND ELECTED JUDGES' REELECTION PROBABILITY

State variable	Per-period payoff from the bench	Reelection probability	Out-of-bench payoff
Preference type	Yes	No	No
Sentencing decision	Yes	Yes	No
Age	No	Yes	Yes
Tenure	No	Yes	Yes
Cohort	No	No	Yes
Party	No	Yes	No
District's political orientation	No	Yes	No
Political climate	No	Yes	No
Preentry career details	No	No	Yes

Table 3 summarizes the specification of payoffs and elected judges' reelection probability function by showing whether each state variable is an argument of those functions or not.

IV. Solution, Estimation, and Identification

Our model is solved by backward induction and estimated with simulated maximum likelihood using the nested algorithm as in Rust (1987).[34] For the construction of the likelihood function, we specify the conditional probability of the choices at each decision node, which is derived from the value functions of the dynamic programming problem. Value functions are calculated starting from the final, absorbing state, which is the occupation choice after exit. Value functions for the exit from the bench and sentencing decisions are subsequently calculated.

A. *Value Functions and Choice Probabilities*

Decisions after Exit.—Since exit from the bench is an absorbing state, the present discounted values (PV) of complete retirement (VR_{it}) and of working (VW_{it}) are simplified as follows:

$$(10)\qquad VR_{it} = \sum_{\tau=t}^{\tau=T}\left[\delta^{\tau-t}\,\Pi_{s=t}^{s=\tau}(1-\pi_d(Age_{is}))\cdot UR_{i\tau}\right]$$

$$VW_{it} = \sum_{\tau=t}^{\tau=T}\Big[\delta^{\tau-t}\,\Pi_{s=t}^{s=\tau}(1-\pi_d(Age_{is}))\times\big\{\Pi_{s=t}^{s=\tau}(1-\pi_r(Age_{is}))\cdot UW_{i\tau} + (1-\Pi_{s=t}^{s=\tau}(1-\pi_r(Age_{is})))UR_{i\tau}\big\}\Big].$$

In these expressions, δ is the discount factor, $\pi_d(Age)$ is the probability of death at each age, $\pi_r(Age)$ is the probability that a judge will eventually retire from his post-exit occupation, and UR and UW are per-period payoffs in the case of retirement and

[34] The component of the model for which we use simulation is the present discounted value of exit options which includes wage from law practice. Since the wage equation contains a stochastic component that follows the normal distribution, we use random draws from the normal distribution to calculate the value function.

choosing off-bench legal occupation, respectively.[35] Denote the state variables that affect the value of exit by $\mathbf{XE}_{it}$, i.e.,

$$\mathbf{XE}_{it} = (Age_{it}, Tenure_{it}, Cohort_i, Expriv1_i, Expriv2_i, Expriv3_i). \tag{11}$$

The present value of exit, denoted by $VE(\mathbf{XE}_{it})$, is

$$VE(\mathbf{XE}_{it}) = E_\epsilon E_\xi \max\{VR(\mathbf{XE}_{it}) + \xi_{1it}, VW(\mathbf{XE}_{it}, \epsilon_i^W) + \xi_{2it}\}, \tag{12}$$

where ξ_{1it} and ξ_{2it} are stochastic components of the decision, drawn from type I extreme value distribution with scale parameter σ_S. Given the distributional assumption, the conditional probability of complete retirement, $d_{it} = 1$, has the logistic form for a given value of ϵ^W. It follows that

$$\begin{aligned} &\Pr(d_{it} = 1 \,|\, \mathbf{XE}_{it}) \\ &\quad = \int \frac{\exp(VR(\mathbf{XE}_{it})/\sigma_S)}{\exp(VR(\mathbf{XE}_{it})/\sigma_S) + \exp(VW(\mathbf{XE}_{it}, \epsilon_i^W)/\sigma_S)}\, dF(\epsilon_i^W). \end{aligned} \tag{13}$$

Exit Decision.—When making exit decisions, a judge considers his outside payoff, chance of reelection, and payoff from the seat. Hence, the relevant state variables $\mathbf{XC}_{it}$ are a combination of state variables for exit ($\mathbf{XE}_{it}$), variables that affect the reelection probability, and the preference type, T_i:

$$\mathbf{XC}_{it} = (T_i, \mathbf{XE}_{it}, Noncrime_i, Party_i, Dist_i, SOD_{it}, p_{it}, p_{it-1}).^{36} \tag{14}$$

Second Period of a Term: When the Seat Is Up for Reelection.—When a judge is up for reelection, he compares the value of running, *VRun*, with the value of voluntary exit, *VE*. *VRun* consists of the possibility of losing, which occurs with probability $(1 - WINP)$ and yields the value of outside options $VE(\mathbf{XE}_{it})$, and the possibility of winning, which occurs with probability *WINP*, and yields the value of being in the seat *VC*. Hence,

$$\begin{aligned} &VRun(\mathbf{XC}_{it}, p_{it}, p_{it-1}) \\ &\quad = \alpha_R + (1 - WINP(\mathbf{XR}_{it})) \times VE(\mathbf{XE}_{it}) + WINP(\mathbf{XR}_{it}) \\ &\qquad \times VC(T_i, \mathbf{XE}_{it+1}, Noncrime_i, Party_i, Dist_i, SOD_{it}), \end{aligned} \tag{15}$$

[35] The final age of life is set to be 100. Since the model starts at the age of 29, $T = 35$. δ is set to be $\delta = 0.90$ for a two-year period. As for the probability of death, we use the observed death rate at each age from the mortality data of the National Vital Statistics System. Regarding the retirement probability from the postexit job, we parameterize it as a logistic function of age and use the estimated parameter values from Diermeier, Keane, and Merlo (2005).

[36] When a judge is in the first period of a term, the state space does not include p_{it-1}.

where α_R is the payoff from running. The present value of holding office, evaluated at the point of the decision to run, is

$$EV(\mathbf{XC}_{it}, p_{it}, p_{it-1}) = E_{\xi} \max\{VRun(\mathbf{XC}_{it}, p_{it}, p_{it-1}) + \xi_{1it}, VE(\mathbf{XE}_{it}) + \xi_{2it}\}. \tag{16}$$

Given the type I extreme value distribution of ξ_{1it} and ξ_{2it}, the probability that a judge will choose to run has the logistic form as follows:

$$\Pr(c_{it} = Stay \,|\, \mathbf{XC}_{it}, p_{it}, p_{it-1}) = \frac{\exp(VRun(\mathbf{XC}_{it}, p_{it}, p_{it-1})/\sigma_S)}{\exp(VRun(\mathbf{XC}_{it}, p_{it}, p_{it-1})/\sigma_S) + \exp(VE(\mathbf{XE}_{it})/\sigma_S)}. \tag{17}$$

First Period of a Term: When the Seat Is Not Up for Reelection.—If a judge is in the first period of a term, he does not face reelection at the end of the period. Hence, he compares the present value of staying on the bench, *VC*, and the present value of voluntary exit, *VE*. The PV at the point of exit decision is

$$EV(\mathbf{XC}_{it}, p_{it}) = E_{\xi} \max\{VC(\mathbf{XC}_{it}) + \xi_{1it}, VE(\mathbf{XE}_{it}) + \xi_{2it}\}. \tag{18}$$

The probability that the incumbent will choose to stay on the bench is

$$\Pr(c_{it} = Stay \,|\, \mathbf{XC}_{it}, p_{it}) = \frac{\exp(VC(\mathbf{XC}_{it}, p_{it})/\sigma_S)}{\exp(VC(\mathbf{XC}_{it}, p_{it})/\sigma_S) + \exp(VE(\mathbf{XE}_{it})/\sigma_S)}. \tag{19}$$

Sentencing Decision.—Given the continuation value of the staying-running/exit decision, the value of each sentencing decision is straightforward. The PV of a sentencing decision $p_{it} = \hat{p}$ is[37]

$$V_{\hat{p}}(\mathbf{XC}_{it}) = W_B + \alpha_B + u(T_i, \hat{p}) + \delta(1 - \pi_d(Age_{it})) \cdot EV(\mathbf{XC}_{it}; p_{it} = \hat{p}), \tag{20}$$

where W_B, α_B, and $u(T_i, \hat{p})$ constitute the payoff from holding office in the current period, and $EV(\mathbf{XC}_{it}; p_{it} = \hat{p})$ is the expected present value of holding office, evaluated at the end of the term. The PV of being on the bench, evaluated at the beginning of a period, is

$$VC(T_i, \mathbf{XE}_{it}, Noncrime_i, Party_i, Dist_i, SOD_{it-1}) = E_{\zeta} \max_{\hat{p} \in \{H, SH, S, SL, L\}} \{V_{\hat{p}}(\mathbf{XC}_{it})\}. \tag{21}$$

[37] This formula is for the case in which a judge is in the first period of a term. When a judge is in the second period of a term, the only difference is that p_{it-1} should be included in the state vector.

The choice probability of a sentencing decision $p_{it} = \hat{p}$ is

$$\Pr(p_{it} = \hat{p} \,|\, \mathbf{XC}_{it}) = \frac{\exp(V_{\hat{p}}(\mathbf{XC}_{it})/\sigma_Z)}{\sum_p \exp(V_p(\mathbf{XC}_{it})/\sigma_Z)}. \tag{22}$$

B. *Likelihood Function*

When a judge is in the first period of a term, he first makes a sentencing decision, and then an exit decision. If he chooses to exit, then we observe the choice after exit, the likelihood of which is denoted by L_{it}^E. The likelihood of a sequence of choices in the first period of a term, L_{it}^1, is

$$\begin{aligned} L_{it}^1(\mathbf{XC}_{it}) = \Pr\{p_{it} \,|\, \mathbf{XC}_{it}\} \cdot \Pr(c_{it} = \mathit{Stay} \,|\, \mathbf{XC}_{it}, p_{it})^{I[c_{it}=\mathit{Stay}]} \\ \times \left[\Pr\{c_{it} = \mathit{Exit} \,|\, \mathbf{XC}_{it}, p_{it}\} L_{it}^E\right]^{I[c_{it}=\mathit{Exit}]}. \end{aligned} \tag{23}$$

When a judge is in the second period of a term, the seat is up for reelection. Denoting the reelection result by a dummy variable Lose_{it} ($\mathit{Lose}_{it} = 1$ when a judge loses the reelection bid), the likelihood of a sequence of choices in the second period of a term, L_{it}^2, is

$$\begin{aligned} &L_{it}^2(\mathbf{XC}_{it}, p_{it-1}) \\ &= \Pr\{p_{it} \,|\, \mathbf{XC}_{it}, p_{it-1}\} \times \left[\Pr\{c_{it} = \mathit{Stay} \,|\, \mathbf{XC}_{it}, p_{it-1}, p_{it}\}\right. \\ &\qquad \cdot \left\{(1 - \mathit{Lose}_{it}) \cdot \mathit{WINP}(\mathbf{XR}_{it})\right. \\ &\qquad \left.\left. + \mathit{Lose}_{it} \cdot (1 - \mathit{WINP}(\mathbf{XR}_{it}))L_{it}^E\right\}\right]^{I[c_{it}=\mathit{Stay}]} \\ &\times \left[\Pr\{c_{it} = \mathit{Exit} \,|\, \mathbf{XC}_{it}, p_{it}, p_{it-1}\} L_{it}^E\right]^{I[c_{it}=\mathit{Exit}]}. \end{aligned} \tag{24}$$

Finally, by combining the sequence of observations and integrating over the possible preference types, the contribution of an individual i who entered in period t_0 and was in the court for t_i periods is

$$L_i = \sum_{T_i} \Pi_{t=t_0}^{t_0+t_i-1} L_{it}(T_i) \cdot \Pr(T_i). \tag{25}$$

C. *Identification*

In this subsection, we discuss several issues concerning the identification of the model. We start by providing the main intuition for why preference heterogeneity and reelection incentives are separately identified and then discuss details.

The influence of reelection incentives is identified from the variation in sentencing decisions across two dimensions: judges' potential outside payoff and their electoral vulnerability. Judges' potential outside payoff generates variation in judges' stake in reelection and, hence, creates variation in the incentive to appeal to voters through court decisions. Specifically, the outside payoff provides sources of identification through two different channels. First, judges' career history, incorporated in the wage from off-bench legal occupation, provides variation in incentives across judges. Second, it also contains two variables, age and tenure, which vary over time and affect eligibility and pension amount.[38] Judges' electoral vulnerability changes stochastically over time as voters' preferences for their party change.

The sentencing preference of judges is identified from the decision patterns when their reelection concerns are relatively small, i.e., when the reelection probability is high or the stake in the reelection is small. For example, if a judge makes a Harsh decision when the political climate is favorable to his party or he is in the late stage of his career, he is likely to have a harsh sentencing preference. In sum, the dynamics of sentencing relative to changes in political climate and the variation in judges' sentencing across different stages of their career play an important role in the separate identification of a judge's preference and reelection incentives.[39]

Let us now consider the identification of reelection probability and key structural parameters of the model. A key issue in the identification of reelection probability is that judges' sentencing behavior is endogenous. A judge who is popular among voters, for reasons unobservable to the econometrician, may feel safe making unpopular sentencing decisions, which causes bias in estimating the effect of sentencing behavior on reelection probability. To overcome this problem, we use variation in judges' potential outside payoff discussed above as a source of identification. Such information is costly for voters to acquire, and this is unlikely to affect reelection probability. However, it affects judges' incentives to get reelected. Figure 6 shows the relationship between elected judges' stake in reelection and their sentencing behavior. To obtain this figure, we first compute the difference between the present values of being in the court and of the outside options. We divide judge-period observations into two groups: "high-stake" group (for whom the difference is above median) and "low-stake" group (for whom the difference is below median).[40] Judges with a high stake have a strong incentive to appeal to voters. Figure 6 shows that elected judges in the high-stake group are more likely to sentence Standard decisions in conservative districts and Lenient decisions in liberal districts.

Another issue concerns the identification of the payoff from holding office and the utility function parameters. The identification of the nonpecuniary benefit α_B hinges on three elements: the wage from the seat, the prospective outside payoff, and the patterns of exit decisions. The wage from the seat on the bench is given,

[38] The complex functional form of the pension, in conjunction with cohort, which is not included in the reelection probability function, helps with the identification.

[39] Here, dividing a term to two periods helps to strengthen the power of political climate as a source of identification for sentencing preference, by increasing the observations of the relationship between political climate and the sentencing behavior.

[40] For Figure 6, we use a simplified present discounted value of staying/exiting options that include only pecuniary payoffs (wage from the bench, pension, projected wage from outside legal occupation) excluding any nonpecuniary payoffs, taste shocks, or decisions in the subsequent periods. Hence, the documentation in Figure 6 is not dependent on any particular modeling decision or estimated parameter values of the model.

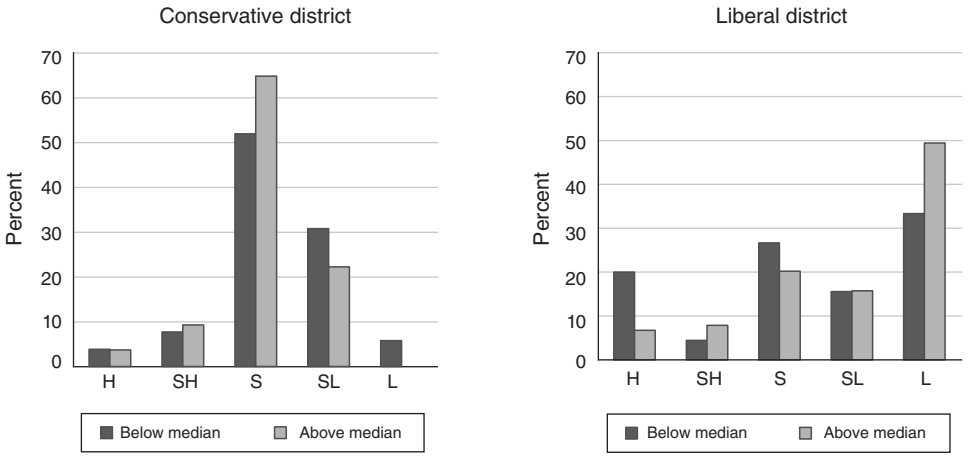

FIGURE 6. STAKE IN REELECTION AND SENTENCING BEHAVIOR OF ELECTED JUDGES

and the prospective outside payoff is derived from the post-exit wage equation, the pension rule, and each judge's career history. These elements together determine a judge's streams of *monetary* payoffs from the seat on the bench and from outside options. Then, the discrepancy between the pattern of exit decisions in the data and those predicted from the two different streams of *monetary* payoffs is attributed to the nonpecuniary payoff from the seat.

Once the nonpecuniary payoff from the seat is identified, the utility function parameters are identified from the combination of three different elements: the reelection probability function, the stream of outside payoffs, and the stream of payoffs from the seat (gross of pecuniary and nonpecuniary payoffs). The difference between the two streams of payoffs defines the "size of the stake" in the reelection of each judge, in dollar terms. Since the reelection probability is a function of sentencing decisions in the court, the impact of each court decision on a judge's long-term payoff can be derived from the reelection probability function and the stake in the reelection. The parameters of the utility function are identified from the difference between the pattern of court decisions predicted purely by the long-term value of each decision and the pattern observed in the data.[41] Since the nonpecuniary payoff unrelated to sentencing decisions is already included in the payoff from the seat, the payoff from a judge's most preferred sentencing decision is normalized to be zero.

Finally, consider the identification of judges' preference distribution. In principle, judges' sentencing preferences are nonparametrically identified, and we can allow for a continuum of preference types. But incorporation of a continuum substantially

[41] In the specification of the utility from sentencing decisions, there are two parameters that determine the shape of the function: γ and σ_u. γ is identified from the overall variability of judges' decisions across different political climates and different stages of their career. If γ is large, then the disutility incurred by deviating from the bliss point is big, and we should observe sentencing not to change very much with the political climate. On the other hand, if γ is small, then we should observe higher sentencing variability. On the other hand, σ_u is identified from the rate of changes in utility that is not captured by γ. When γ is large, it not only makes the curvature of the utility function around the bliss point large, but it also makes the overall range of the utility function large. In contrast, σ_u affects the curvature of the utility function around the bliss point, but it does not affect the overall range of the utility function.

increases the computational cost. Moreover, the raw sentencing decisions are concentrated around minimum, maximum, and standard decisions specified by the sentencing guidelines. Hence, reduction of the preference type space to three or five types is a reasonable simplification. For simplicity of the state space, we first reduced the type space to three types. Since the model has good performance in fitting the major features of the data, we do not expand it to five types. The bliss point of the standard type, x_S^*, is identified by the asymmetry in the sentencing distribution. The model is completely symmetric; hence, any sentencing heterogeneity would also be symmetric if x_S^* were equal to one half.

V. Estimation Results

In this section, we summarize the main estimation results. First, we report the results for the following components of the model: the reelection probability, the payoffs from a seat on the bench and from sentencing decisions, and the preference type distribution. Second, we report the performance of the model in terms of goodness of fit. Third, we discuss the results. The maximum likelihood estimates and standard errors of the model parameters are reported in Section A of the Appendix.

A. *Reelection Probability*

The reelection probability of elected judges shows several interesting features.

Party Affiliation.— For elected judges, an important factor that affects reelection probability is the combination of party affiliation and political climate. Table 4 summarizes the average reelection probability of elected judges under six different combinations of party affiliation and political climate, based on our estimates.

An interesting aspect of the effect of party affiliation is the asymmetry between Democrats and Republicans. When a judge is a Democrat, the maximum effect of political climate on the reelection probability is 8.1 percentage points, while it is more than 20 percentage points when a judge is a Republican. This is perhaps due to the fact that Kansas is a deep-red state. As shown in Table 2, liberal districts are composed of half Democrats and half Republicans, while conservative districts are predominantly Republican. Overall, the incumbent Democratic judges were elected under a political climate unfavorable to their party. This suggests that they have high valence characteristics (charisma, good looks, etc.) which makes them less vulnerable to the political climate.[42]

Sentencing Decision.— For elected judges, the effect of sentencing decisions critically depends on the political orientation of their districts. Not only do voters' preferences over sentencing decisions differ, but the magnitude of the effect also varies. In conservative districts, the most preferred decision is Standard, and Lenient is least preferred. Further, the sentencing decision has a substantial impact on the

[42] Even though an asymmetry in political climate classification existed, it did not contribute to the asymmetry between parties in reelection probability. Even when we classify the political climate in the opposite asymmetric way, elected Democrats show strong stability in reelection across political climates.

TABLE 4—ESTIMATED AVERAGE REELECTION PROBABILITY OF ELECTED JUDGES (*percent*)

Political climate	Democrat	Republican
Favorable to Republican	90.3	93.8
Neutral	91.7	95.5
Favorable to Democrat	98.4	70.2

reelection probability. In liberal districts, Lenient is most preferred, and Harsh is least preferred, and the effect of sentencing on reelection is much smaller. Table 5 shows the average negative effect on the reelection probability when an elected judge changes his sentencing decision from the one most preferred in the district to the least preferred.

Table 5 also illustrates a substantial disparity between Democrat and Republican judges in the effect of their sentencing on reelection. In both conservative and liberal districts, the marginal effect of sentencing decisions is larger for Republicans. There are two possible reasons for this. First, the Republican party is much larger than the Democratic party in Kansas, which probably means the variability of Republicans' ideology is larger than that of Democrats. This in turn may make voters' initial information about Republicans much less precise than their information about Democrats.[43] This difference in the initial amount of information could lead to a difference in the sensitivity of voters to judges' decisions. Second, as we argued earlier, Democratic judges are likely to have higher valence characteristics. Such a disparity could cause a difference in the marginal effect of sentencing behavior on reelection.

These two reasons may also explain the sentencing patterns across parties, documented in Section IIB, that elected Republicans are not harsher than Democrats. While elected Democrats serve primarily in liberal districts, where they have little incentive to appeal to voters, Republicans are spread out across districts. In such cases, the strong incentive for the Republicans in more liberal districts to appeal to voters with lenient sentencing outweighs their predisposition to be harsh in sentencing.

B. *Payoff from a Seat on the Bench*

The estimated nonpecuniary benefit, α_B, that judges receive from a seat over a two-year period is \$174,878.[44] Since judges' wage for a two-year period is around \$200,000, the nonpecuniary benefit is comparable to about 85 percent of the wage. Regarding sentencing decisions, the payoff for each preference type of judge from each sentencing option (in dollar terms) is summarized in Figure 7. The loss of payoff that each preference type incurs by deviating from his most preferred decision varies substantially across types. A standard type judge incurs a substantial loss of payoff from making decisions that are not Standard. On the other hand, a harsh or lenient type judge experiences a much smaller loss of payoff from deviating from

[43] A simple model in which voters have uncertain information about judges' ideology and do Bayesian updating based on judges' decisions yields a positive relationship between the variance of judges' ideology and the magnitude of the effect of judges' decisions.

[44] All numbers expressed in dollar terms in this study are in 2005 US dollars.

TABLE 5—IMPACT OF SENTENCING DECISIONS ON REELECTION PROBABILITY OF THE ELECTED
(*percentage point*)

	Conservative district	Liberal district
Democratic judges	−17.0	−0.0
Republican judges	−33.8	−22.8

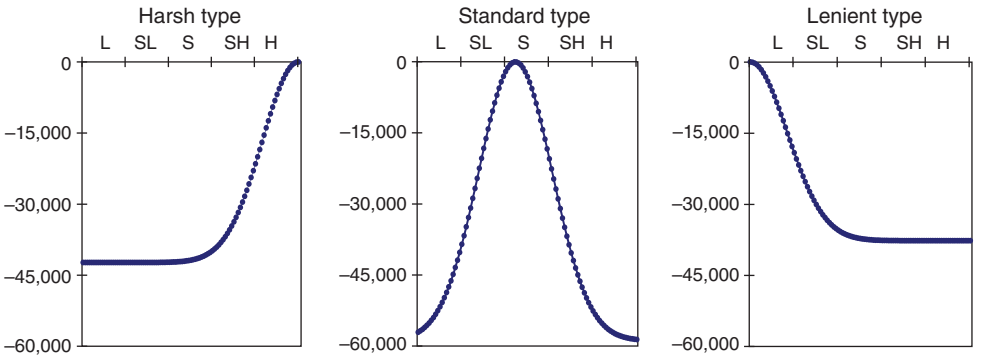

FIGURE 7. PAYOFF FROM SENTENCING DECISIONS FOR EACH PREFERENCE TYPE

his most preferred decisions. The estimated payoff in Figure 7 implies that standard types care greatly about abiding to the law very strictly, while harsh and lenient types are much less rigid.

C. *Estimated Preference Type Distribution*

Figure 8 shows the estimated preference type distribution for four different groups of judges. The distribution exhibits an intriguing feature: the proportion of the standard preference type is significantly higher among appointed than elected judges, yielding a substantial homogeneity among appointed judges. By contrast, the distribution of elected judges' preference shows much larger variation. This feature reveals a substantial difference in the functioning of the two systems with respect to the initial selection process, which will be discussed in Section VE. It also indicates that the substantial difference in judges' behavior under the two systems, observed in Figure 2, can be attributable to the underlying preference distribution of judges selected under the two systems, as well as the difference in reelection processes. This will be discussed further in Section VIA.

D. *Goodness of Fit*

To assess the performance of our model, we compare its main predictions to their empirical counterparts in the following dimensions: (i) the distribution of sentencing decisions when judges are appointed and elected, (ii) the distribution of elected

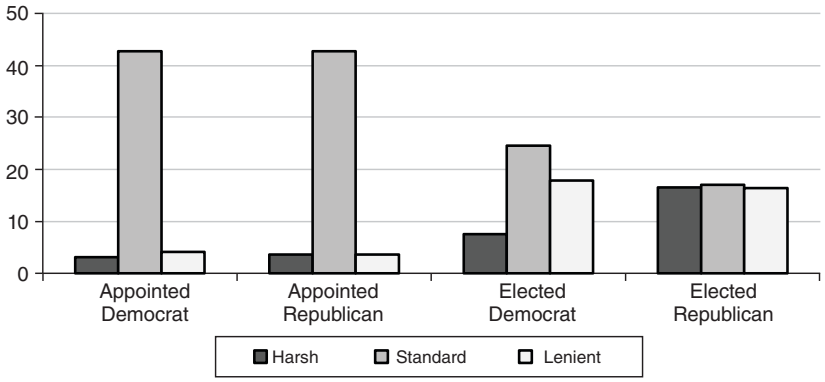

FIGURE 8. ESTIMATED PREFERENCE TYPE DISTRIBUTION

judges' sentencing decisions across the political orientation of districts, (iii) the distribution of elected judges' sentencing decisions across parties, (iv) voluntary exit rates across age groups for appointed and elected judges, and (v) the relationship between the size of the stake in reelection and decision patterns. Table 6 shows that our model has good performance in fitting the major patterns of sentencing decisions. Specifically, in columns 1 and 2, it predicts the main pattern in the data that appointed judges have a much higher proportion of Standard decisions than elected judges. In columns 3 and 4, the model predicts the substantial difference in relative frequency of Lenient decisions between conservative and liberal districts. In columns 5 and 6, our model fits the overall difference between the parties fairly well.

Turning to exit rates, Table 7 shows the predictions of the model for appointed and elected judges across age groups. A pattern in the data is that the exit rate before the age of 50 is relatively low, and this is well predicted by the model. In the data, the exit rate of elected judges is higher than appointed judges for all age groups, which is also predicted by the model.

Finally, Table 8 compares sentencing patterns for high and low reelection stakes. We define the stake in reelection as the difference between the PV of being in office and that of outside options, as in Figure 6. The classification employed for Table 8 is identical to that of Figure 6. Table 8 shows that the model has good performance in predicting that elected judges in the high-stake group are more likely to make Standard sentencing decisions in conservative districts and Lenient sentencing decisions in liberal districts.

E. *Discussion*

Preference Type Distribution.— A notable feature of the results is the concentration of the preference type of appointed judges in the center. This suggests that gubernatorial appointment, as a selection process, differs substantially from direct election. Conceptually, there are four main reasons why the two systems may lead to selection of different preference types of judges. First, gubernatorial appointment causes *centralization* of selection processes. Since a governor is selected by all

TABLE 6—GOODNESS OF FIT: RELATIVE FREQUENCY OF SENTENCING DECISIONS (*percent*)

	Appointed (1)		Elected (2)	
Decision	Data	Model	Data	Model
H	7.4	7.9	9.8	8.9
SH	8.9	10.6	7.0	7.1
S	47.8	46.7	36.5	37.7
SL	24.8	25.7	19.7	19.8
L	11.2	9.2	27.0	26.6

	Elected (by district)			
	Conservative (3)		Liberal (4)	
Decision	Data	Model	Data	Model
H	3.8	4.7	13.4	11.6
SH	8.5	4.3	6.2	8.8
S	58.5	60.6	23.5	23.0
SL	26.4	24.7	15.6	16.6
L	2.8	5.7	41.3	40.0

	Elected (by party)			
	Democrat (5)		Republican (6)	
Decision	Data	Model	Data	Model
H	14.2	11.9	6.7	6.1
SH	8.3	10.1	6.1	4.3
S	34.2	37.0	38.2	38.3
SL	24.2	22.0	16.4	17.8
L	19.2	19.1	32.7	33.5

voters in a given state, when judges are appointed by the governor, the ideology of the median voter in the entire state, rather than local preferences, should be reflected in the selection procedure.[45] Hence, gubernatorial appointment may yield a very homogeneous group of judges. The second possible reason is *issue-bundling* in gubernatorial election, as theorized by Besley and Coate (2003). In most gubernatorial elections, judicial appointment is not a primary issue. And issue-bundling enables governors to select judges whose preferences are not close to the preference of local voters. In other words, issue-bundling may strengthen the consequences of centralization, by making the governor choose judges having preferences similar to his own rather than selecting judges catering to district-specific preferences. The third reason is the possible influence of judicial nominating commissions. In most states where judges are appointed, including Kansas, there is typically a judicial

[45] This mechanism does not require that judicial appointment be a major issue in gubernatorial elections. As long as there is a correlation between major issues in gubernatorial elections (e.g., government spending) and their views on crime, this still results in appointed judges' preferences being concentrated at the center. Although we do not provide evidence that the median voter in Kansas has the standard preference type, it is reasonable to assume it for the following reason. The state criminal law is legislated by the state legislature which represents the preference of the state. The estimation result shows that the bliss point of the standard type is around the standard prison time in the sentencing guidelines. Therefore, the standard preference type can be regarded as the preference of the median voter in the state.

TABLE 7—GOODNESS OF FIT: VOLUNTARY EXIT RATES BY AGE (*percent*)

	Appointed		Elected	
Age-group	Data	Model	Data	Model
Under 40	0.0	0.1	3.1	0.6
41–50	0.7	0.2	1.1	0.9
51 or older	6.8	7.3	8.9	8.5

TABLE 8—GOODNESS OF FIT: SENTENCING PATTERNS BY THE SIZE OF THE STAKE IN REELECTION (*percent*)

	Elected, conservative districts				Elected, liberal districts			
	Below median		Above median		Below median		Above median	
Decision	Data	Model	Data	Model	Data	Model	Data	Model
H	3.9	7.9	3.7	2.7	20.0	12.8	6.7	10.5
SH	7.7	6.3	9.3	3.1	4.4	9.7	7.9	8.0
S	51.9	51.5	64.8	66.2	26.7	24.6	20.2	21.5
SL	30.8	25.4	22.2	24.3	15.6	17.9	15.7	15.5
L	5.8	8.8	0.0	3.8	33.3	35.0	49.4	44.6

nominating commission that is composed of an equal proportion of lawyers and nonlawyers. If lawyers have a stronger preference for uniformity in court decisions than voters do, gubernatorial appointment may yield a more homogeneous body of judges than popular elections would. The fourth possible reason is the large amount of information that the governor and nominating commission have about judicial candidates, relative to voters. Voters are unlikely to be well informed about the characteristics and political ideology of judicial candidates newly running for election. This informational difference is likely to produce homogenous preferences of appointed judges and a highly variable preference distribution of elected judges.

Advantages and Disadvantages of Each System.— The main sentencing patterns in the data and the estimation results together have the two following implications. First, the main difference between appointment and election systems is in whether *heterogeneity in voter preferences* across jurisdictions is reflected in policy outcomes, rather than the *degree* to which the preference of the relevant constituency is reflected in policy outcomes. In other words, the primary difference between the two systems is in *whose preference is reflected* in policy outcomes (whether it is the preference of the median voter in the entire state or the voter preference of local jurisdictions) rather than *how strongly it is reflected*. Second, although both appointment and election are fairly effective in attaining congruence between policy outcomes and the preference of the relative constituency, the mechanism is completely different. In the appointment system, *selection on preferences* is the primary determinant of policy outcomes. In contrast, in the election system, *reelection incentives* play a crucial role in attaining policy congruence. This second implication leads us to the following question: what are the determinants of the effectiveness of reelection incentives? Specifically, how does the effectiveness of the election system depend on characteristics of the job, in particular, payoffs from being in

office? This question is important in drawing general conclusions about the relative advantages of each system, because payoffs from holding office differ widely across public offices. Moreover, reelection incentives may have unintended consequences of discouraging public officials with good outside options from staying in office, by decreasing the value of holding office. These issues, which should be an integral part of assessing the advantages and disadvantages of each system, will be analyzed in counterfactual experiments of changing payoffs from holding office (Section VIB).

VI. Counterfactual Experiments

A. *Alternative Combination of Preferences and Reelection Incentives*

One of the primary objectives of this study is to understand the influence of selection on preferences and reelection incentives on sentencing behavior under the two systems. For this purpose, we conduct two counterfactual experiments.[46]

(i) Elimination of reelection incentives: we simulate a situation in which elected judges are life tenured.

(ii) Replacement of elected judges' preferences with appointed judges': we simulate a situation in which appointed judges face the reelection process of elected judges.

Table 9 shows the sentencing patterns under the two simulations (the first column and the third column of each panel) along with the baseline sentencing patterns of elected judges (the second column of each panel) and appointed judges (the right-most column).[47] The results from simulation (i) show a substantial change in elected judges' behavior. For judges in conservative districts, removing reelection incentives substantially decreases the proportion of Standard decisions. For judges in liberal districts, the proportion of Lenient decisions is decreased by half. On the other hand, the results from simulation (ii) show that the difference in preference between appointed and elected judges is also an important factor in explaining the difference in the sentencing behavior under the two systems. For example, the relative frequency of appointed judges' Lenient decisions in liberal districts is substantially lower than that of elected judges, because appointed judges' sentencing preferences are concentrated on the Standard type.

In the last panel, we measure the variability of sentencing behavior under each situation using Simpson's diversity index.[48] Since simulation (ii) and the baseline model of appointed judges have the same preference (of appointed judges) while they differ in reelection incentives, the difference between the two shows *the*

[46] Exactly how we conduct the counterfactual experiments is described in Section 6 of the online Appendix.

[47] Since the difference in appointed judges' behavior between conservative and liberal districts is negligible, we do not report the two separately.

[48] Simpson's diversity index defined as $D = \sum_{i=1}^{S} p_i^2$, in which S is the number of categories ($S = 5$), and p_i is the relative frequency of each category. Note that D decreases in diversity, with 1 representing no diversity. The mathematical definition of Simpson's diversity index is identical to that of the Herfindahl-Hirschman Index that economists are familiar with.

TABLE 9—SENTENCING PATTERNS UNDER ALTERNATIVE PREFERENCES AND REELECTION INCENTIVES (*percent*)

	Conservative district			Liberal district		
Preference Retention	Simulation (a) Elected Life tenured	Baseline Elected Reelection	Simulation (b) Appointed Reelection	Simulation (a) Elected Life tenured	Baseline Elected Reelection	Simulation (b) Appointed Reelection
H	20.5	4.7	3.9	17.6	11.6	7.8
SH	12.1	4.3	4.0	11.5	8.8	8.0
S	26.9	60.6	63.3	29.2	23.0	32.4
SL	19.1	24.7	24.7	20.1	16.6	19.7
L	21.4	5.7	4.2	21.6	40.0	32.2

	Overall			
Preference Retention	Simulation (a) Elected Life tenured	Baseline Elected Reelection	Simulation (b) Appointed Reelection	Baseline Appointed Life tenured
H	18.7	8.9	6.2	7.9
SH	11.7	7.1	6.4	10.6
S	28.3	37.7	44.5	46.7
SL	19.7	19.8	21.6	25.7
L	21.6	26.6	21.2	9.2
Simpson index	0.214	0.265	0.298	0.310

influence of reelection incentives on the variability of sentencing behavior. On the other hand, the baseline model of elected judges and simulation (ii) have the same reelection incentives (of elected judges), but they differ in the preference distribution. Hence, the difference between the two shows *the influence of judges' preferences*. When we compare the baseline model of appointed judges with simulation (ii), the Simpson index decreases by 0.012 point. When we compare simulation (ii) with the baseline model of elected judges, the Simpson index decreases by 0.033 point. Therefore, judges' preferences explain 73 percent ($= 0.033/0.045$) of the total difference in sentencing variability between elected and appointed judges. This implies that the variability of preferences, as well as reelection incentives, is an important determinant of differences in policy outcomes under the two selection systems.

B. *Policy Outcomes and Sorting under Alternative Payoff Configurations*

In this subsection, we conduct various counterfactual experiments in which we change the size of pecuniary and nonpecuniary benefits from holding office. We document how such changes affect policy outcomes and sorting of public officials based on career history and preferences. This exercise is important for understanding how the advantages and disadvantages of each selection system are affected by job characteristics. In particular, we address the following questions: (i) if we change the salary level of elected public officials, to what extent does it affect congruence between policy outcomes and voter preferences? (ii) Under a hypothetical situation in which the nonpecuniary benefit is small, to what extent does a salary change for elected public officials affect policy congruence? And (iii) to what extent

does a salary change in the above two situations affect choices by public officials with a high level of human capital or noncongruent policy preference to hold office? To answer these questions, we conduct the following eight simulations:

(a) changes in salary under baseline nonpecuniary benefit (four simulations): 50 percent reduction, 25 percent reduction, 25 percent increase, and 50 percent increase in salary with no change in nonpecuniary benefit

(b) changes in salary combined with 25 percent reduction in nonpecuniary benefit (2 simulations): 25 percent reduction and 25 percent increase in salary, both combined with 25 percent reduction in nonpecuniary benefit

(c) changes in salary combined with elimination of nonpecuniary benefit (two simulations): 25 percent reduction and 25 percent increase in salary, both combined with no nonpecuniary benefit.

Before we present our results, one caveat is in order. Since we use only the data on judges (as opposed to a pool of lawyers), our analysis is conditional on already being on the bench. When we change the payoff from holding office, it would naturally affect the pool of lawyers who desire to enter the bench, which is not addressed in our analysis. Nevertheless, our analysis has implications that are useful in thinking about the interaction between payoffs, policy outcomes and sorting of public officials.

Table 10 shows the policy choice by elected judges in conservative (panel A) and liberal districts (panel B) under eight different configurations of payoffs. There are two clear patterns. First, the congruence between policy outcomes and voter preferences is higher when the salary level is higher. For example, when we compare the result of 25 percent reduction ("25 percent less") and 25 percent increase ("25 percent more") in salary in conservative districts under simulation (a), the proportion of Standard decisions is 8.4 percentage points higher under the latter. Although the positive relationship between payoffs from holding office and policy congruence is theoretically straightforward, the magnitude of the effect critically depends on two factors—the rigidity of judges' preference on sentencing decisions and the sensitivity of the reelection probability function. For example, if judges have rigid preferences on sentencing and the reelection probability function is very sensitive, then a decrease in payoffs would not lead to a substantial change in the degree of policy congruence. It is because judges would follow their preference regardless of payoffs from holding office and judges whose preferences are not congruent with voters' would fail in reelection. In the case of the judges that we consider in this analysis, payoffs from holding office have a substantial influence on policy congruence, because the judges have relatively flexible preferences, i.e., the judges' disutility from deviating from their own preference is relatively small compared with payoffs from holding office, and the sensitivity of the reelection probability is moderate.

The second pattern is that the marginal effect of a salary increase becomes larger when the overall payoff level is lower. For example, under simulation (c) in which there is no nonpecuniary payoff, the difference between the two simulations ("25 percent

TABLE 10—POLICY OUTCOMES UNDER ALTERNATIVE CONFIGURATION OF PAYOFFS

Panel A. Elected judges in conservative districts

		Simulation (a)			
	Baseline	50 percent less	25 percent less	25 percent more	50 percent more
H	4.7	9.4	6.5	3.8	3.4
SH	4.3	6.3	5.1	3.7	3.0
S	60.6	49.8	55.3	63.7	68.0
SL	24.7	24.3	25.6	24.0	21.9
L	5.7	10.2	7.4	4.7	3.8

	Simulation (b)		Simulation (c)	
	25 percent less	25 percent more	25 percent less	25 percent more
H	8.2	4.6	14.9	9.0
SH	5.9	4.2	10.0	6.6
S	51.5	61.9	33.8	49.7
SL	24.4	23.6	23.3	24.2
L	10.0	5.8	18.0	10.6

Panel B. Elected judges in liberal districts

		Simulation (a)			
	Baseline	50 percent less	25 percent less	25 percent more	50 percent more
H	11.6	13.8	12.7	11.0	10.2
SH	8.8	9.9	8.8	8.0	7.9
S	23.0	26.0	24.6	22.1	21.5
SL	16.6	18.6	17.7	16.4	15.7
L	40.0	31.7	36.2	42.5	44.7

	Simulation (b)		Simulation (c)	
	25 percent less	25 percent more	25 percent less	25 percent more
H	13.9	11.5	16.8	14.0
SH	9.8	8.4	11.2	9.7
S	25.1	22.6	28.5	26.0
SL	18.4	16.5	18.7	19.1
L	32.8	41.0	24.7	31.1

less" and "25 percent more") in the proportion of Standard decision is 15.9 percent, which is about twice as large as the difference under simulation (a). When the payoff from the seat is substantially large, the difference between the PV of being in office and the PV of the exit option is high for all the groups of judges. Therefore, most judges already follow voter preferences, which makes the marginal effect of a salary increase small. In contrast, when the payoff from the seat is small, most judges follow their own preferences in making policy decisions. Hence, a salary increase would induce a large proportion of judges to change their behavior to appeal to voters.

These two features have the following implications. First, the influence of reelection incentives on policy outcomes may be much weaker for other public offices such as regulators or school boards that offer smaller payoffs than the judiciary. Since policy congruence under the appointment system hinges entirely on selection based

on preferences, it would not be affected much by payoffs. Therefore, the election system may be relatively less effective in attaining policy congruence, depending on payoffs from holding office. Second, if the government can pay only low salaries, the detrimental effect on policy outcomes will be larger for public offices having low prestige.[49]

Next, Table 11 shows the influence of alternative payoff configurations on sorting based on career history among judges who exit from the job for five different groups. The table shows that the influence of salary on sorting is much larger for elected than appointed judges. For example, under simulation (a) and among Democrats in conservative districts who exit from office, the difference between "50 percent less" and "50 percent more" in the proportion of judges with more than 10 years of experience among those who exit is 22.8 $(= 87.7 - 64.9)$ percentage points. By contrast, it is 3.9 percentage points among appointed judges. This result indicates that reelection incentives may potentially have a perverse effect on the human capital level of public officials through sorting.

When the salary level is high, those who leave the job are mostly judges with good outside options. In contrast, when salary is low, even judges whose exit option is not great may want to leave the job. Therefore, salary reductions increase the proportion of judges having a short career history among those who exit. The above result implies that reelection concerns magnify this effect. This is because when judges have strong reelection concerns, it decreases the PV of being in office, which in turn leads to a small difference between PV of being in office and the exit option. In brief, the overall welfare level of elected judges is much lower. Therefore, a salary decrease would induce a large proportion of elected judges to leave office. On the other hand, appointed judges enjoy high welfare level from being in office, due to the absence of reelection concerns. The welfare level of appointed judges would still be high after a salary decrease, leading them to choose to stay in office.

This observation has potentially important implications for the design of incentive schemes for public officials in general. For certain public offices for which high turnover (frequent exit of incumbents) is a concern, reelection incentives may have the perverse effect of decreasing the overall level of human capital. In contrast, the appointment system, which hinges entirely on selection based on preferences, may be effective in simultaneously attaining policy congruence and a high level of public officials' human capital.

Lastly, Table 12 shows the distribution of preferences among judges who exit from the job. Theoretically, a salary decrease may induce judges whose preferences are not congruent with voters' to leave the job. Table 12 shows that sorting based on preference, which is theoretically plausible, has only a very small magnitude. This is because the payoff differential between the job and the exit option is large to the extent that most judges want to keep the job even when their

[49] Although overall payoffs from holding office, gross of nonpecuniary benefit, cannot usually be measured in a straightforward manner, we can usually make a rough inference about it from the turnover rate. Typically, jobs with large payoffs have relatively low voluntary turnover, while jobs with small payoffs show high voluntary turnover rate.

TABLE 11—DISTRIBUTION OF THE CAREER HISTORY OF JUDGES WHO EXIT FROM COURTS UNDER ALTERNATIVE CONFIGURATIONS OF PAYOFFS (*percent*)

	Number of years in law practice	Baseline	Simulation (a)			
			50 percent less	25 percent less	25 percent more	50 percent more
Appointed	≤ 10	13.7	18.1	14.4	13.6	14.2
	> 10	86.4	81.9	85.6	86.4	85.8
Elected						
Democrats in	≤ 10	12.3	35.1	21.2	16.0	12.4
conservative districts	> 10	87.7	64.9	78.8	84.0	87.7
Republicans in	≤ 10	20.8	28.3	26.5	24.4	19.8
conservative districts	> 10	79.2	71.8	73.5	75.6	80.2
Democrats in	≤ 10	36.7	38.5	34.9	32.8	37.8
liberal districts	> 10	63.3	61.5	65.1	67.2	62.2
Republicans in	≤ 10	41.8	39.6	40.3	39.2	34.2
liberal districts	> 10	58.2	60.4	59.7	60.8	65.9

		Simulation (b)		Simulation (c)	
		25 percent less	25 percent more	25 percent less	25 percent more
Appointed	≤ 10	18.1	15.3	26.4	20.7
	> 10	82.0	84.7	73.6	79.3
Elected					
Democrats in	≤ 10	30.1	20.2	33.6	28.6
conservative districts	> 10	69.9	79.8	66.4	71.4
Republicans in	≤ 10	30.6	24.4	34.6	28.2
conservative districts	> 10	69.4	75.6	65.4	71.8
Democrats in	≤ 10	39.7	36.9	42.9	40.1
liberal districts	> 10	60.3	63.1	57.1	59.9
Republicans in	≤ 10	40.3	38.4	41.5	39.8
liberal districts	> 10	59.7	61.6	58.5	60.2

preference is not congruent with the voters'.[50] The smallness of sorting based on preferences in exit decisions is also consistent with the first result of the simulations (the sensitivity of policy congruence to payoffs). Suppose that, contrary to our results, a decrease in payoffs induces noncongruent public officials to leave office. Then, it would mitigate the negative effect of a decrease in payoffs on policy congruence. On the other hand, if such sorting takes place to only a small degree, then judges with noncongruent preferences will stay in office, and they will make policy decisions that are not favored by voters.

To summarize, we get the following conclusions from our simulations of changing payoffs from holding office: (i) even when reelection probability is sensitive to incumbents' behavior, the effect of reelection incentives on policy outcomes can be moderate if the job does not provide enough payoffs (e.g., if the job is not very prestigious); (ii) reelection incentives may have the perverse effect of decreasing the human capital level of public officials, through sorting based on career history in

[50] We find similar patterns under simulation (c) in which there is no nonpecuniary benefit. This feature needs to be interpreted somewhat differently. The simulation is based only on exit, and all types would want to exit anyway if the payoff from the job is substantially low.

TABLE 12—PREFERENCE DISTRIBUTION OF JUDGES WHO EXIT FROM COURTS UNDER ALTERNATIVE CONFIGURATIONS OF PAYOFFS (*percent*)

			Simulation (a)			
	Preference type	Baseline	50 percent less	25 percent less	25 percent more	50 percent more
Appointed	Harsh	7.0	7.5	7.3	6.9	6.4
	Standard	83.8	83.7	84.0	85.4	85.6
	Lenient	9.2	8.8	8.8	7.7	8.0
Elected						
Democrats in conservative districts	Harsh	16.4	15.6	19.2	19.0	17.3
	Standard	45.1	48.4	45.2	48.0	43.2
	Lenient	38.5	36.0	35.6	33.0	39.5
Republicans in conservative districts	Harsh	34.4	36.0	32.7	31.3	37.6
	Standard	31.5	30.5	32.2	32.5	31.0
	Lenient	34.1	33.5	35.1	36.2	31.5
Democrats in liberal districts	Harsh	14.8	14.4	14.9	15.6	11.8
	Standard	50.1	51.2	50.9	50.3	52.1
	Lenient	35.1	34.4	34.3	34.1	36.1
Republicans in liberal districts	Harsh	31.4	34.0	31.5	34.2	36.6
	Standard	41.5	37.3	36.8	34.2	31.7
	Lenient	27.1	28.8	31.7	31.7	31.7

		Simulation (b)		Simulation (c)	
		25 percent less	25 percent more	25 percent less	25 percent more
Appointed	Harsh	7.8	7.8	6.9	7.1
	Standard	83.7	83.3	85.2	85.0
	Lenient	8.5	9.0	8.0	7.9
Elected					
Democrats in conservative districts	Harsh	16.8	21.0	15.1	15.7
	Standard	43.8	49.2	49.2	47.1
	Lenient	39.4	29.8	35.6	37.3
Republicans in conservative districts	Harsh	37.5	31.8	31.7	35.7
	Standard	29.6	34.3	35.0	32.7
	Lenient	32.9	34.0	33.3	31.6
Democrats in liberal districts	Harsh	13.1	16.0	15.1	14.2
	Standard	52.0	47.7	49.0	50.1
	Lenient	34.9	36.3	35.9	35.7
Republicans in liberal districts	Harsh	34.0	32.8	33.7	34.3
	Standard	33.7	34.1	34.5	33.3
	Lenient	32.3	33.1	31.8	32.4

exit decisions; and (iii) sorting based on preferences in exit decisions is not quantitatively important.

VII. Conclusion

This study documents differences between appointment and election, focusing on state trial court judges and their sentencing patterns. The analysis shows that elected judges have much larger variability in their decisions than do appointed judges. The appointment system yields homogenous policy outcomes through selection based on preferences. In contrast, elected judges have diverse preferences and

strong reelection concerns. Overall, elected judges' diverse sentencing preferences explains 73 percent of the difference in sentencing variability between elected and appointed judges. This implies that both public officials' policy preferences and their reelection incentives are important determinants of differences in policy outcomes under the two selection systems.

Overall, the advantage of election over appointment in terms of the degree of congruence between policy outcomes and the preference of relevant constituents is only moderate. Rather, the key difference between the two systems is in the identity of the constituents whose preference is reflected in policy outcomes. That is, under appointment, the preference of the median voter in the entire state is reflected in policy outcomes, while local preferences are reflected under election.

Through counterfactual experiments, this paper also finds that the effectiveness of reelection incentives is highly dependent on large payoffs from holding office. This suggests that appointment may be more effective in achieving policy congruence when voter preferences are not substantially heterogenous across jurisdictions and payoffs from office are relatively low. In addition, to the extent that reelection incentives negatively affect job security, which decreases the value of holding office, they may discourage public officials with a high level of human capital from holding office.

While this study provides an enhanced understanding of preferences and reelection incentives of public officials, there are remaining issues that require further research. First, given that the effectiveness of reelection incentives depends very much on the payoffs from holding office, there needs to be more research on how the size of payoffs is related to the usage of reelection incentives across different types of public offices. Second, this study focused primarily on policy outcomes relative to turnover rates, because judges as a whole have relatively low turnover as a result of large payoffs from holding office. Studying turnover rates and policy outcomes in other public offices that have similar variation in selection systems but with smaller payoffs from the job will improve our understanding of the functioning of incentives for public officials. Third, this study did not analyze individuals' decisions to enter public office. Research on the relationship between selection system, payoffs from holding office, and the characteristics of those who enter public office will enhance our understanding of how to design the selection process and incentives for public officials.

Appendix A. Reelection Probability and Parameter Estimates

Table A1—Parameter Estimates

Parameter	Component of the model	Estimate	Standard error
Panel A. Payoff in the court			
α_B	Payoff from the seat	174,878.2	73,832.7
α_{NC}	Additional payoff from noncrime seat	−44,784.7	53,848.9
γ_H	Scale—Harsh type	42,306.2	16,246.7
γ_S	Scale—Standard type	58,772.7	18,747.6
γ_L	Scale—Lenient type	38,085.9	17,310.4
x_S^*	Bliss point—Standard type	0.4447	0.0123
σ_u	Common scale parameter	0.2375	0.0095
α_R	Payoff from running	−16,2276.8	9,5914.0
α_H	Payoff from the high courts	365,783.2	32,9912.7
Panel B. Reelection probability			
ϕ_1	Constant	1.2092	0.0680
$\tilde{\phi}_{DC}$	Scale—Democrat, conservative	0.4709	0.0771
$\tilde{\phi}_{DL}$	Scale—Democrat, liberal	0.0006	0.0015
$\tilde{\phi}_{RC}$	Scale—Republican, conservative	0.9796	0.1015
$\tilde{\phi}_{RL}$	Scale—Republican, liberal	0.7310	0.0568
$\hat{x}_C$	Bliss point—conservative districts	0.4336	0.0101
$\hat{x}_L$	Bliss point—liberal districts	0.0104	0.0433
σ_f	Common scale parameter	0.1853	0.0118
θ	Weight on the first period decision	0.9254	0.0858
ϕ_3	$I[Noncrime_i]$	−0.3673	0.2687
ϕ_4	Age_{it}	0.0285	0.0015
ϕ_5	$Tenure_{it}$	−0.0804	0.0051
ϕ_6	$I[SOD = 1] \times I[Party_i = D]$	−0.7944	0.0991
ϕ_7	$I[SOD = 2] \times I[Party_i = D]$	−0.8086	0.0437
ϕ_8	$I[SOD = 3] \times I[Party_i = D]$	−0.0600	0.2287
ϕ_9	$I[SOD = 1] \times I[Party_i = R]$	−0.1541	0.0339
ϕ_{10}	$I[SOD = 3] \times I[Party_i = R]$	−1.2733	0.2330
Panel C. Scale parameters of taste shocks			
σ_Z	Scale—policy	20,102.2	6,302.2
σ_S	Scale—staying	171,855.1	43,894.0
Panel D. Payoff outside court			
β_0	Wage—constant	10.0550	0.2116
β_1	Wage—Expriv1	0.9154	0.2366
β_2	Wage—Expriv2	0.9627	0.2318
β_3	Wage—Expriv3	1.1214	0.2200
α_L	Payoff from leisure	155,694.8	58,998.7

In this section, we specify the latent variable $g(\cdot)$ for the reelection probability of elected judges and present parameter estimates of the whole model. The latent variable $g(\mathbf{XR}_{it})$ can be divided to three different components.

$$g(\mathbf{XR}_{it}) = g_1(p_{it}, p_{it-1}, Dist_i, Party_i, Noncrime_i) + g_2(Age_{it}, Tenure_{it}) + g_3(Party_i, SOD_{it}). \tag{A1}$$

The first part (g_1) measures the effect of sentencing decisions. We allow voter preferences over sentencing to differ across political orientation of the district, $Dist_i$. Additionally, voters may have different prior views about judges from different parties, which affects the marginal effect of sentencing decisions. Hence,

we also allow sentencing decisions to have different effects depending on judges' party affiliation ($Party_i$). Since sentencing decisions are relevant only when judges are in seats that have been assigned criminal cases, we interact the effect of sentencing decisions with the dummy variable, $Noncrime_i$. As in the specification of payoff from sentencing decisions, we employ a bell-shaped function of the continuous jail time variable. Then we derive the effect of discrete sentencing decisions from the underlying function of jail time. Specifically, when a judge's choice of normalized jail time is $x \in [0, 1]$ and voters' most preferred point is $\hat{x} \in [0, 1]$, the effect of sentenced jail time on the latent variable of reelection probability is

$$f(\hat{x}, x) = \tilde{\phi} \cdot \exp\left(-\left(\frac{\hat{x} - x}{\sigma_f}\right)^2\right) - \tilde{\phi}, \tag{A2}$$

where $\tilde{\phi} > 0$, $\sigma_f > 0$, and $x, \hat{x} \in [0, 1]$. We allow the scale parameter $\tilde{\phi}$ to differ across parties and political orientation of districts. That is, we estimate $\tilde{\phi}_{DC}$, $\tilde{\phi}_{DL}$, $\tilde{\phi}_{RC}$, and $\tilde{\phi}_{RL}$ for Democrats in conservative districts, Democrats in liberal districts, Republicans in conservative districts, and Republicans in liberal districts, respectively. We also allow the bliss point of voters, $\hat{x}$, to be different for voters in conservative districts ($\hat{x}_C$) and voters in liberal districts ($\hat{x}_L$). In brief,

$$\begin{aligned} g_1(p_{it}, p_{it-1}, Dist_i, Party_i, Noncrime_i) \\ = \phi_1 + \{\phi_2(Party_i, Dist_i, p_{it}) + \theta\phi_2(Party_i, Dist_i, p_{it-1})\} \\ \times I[Noncrime_i = 0] + \phi_3 I[Noncrime_i = 1], \end{aligned} \tag{A3}$$

in which

$$\phi_2(Party_i, Dist_i, p_{it}) = \begin{cases} \int_0^{0.2} f(\hat{x}, x; Party_i, Dist_i)\, dx/0.2, & \text{if } p_{it} = L \\ \int_{0.2}^{0.4} f(\hat{x}, x; Party_i, Dist_i)\, dx/0.2, & \text{if } p_{it} = SL \\ \int_{0.4}^{0.6} f(\hat{x}, x; Party_i, Dist_i)\, dx/0.2, & \text{if } p_{it} = S \\ \int_{0.6}^{0.8} f(\hat{x}, x; Party_i, Dist_i)\, dx/0.2, & \text{if } p_{it} = SH \\ \int_{0.8}^{1} f(\hat{x}, x; Party_i, Dist_i)\, dx/0.2, & \text{if } p_{it} = H \end{cases} \tag{A4}$$

and θ is the weight of p_{it-1} relative to p_{it}. The second part, g_2, is

$$g_2(Age_{it}, Tenure_{it}) = \phi_4 Age_{it} + \phi_5 Tenure_{it}. \tag{A5}$$

The last part of the latent variable (g_3) captures the effect of voter preference over parties, by interacting party affiliation with political climate:

$$\begin{aligned}(\text{A6}) \quad & g_3(Party_i, SOD_{it}) \\ &= \phi_6 I[SOD_{it} = 1] \times I[Party_i = D] + \phi_7 I[SOD_{it} = 2] \times I[Party_i = D] \\ &\quad + \phi_8 I[SOD_{it} = 3] \times I[Party_i = D] + \phi_9 I[SOD_{it} = 1] \\ &\quad \times I[Party_i = R] + \phi_{10} I[SODit = 3] \times I[Party_i = R].\end{aligned}$$

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