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Queuing up for justice: Elections and case backlogs

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Title: Queuing Up For Justice:
Elections and Case Backlogs

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Queuing Up For Justice: Elections and Case Backlogs*

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Abstract

We analyze the impact of prosecutor elections on case backlogs. Previous evidence has shown that re-election pressures result in more cases going to trial. Since trials require time and resources, one can expect an effect on the queue. Two competing theories are developed: one of signaling quality in an asymmetric information environment and one of effort exertion, each of which can explain increased trials before election, but differ in their predictions regarding the impact on backlogs. A district-level, panel data set of caseload flows in North Carolina is analyzed. Evidence is presented that contested re-elections are associated with a decrease in the number of cases handled and an acceleration of the growth of the backlog. This suggests that retention concerns lead to signaling which causes distortions, re-allocating resources from disposing cases to prosecuting cases at trial.

JEL codes: K41, D82

Keywords: case backlog, elections, prosecutor

1 Introduction

In this paper we analyze how electoral incentives of state prosecutors affect an important ingredient of the criminal justice system: case backlogs. A distinctive feature of the United States' criminal justice system is that some of the important regulators of the system, such as prosecutors and judges, are generally elected by popular vote.¹ Their influence on the criminal justice system is

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¹The four states that do not elect the prosecutors are Alaska, Connecticut, New Jersey, and Rhode Island. For a discussion of judicial retention mechanisms see Shepherd (2009).

enormous. There are 2344 local prosecutor offices in the U.S., which collectively handle around 2.3 million felony cases each year (Perry, 2006) accounting for approximately 95% of all criminal prosecutions (Simmons, 2004). Given their importance in the functioning of the criminal justice system, one would like to understand the impact that popular election of prosecutors has on how they choose to exercise their discretion. Recent papers (Bandyopadhyay and McCannon, 2014a; 2014b) suggest that re-election motives affect the mix of trials and plea bargains. In particular, using data from North Carolina they find that the use of trials increases as elections approach. The effect is enhanced for contested campaigns. Given the limited resources available, a natural question to ask is whether this has an effect on case dispositions.

Rasmusen, Raghav, and Ramseyer (2009) investigate the decision to prosecute a case or dismiss it. They consider an environment where a prosecutor is interested in allocating the office’s budget and effort to obtaining convictions, improving conviction rates, and obtaining “personal goals”. Using a cross-sectional dataset they show that increased budgets increase both conviction rates and the number of convictions. They do not consider the effect of re-election pressures or analyze the decision to engage in plea bargaining versus proceeding to trial. We extend their framework to incorporate both. It is shown in this effort exertion environment that retention issues reduce backlogs as it discourages slack resources. The framework is similar in nature to Gordon and Huber (2002) who consider the impact of voters using observable signals of performance to induce prosecutorial effort. To get an alternate understanding of what may happen as a result of electoral incentives increasing the use of trials, we also adapt the framework of Bandyopadhyay and McCannon (2014a; 2014b) who focus on adverse selection issues. In their model prosecutors use resources to the full and, thus, when they increase trials they have to do so at the expense of being able

to process fewer cases, leading to an increase in backlogs. While both the effort exertion and signaling environments can explain the empirical observations of increased use of the courtroom and reduced plea bargaining during re-election season, they differ in their predictions regarding the impact on case backlogs.

We carry out an empirical analysis using a panel dataset of caseload work-flows from North Carolina to see which of the two theories does the empirical evidence support. The results are consistent with the signaling hypothesis but not with that of increased effort. Three variable are analyzed: the number of cases left pending, the change in the backlog from the beginning to the end of the year, and the number of cases dismissed. Our results show the first two increase, consistent with the hypothesis that prosecutors divert resources to pursue more trials. Interestingly, the number of dismissed cases decreases, which contributes to the backlog.

This has important policy implications. If elections encourage enhanced effort, then those states in the U.S. which do not use elections as well as European policymakers, for example, may need to consider replacing their appointment systems. Alternatively, if re-election pressure distorts the criminal justice system, as is argued here, alternative institutions should be considered.

This work is related to the research on the allocation of resources as well as work on career concerns of prosecutors. Early analysis of prosecutors focused on the allocation of the office's budget and the role of plea bargaining (Landes, 1971; Forst and Brosi, 1977). Glaesar, Kessler, and Piehl (2000) find evidence that career concerns affect the decisions of federal U.S. Attorneys and, specifically, has led to an increase in the federalization of drug crimes. Boylan (2004) connects salaries and turnover and Boylan (2005) analyzes data of chief federal prosecutors (who are appointed rather than elected) and their subsequent careers. Boylan and Long (2005) show that prosecutors use experience in trials as

a career advancement mechanism. The retention of local prosecutors has also been qualitatively analyzed by Wright (2009), who presents stylized facts on media coverage of these elections. Dyke (2007) considers case-level data showing that fewer cases are dismissed when prosecutors run for re-election. Finally, McCannon (2013) demonstrates that appeals of criminal convictions are more successful when the prosecutor was running for re-election during the time of the trial, necessitating more modifications of lower-court convictions.

There is a growing literature which analyzes how career concerns affect the behavior of public officials. Hanssen (1999) argues that knowledge of how court decisions will affect powerful groups, who provide support for elected judges, narrows the range of likely rulings. This diminishes the uncertainty and, consequently, decreases the amount of litigation. Hanssen (2000) provides evidence that independent judges, less influenced by political motives, provide administrative agencies the incentive to spend more effort attempting to protect their actions from judicial review. Shepherd (2009) analyzes the voting behavior of state supreme court judges and finds it is influenced by the preferences of the electorate. Berdejo and Yuchtman (2013) analyze data on Washington state judges and find that sentences are around 10% longer at the end of a judge's political cycle than the beginning. Lim (2013) estimates a dynamic structural model to see how competitive elections versus appointment by the Governor affect the sentencing decisions of judges and finds strong evidence that elections influence judicial behavior. Finally, Dimitrova-Grajzl, Grajzl, Sustersic, and Zajc (2012a) provide evidence from Slovenian courts that promotion opportunities increase the number of cases handled by a judge.

Related work on the incentives of regulators also reveals interesting issues. Leaver (2009) considers an environment of asymmetric information on the quality of public servants. She analyzes the impact of the length of term in office on

how diligently the reputationally-motivated bureaucrat regulates. Schotts and Wiseman (2010) present an asymmetric information model where investigators differ on the aggressiveness with which they pursue charges. While not about the behavior of prosecutors, these papers show strong evidence that retention motives impact the outcome of the justice system.

Additionally, there are a number of papers on signaling in asymmetric information environments between a prosecutor and a defense attorney. See Reinganum and Wilde (1986) for an initial investigation and Reinganum (1998, 2000) for applications addressing specific policy interventions.

We look at alternate theoretical models in section 2. Section 3 describes the data and section 4 presents the results. Section 5 concludes.

2 Theoretical Framework

Consider the handling of cases by a prosecutor’s office in a given period of time (e.g. a year). Let N denote the total number of cases filed, which is taken as exogenous. Also, suppose there is a fixed amount of resources R available per period to handle the stock of cases. For each case filed, the prosecutor can either take it to trial, $a = t$, plea bargain the case, $a = p$, or do nothing, $a = n$. For ease of exposition this action will be thought of as leaving the case pending. We do not, though, differentiate in the theoretical model between leaving a case pending and dismissing the charges.² The difference between the two, from the perspective of the caseload, is whether in future years a conviction is pursued. The option n is one where a conviction is not currently pursued. Denote the number of cases where action a is taken as N_a . It follows, then, that $N_a \geq 0$ and $N_t + N_p + N_n = N$.

²One can imagine that the decision is after the initial “stink test” has been conducted eliminating inappropriate arrests. (Informal discussions with DA office insiders reveal that they use a different, but related, adjective for the test!)

For each action taken on a case costs arise. Each case filed incurs a cost $c \geq 0$. One may think of this cost as the expenses associated with processing and the initial investigation of evidence presented to the prosecutor's office by law enforcement. Cases plea bargained incur an additional cost of C_p , while those taken to trial incur a cost C_t . Trials are very costly. A significant amount of public resources must be devoted to the judicial system and these are greater for jury trials and, thus, consume a lot of the financial resources of a prosecutor's office. Plea bargaining is significantly cheaper for everyone involved. Not pursuing a conviction, then, saves these additional expenses. Define $\kappa = C_t - C_p$ and, hence, assume $\kappa > 0$. The resources available comprise a budget constraint for the prosecutor. Hence,

$$R \geq cN + C_p N_p + C_t N_t. \quad (1)$$

This setup assumes that there are no economies of scale or economies of scope to prosecutorial production (which is, of course, a simplification), but rather a constant marginal cost of case handling.

Suppose each case that arises during the period can be described by the parameter θ , which represents the strength of evidence the prosecutor has against the defendant in a criminal case. Assume $\theta \in [0, \theta_m]$ where $\theta_m < \infty$. Each case may be taken to trial, plea bargained, or left pending. On incurring the cost of investigation, c , a prosecutor is able to discover the parameter θ for each case.

Prosecuting cases provides benefits. Let $S(\theta)$ denote the expected sanction achieved at trial. One can think of this as the expected value, taking into account not only the anticipated sanction, but also the likelihood of conviction, quality of defense representation, parole opportunities, appeals, etc. As θ is a measurement of evidence, assume $\frac{dS}{d\theta} > 0$. Let $P(\theta)$ denote the expected sentence obtained with plea bargaining. Again, assume $\frac{dP}{d\theta} > 0$. Set the expected

sanction of $a = n$ equal to zero.

A number of assumptions are employed. First, plea bargaining achieves a lower sanction than what is expected from trial. Hence, assume $S(\theta) > P(\theta) \forall \theta$. To guarantee interior solutions assume that, for cases with sufficiently great evidence, pursuing a conviction results in sanctions that exceed the cost and that for cases with sufficiently weak evidence pursuing a conviction generates an expected sanction less than the cost. Rather, there exists a $\bar{\theta}_a$ such that $S(\theta) > C_a \forall \theta > \bar{\theta}_a$ and $S(\theta) < C_a \forall \theta < \bar{\theta}_a$.³ Third, for ease of analysis assume the rate of increase in S exceeds that of P so that for large values of θ it is preferable to pursue the conviction at trial. Rather, if $D(\theta) \equiv S(\theta) - P(\theta)$, then $\frac{dD}{d\theta} > 0$. Finally, there exists a θ' where $D(\theta) \geq \kappa \forall \theta \geq \theta'$.⁴

Hence, in each case the prosecutor observes θ and selects an action $a \in \{t, p, n\}$, which generates the expected, case-level utility of

$$u(a) = \begin{cases} S(\theta) - C_t & \text{if } a = t \\ P(\theta) - C_p & \text{if } a = p \\ 0 & \text{if } a = n \end{cases} . \quad (2)$$

2.1 Decisionmaking with Resource Constraints

The optimal decisionmaking of a prosecutor in this environment is rather straightforward. For cases with high levels of evidence convictions are pursued at trial. Specifically, all cases with $\theta \geq \theta'$ result in $u(t)$ being greatest. Cases with $\theta \in [\bar{\theta}_p, \theta')$ result in $u(p)$ being maximal since the utility to plea bargaining ex-

³Since it is assumed that $\frac{dS}{d\theta}, \frac{dP}{d\theta} > 0$ and C_a is a constant, a unique crossing-point exists for each action. This assumption can be relaxed. With a binding budget constraint not all cases can go to trial, while with a slack, fixed cost budget constraint unused resources can be used to generate longer sanctions at trial. Alternatively, signaling motivations may drive a case to trial even if plea bargaining is socially optimal (Bandyopadhyay and McCannon, 2013).

⁴While these assumptions seem strong, they are all based on the value of the parameter θ . One could re-order the metric to ensure these assumptions hold. Thus, while we interpret θ to be a parameter measuring quality of evidence, the theoretical model simply requires that it is measured in such a way as to ensure these four assumptions hold. Rationalization of the final assumption can be found in Bandyopadhyay and McCannon (2014a). Furthermore, for ease of analysis, assume $\theta' > \bar{\theta}_a$.

ceeds not pursuing a conviction and the utility to plea bargaining is greater than taking the case to trial (since the cost of trial is high relative to the expected sanction received). For cases with $\theta < \bar{\theta}_p$, $a = n$. Assuming the prosecutor's utility is proportional to welfare, this outcome represents the optimal one for society.

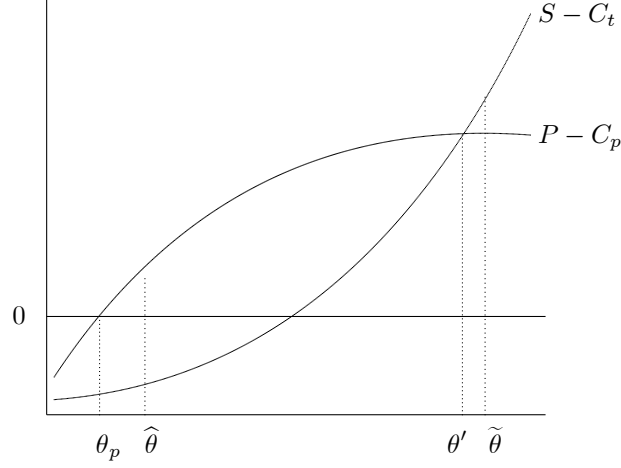
The budgets of public prosecutors are limited, which inhibits their ability to prosecute all cases that come before them. The optimal outcome just described presumes there are no resource constraints (so that the prosecutor need only weigh the marginal benefit to prosecution to its marginal cost). Limiting the total funds available adjusts the two margins described. The threshold which divides the decision to pursue a conviction at trial versus settle at the negotiating table shifts to the right to conserve on office resources. The logic of this result is that the benefit of a trial for those cases near θ' is not much greater than the return from plea bargaining (there is zero gain at θ'). With limited resources the last case a prosecutor would be able to dispose of would be one where $u(p)$ is substantially greater than zero. Shifting the action for the case near θ' to $a = p$ conserves on the costs, allowing for more case disposition improving total well-being. Similarly, the critical value of θ that defines the decision to engage in plea bargaining from the decision to not pursue a conviction also shifts to the right. Denote the optimal value of the first as $\tilde{\theta}$ and the second as $\hat{\theta}$.

It is instructive for the analysis that follows to derive this result. Let $F(\theta)$ denote the distribution function over the support $[0, \theta_m]$ for the realization of the case characteristics, θ . For example, then, if the prosecutor selects $a = n$ for $\theta < \theta_1$, $a = p$ for $\theta \in [\theta_1, \theta_2)$, and $a = s$ for $\theta \geq \theta_2$, the budget constraint requires that

$$\frac{R}{N} \geq \int_{\theta_1}^{\theta_2} C_p dF(\theta) + \int_{\theta_1}^{\theta_m} C_t dF(\theta) + c. \quad (3)$$

The prosecutor selects the thresholds θ_1 and θ_2 to maximize the total utility

Figure 1: Prosecution with Resource Constraints



gained over the course of the year,

$$U = \int_{\theta_1}^{\theta_2} [P(\theta) - C_p] dF(\theta) + \int_{\theta_2}^{\theta_m} [S(\theta) - C_t] dF(\theta). \quad (4)$$

Given the assumptions of the model, the optimal decisionmaking for the prosecutor is to select the θ_1 and θ_2 that maximize U while satisfying (4).

A decrease in θ_2 to expand the number of trials results in an increase to utility of $[D(\theta_2) - \kappa] f(\theta_2) d\theta_2$. Since the $u(a)$ is increasing in θ for $a = p$ and $a = t$, so long as the budget constraint constrains the activities of the prosecutor (which it will in equilibrium), this expansion requires an increase in θ_1 . This decreases utility by $-[D(\theta_1) - \kappa] f(\theta_1) d\theta_1$. The optimal prosecutorial decisionmaking with resource constraints is at the point where the marginal effects are equal and the budget is exhausted. In essence, the marginal rate of substitution equates with the relate “prices” of the two goods (i.e., costs of the modes of prosecution). This defines $\tilde{\theta}$ and the second as $\hat{\theta}$. Figure 1 illustrates.

2.2 Decisionmaking with Retention Concerns Under Asymmetric Information and a resource constraint

The previous analysis considered a civic-minded prosecutor. She is interested in obtaining stiff sentences for those she believes commits crimes, but also balances the sanction with the costs incurred. Empirical evidence of prosecutorial decisionmaking illustrates that when re-election pressures are high prosecutors act more aggressively by taking more cases to trial. This is consistent with arguments that due to asymmetric information between the incumbent prosecutor and the voting public, trials garner longer sentences and publicity that voters use as signals of the prosecutor's skill.

Thus, to incorporate retention concerns into this framework assume that with re-elections, when the stiffer sanction is pursued at trial, the prosecutor receives an additional bonus, b . The details of why this is consistent with voter's optimal behavior is analyzed in Bandyopadhyay and McCannon (2014a; 2014b) and is not repeated here. One may think about the bonus, for example, as the expected benefit a prosecutor's re-election campaign gains from a particular case going to trial. If the prosecutor either declines to pursue a conviction or makes a plea bargain, this gain is not realized. To extend the previous analysis assume that while $u(p)$ and $u(n)$ remain unchanged, the payoff from a case going to trial is now

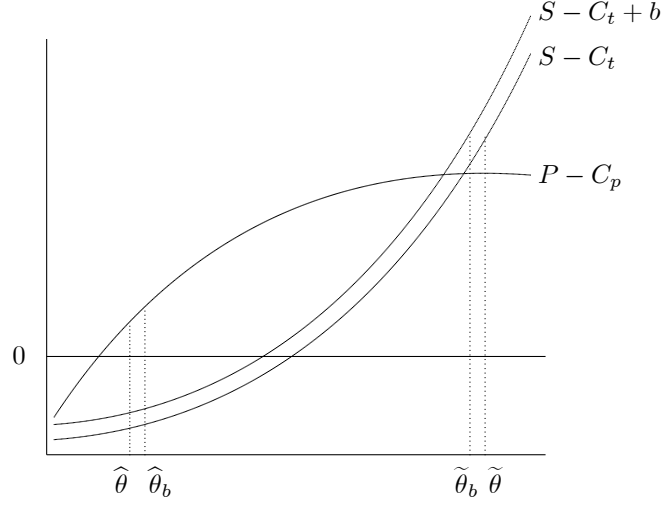
$$u_b(t) = S(\theta) - C_t + b.$$

Consequently, the prosecutor's objective function is

$$U_b = \int_{\theta_1}^{\theta_2} [P(\theta) - C_p] dF(\theta) + \int_{\theta_2}^{\theta_m} [S(\theta) - C_t + b] dF(\theta). \quad (5)$$

The bonus the prosecutor receives for taking a case to trial during a re-election campaign opens up the potential for a wedge driven between her preferences and

Figure 2: Prosecution with Retention Concerns



social welfare, consequently distorting in the outcomes of the criminal justice system.

Define $\tilde{\theta}_b$ and $\hat{\theta}_b$ as the threshold values with the bonus. With this additional bonus the previous outcome is no longer optimal. The marginal benefit to a decrease in θ_2 , i.e., taking more cases to trial, increases. As a consequence, $\tilde{\theta}_b < \tilde{\theta}$. Additionally, the shift in resources towards jury trials comes as the expense of fewer pleas and total fewer cases investigated so that $\hat{\theta} < \hat{\theta}_b$. Figure 2 illustrates the outcome with retention concerns.

Thus, in an environment with resource constraints and retention concerns one would predict that the number of jury trials would increase, the number of plea bargains would decrease, and the number of unresolved, pending cases would increase as compared to the outcome without re-election concerns.

2.3 Decisionmaking with Retention Concerns and Slack Resources

While the previous subsection considered a distortion to prosecutorial decision-making when courtroom convictions provide information to voters, an alternative hypothesis is that the observed increase in jury trials illustrated in previous empirical research comes from additional effort exerted by incumbents. Prosecutors may value their leisure as well as choose to retain some of their available resources for personal use other than increased prosecution. This implies that the prosecutors do not completely utilize their resource constraint. Voters interested in maximizing the number of convictions, given the dollars spent on the prosecutor's office, may exert pressure on the incumbent to expand its prosecution.

One way to formalize this hypothesis is to suppose a gain is received for each conviction obtained during re-election season. The gain is received regardless of whether the sentence is obtained via plea bargaining or jury trial. Denote the gain as g . The gain is not earned, though, if a conviction is not pursued ($a = n$).⁵ Other than the utility from prosecution, $u(a)$, and the gain, the prosecutor benefits from the unexerted resources. If e is the right-hand-side of (3), then the incumbent benefits from $r - e$. Let the payoff from this be $w(r - e)$. Assume $w(0) = 0$ and $w' > 0$. Consequently, the prosecutor's total payoff is

$$U_g = \int_{\theta_1}^{\theta_2} [P(\theta) - C_p + g] dF(\theta) + \int_{\theta_2}^{\theta_m} [S(\theta) - C_t + g] dF(\theta) + w(r - e) \quad (6)$$

if, as before, all cases with $\theta \geq \theta_2$ have $a = t$, cases with $\theta \in [\theta_1, \theta_2)$ have $a = p$, and $a = n$ otherwise.

⁵Our main purpose is to show that if voters reward more active prosecutors, with slack resources they will pursue more charges (rather than leave pending) and so we do not add the complication of making the bonus vary by trial or plea. We can think of the prosecutor's re-election chances improving with more cases pursued. Hence, the bonus can be interpreted as the monetary value that a prosecutor assigns to an increased probability of re-election.

This setup is an extension of Rasmusen, Raghav, and Ramseyer (2009) who consider the effect of an expansion of prosecutors' budgets on the extensive margin (the number of convictions pursued) and the intensive margin (the amount of resources devoted to each case). Like them, we assume the prosecutor gains from un-utilized resources and from convictions pursued.

Denote the thresholds selected in equilibrium as $\tilde{\theta}_g$ and $\hat{\theta}_g$. It is straightforward to conduct a comparative analysis of the outcomes that arise. Without the gain to exerting effort ($g = 0$), both thresholds shift to the right as compared to the baseline analyzed in subsection 2.1, $\tilde{\theta}$ and $\hat{\theta}$. The benefit to prosecution is balanced against both the cost of the prosecution along with the disutility of effort from expending the resources. Thus, fewer trials arise and more cases are left pending when effort exertion is costly.

The election campaign, modeled as a non-zero value of g , adds the incentive to use more of the prosecutorial resources. This will shift both thresholds to the left.

As a consequence, if one considers effort when resources are slack, then the effect of the re-election campaign is straightforward. There will be more trials and there will be fewer cases left pending. It is not necessarily clear what the impact will be on the amount of plea bargaining undertaken without making strong assumptions regarding the distribution function F since both the threshold between trial and pleas shifts out, increasing plea bargaining, but the cutoff for prosecuting a case also increases, decreasing plea bargaining.

The primary distinction between the two hypothesis developed in subsections 2.2 and 2.3 is the effect of the re-election campaign on the number of cases left pending. If the behavior of prosecutors is distorted towards encouraging more trials, which is consistent with a theory of signaling in an asymmetric information environment (without slack resources), then the number of cases left

unresolved should increase when retention concerns are great. If the behavior of prosecutors is shifted towards exerting more effort when retention pressures are substantial, then there will be fewer unresolved cases.

3 Data

Data on crime, convictions, and elections in North Carolina are collected. While there are one hundred counties in the state, there are only forty-three prosecutorial districts. More heavily populated counties, such as Mecklenburg county which contains the city of Charlotte, make up an entire district. More rural, less-populated counties are grouped together into a single prosecutorial district. Each district has one chief public prosecutor known as the District Attorney who is elected by voters to serve a four-year term. Each district attorney has a team of assistant district attorneys (ADAs) and other supporting staff. In 2007, for example, the average number of ADAs per office in NC is 14.8 with 16.9 supporting staff members.⁶

Data for felony prosecutions are collected from the North Carolina Sentencing and Policy Advisory Commission. Each year the Commission publishes the *North Carolina Trial Court Caseload* report.⁷ The report provides data on the filing and disposing of criminal charges for the fiscal year from July 1 to June 30 of the following year. Data are collected from the 1999-2000 fiscal year to the 2009-10 fiscal year. Thus, the data set covers eleven years of convictions in NC. Only felony convictions are considered here. In each year a variety of information is available. The report provides for each district the total number of filed cases over the year and pending cases at the end of the year. Information is given on how many cases went to trial, ended in guilty pleas, and how many were dismissed. Furthermore, the average age of the cases disposed of is

⁶From *Census of State Prosecutors, 2007*; www.icpsr.umich.edu/icpsrweb/NACJD/studies33202.

⁷www.nccourts.org/Citizens/SRPlanning/Statistics/Caseload.asp

calculated for the year for a district.

From this information the variable *pending* measures the total number of cases left unresolved at the end of the year. Furthermore, the difference between *pending* and the number of unresolved cases from the previous year is the variable *backlog*. Hence, *pending* captures the absolute level of the queue and *backlog* measures the change in this level. These two are used as dependent variables to identify the effect of election pressures on the caseload. Additionally, *dismiss* measures the proportion of disposed cases that are dismissed. Cases can be disposed of by being dismissed, or by a conviction being pursued (either through a guilty plea or jury trial). This will also be used as a dependent variable to assess how challenged incumbents handle their jobs. The total number of cases filed, *filed*, the total number of trials, *trials*, and the mean number of days from the day of filing charges to the day of disposal, *age*, are used as caseload control variables. The number of charges filed captures the direct demand side for prosecutorial services, while the number of trials and the age of the cases potentially affects the distribution of effort and resources in the office.

Furthermore, socio-economic variables are created to control for differences between the districts and within a district over time. Population data are collected from the North Carolina Office of State Budget and Management.⁸ Annual, county-level population estimates are provided. Hence, *density* calculates the number of individuals who live in a district in each year divided by the number of square miles the district covers. The variable %16 – 24 measures the fraction of a district’s population that is between the ages of sixteen and twenty-four. Additionally, the Office provides data on the number of males and

⁸ www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/county_estimates.shtm provides the data and a description of the estimation procedures used.

the number of whites in each county in each year. Thus, *white* is the fraction of the population of a district who are identified as white and *male* is the fraction of the district in each year that is male. Additionally, district-level labor market data are collected from the Employment Securities Commission of North Carolina. The unemployment rate, *ur*, and the labor force participation rate, *lfpr*, are used as a control for economic opportunities and the opportunity cost of crime.⁹

There are four circumstances where the composition of the district changed. While at no time was a county split between multiple districts, in four situations a prosecutorial district which contained multiple counties was split into two districts. In the fiscal years 1999-2000 to 2005-06 there were thirty-nine districts. District 20 initially contained four counties. For the 2006 election one county was split from the others to create districts 20a and 20b. The incumbent vacated the position and, therefore, two newly created districts originated in 2006. Also, district 29 contained five counties. Two of the counties were split off to create a new district, 29a, and an open election was held in 2006 to fill the vacancy. The remaining counties were relabeled 29b and the same DA who had been an unchallenged incumbent was again unchallenged for the position. Thus, 29b is considered a continuation of 29. Hence, for the 2006-07 and 2007-08 fiscal years there were forty-one prosecutorial districts. Initially, district 22 contained four counties. While in 2006 an individual ran unopposed to fill a vacant seat, by the 2008 election the district was divided into two separate districts each with two counties. The incumbent remained the DA for the district, 22b, and an election was held for the newly created district, 22a. Thus, 22b is considered a continuation of 22. Finally, one county was split from district 19b to create a brand new district, 19d, in the 2008 election creating a new district. As a

⁹Labor data are obtained from www.nces.com. Labor force participation rate is simply calculated as the labor force divided by the population.

result, for the 2008-09 and 2009-10 fiscal years there are forty-three prosecutorial districts. Consequently, there are 441 observations.

Finally, election data are collected from the North Carolina State Board of Elections.¹⁰ Dummy variables are created to capture the election outcomes. The dummy variable CI is equal to one if the incumbent of a district runs for re-election in the next year and has a challenger either in the primary or the general election (or both).¹¹ CI is equal to zero if there is no upcoming election, if the incumbent is not running for re-election, or if the incumbent is running for re-election but does not have a competitor. Since the data are measured in fiscal years the campaigning, challenger entry, and primary contests occur in the fiscal year prior to the general election. Adjustments to the prosecutor's decisionmaking is, then, expected to occur in the fiscal year before the general election. Note that the year of the election includes eight months of post-election outcomes, which will likely not be affected by previous or future election campaigns.¹²

Second, the dummy variable *reelect* is equal to one if it is the year before an incumbent runs for re-election. *Reelect* is equal to zero if it is not the year before an election or if it is the year before an election but the incumbent does not run for re-election in the following year.

These variables are used to measure re-election pressures. It is posited that in the year before a re-election campaign an incumbent, if she does adjust her behavior to the election cycle, will respond more in that year than the previous

¹⁰ www.sboe.state.nc.us

¹¹ Since the fiscal year begins July 1 of the calendar year and the general election is in November of the year, the election is considered within the year if the general election is held in the fiscal year. This implies, though, that the voting for the primaries occur just before the beginning of the fiscal year in which they are recorded.

¹² If, in the results presented in the next section, CI_{t+1} and $reelect_{t+1}$ were measured for the year of the election and added to the specifications (either substituting or in addition to CI and $reelect$), then they are insignificant and do not affect the sign and significance of CI and $reelect$. Hence, empirically, this is the appropriate measurements of election pressures.

years. We assume voters focus more heavily on the prosecutor's performance in the year prior to the election as well. This is a common assumption in the literature on political business cycles (Rogoff, 1990; Rogoff and Siebert, 1988).

Additionally, information on the political party of the prosecutor is available. The variable *rep* is equal to one if and only if the incumbent in the district in that year is a Republican. Since no third-party candidate won a race (in only a few cases unaffiliated or Libertarian challengers entered the general election) a value of *rep* = 0 indicates a district with a Democrat as its prosecutor for the year.

Table 1 presents the variables of interest to the econometric model.

variable	description
<i>dependent variables</i>	
<i>backlog</i>	change in # of cases pending from one year to the next
<i>pending</i>	# of cases left unresolved at the end of the year
<i>dismiss</i>	# of cases dismissed / # of cases disposed
<i>election variables</i>	
<i>CI</i>	=1 if in the next year the incumbent is challenged
<i>reelect</i>	=1 if in the next year the incumbent runs for re-election
<i>caseload variables</i>	
<i>filed</i>	# of new cases filed during the year
<i>trial</i>	# of cases taken to trial
<i>age</i>	avg # of days between filing charges and disposing of the case
<i>socio-economic variables</i>	
<i>density</i>	population / mile ²
%16 – 24	% of population between the ages of 16 and 24
<i>male</i>	% of population that is male
<i>white</i>	% of population that is white
<i>ur</i>	unemployed / (employed + unemployed)
<i>lfpr</i>	labor force / population
<i>rep</i>	=1 if the incumbent is a Republican

Additionally, district and year fixed effects are included. Table 2 presents the descriptive statistics.

Table 2: Descriptive Statistics

	mean	st. dev.	min	max
<i>dependent variables</i>				
<i>backlog</i>	66.551	310.14	-1085	1932
<i>pending</i>	1543.1	1280.3	114	8310
<i>dismiss</i>	0.1759	0.0659	0.0395	0.3589
<i>election variables</i>				
<i>CI</i>	0.0544	0.2271	0	1
<i>reelect</i>	0.2109	0.4084	0	1
<i>caseload variables</i>				
<i>filed</i>	2574.6	1770.7	529	10077
<i>trial</i>	50.420	40.722	1	225
<i>age</i>	202.74	55.911	81.874	475.00
<i>socio-economic variables</i>				
<i>density</i>	269.45	294.69	35.806	1698.5
<i>%16 – 24</i>	0.1295	0.0235	0.0952	0.2052
<i>male</i>	0.4905	0.0098	0.4685	0.5280
<i>white</i>	0.7409	0.1559	0.3489	0.9772
<i>ur</i>	0.0631	0.0217	0.0127	0.1442
<i>lfpr</i>	0.4843	0.0428	0.3742	0.5721
<i>rep</i>	0.2857	0.2857	0	1

While DA offices in NC have large caseloads, many of which are not disposed of in the year, the backlog of cases is growing over the sample period. Less than 2% of the cases go to trial and the typical case takes seven months to be disposed of. Districts vary significantly in population and racial composition. Just how prevalent is contested district attorney elections? As stated, each DA serves a four-year term. In North Carolina elections occur in every other year. Table 3 provides information on the elections in North Carolina.

Table 3: Prosecutor Elections in North Carolina								
	1998	2000	2002	2004	2006	2008	2010	total
# of elections	37	4	37	4	39	4	39	164
# of contested general	11	0	5	1	10	1	8	36
# of contested primary	7	2	9	0	12	1	3	34
# uncontested elections	19	2	25	3	21	2	30	102
# of vacancies ¹³	5	3	6	2	12	1	7	36

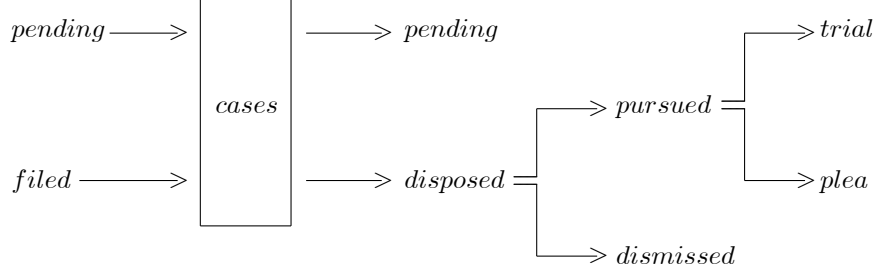
Contests are somewhat common. In 22.0% of the elections there was a contest in the general election, while in 20.7% of the elections there was a contest in a primary. The majority of the districts hold elections in a year different from the U.S. Presidential election, but as of the 2008 election 9.3% districts hold elections in the year of the Presidential election.

4 Results

Figure 3 is a flow chart of the handling of cases in a public prosecutor’s office for a year. The inflow consists of newly filed cases and the number of cases pending from the previous year. Each case is either disposed of during the year or left pending for the next year. Of those disposed, the charges can be either dismissed or a conviction can be “pursued”. If the prosecutor pursues a conviction in a case, she may either obtain a guilty plea or may take the case to trial. Bandyopadhyay and McCannon (2014b) have illustrated, also using data from North Carolina, that the distribution of the pursued cases is affected by re-election pressures - more cases are taken to trial relative to the total number of pursued cases. This analysis takes it a step further by looking at how this affects

¹³Information on whether an interim district attorney, appointed by the Governor, was running for election is not available. Thus, a seat is considered vacant if the individual, victorious in the previous election, did not run in either the primary or general election.

Figure 3: Caseload Flow Chart



the ability to process cases as a consequence of re-election pressures affecting the number of trials pursued.

Consider the effect of retention concerns on how many cases are disposed of and how many are left pending. If the election increases the size of the queue, then the number of cases left pending at the end of the year, *pending*, will be greater, *ceteris paribus*. Similarly, more cases will be left pending at the end of the year than were pending at the beginning of the year. Hence, the variable *backlog* will grow. Fixed effects specifications are estimated to control for the effects of year (e.g. macroeconomic shocks) and districts (e.g. office-specific information). Both *backlog* and *pending* are used as the dependent variable. If prosecutorial decisionmaking is invariant to the political cycle, then *CI* should have a statistically insignificant effect, while if elections provide incentives for effort exertion, then there should be a negative relationship between re-election pressure and cases pending and the backlog. Table 4 presents the fixed effects estimation results. HAC robust standard errors are reported in parentheses.

Table 4: Fixed Effects Results ($N = 441$)

	<i>backlog</i>	<i>pending</i>
<i>CI</i>	164.411 ** (68.164)	97.931 ** (43.398)
<i>reelect</i>	-113.154 ** (51.033)	16.207 (49.422)
<i>rep</i>	286.300 *** (95.330)	193.469 (155.488)
<i>filed</i>	0.2405 *** (0.0300)	0.6735 *** (0.0509)
<i>trial</i>	-0.7891 (0.6756)	-1.0194 (0.7133)
<i>age</i>	-0.9469 *** (0.3590)	3.5717 *** (0.5231)
<i>density</i>	-1.944 *** (0.3838)	0.5045 (0.8381)
<i>male</i>	3603.95 (7896.55)	10639.0 (12186.5)
<i>white</i>	1655.59 ** (804.191)	-1333.22 (1992.94)
%16 – 24	-6019.27 ** (3150.11)	6000.05 (4329.25)
<i>ur</i>	570.787 (1205.98)	1094.06 (1598.96)
<i>lfpr</i>	-702.936 (1739.76)	-364.597 (1163.81)
year effects?	YES	YES
adj R^2	0.121	0.968
F	1.92 ***	200.02 ***
AIC	6315.9	6111.1

* 10% level; ** 5% level; *** 1% level.

HAC robust standard errors are reported.

The results in Table 4 illustrate that re-election pressure, in the form of a challenger entering the race, increases the number of pending cases and the size of the case backlog. *CI* is positive and statistically significant in all specification. This coincides with the predictions of the theory that asymmetric information regarding the skills of the incumbent lead to distortions in the prosecutor's decisionmaking.

In both specifications *CI*, as stated, has a positive and statistically significant effect on the queue. Using the mean value of *backlog* of 66.551 from Table 2, the results imply that at the mean the number of unresolved cases increases by $(164.411 - 113.154) / 66.551 = 77.0\%$ if the incumbent is being challenged in her re-election campaign, as compared to districts in years without an incumbent running for re-election. Similarly, the number of pending cases at the end of the year increases by $(97.931 + 16.207) / 1543.1 = 7.4\%$ at the mean if the incumbent is being challenged in her re-election campaign. In other words, the number of unresolved cases is growing in North Carolina and the level as well as the rate of the increase accelerates when there are retention concerns. The entrance of a challenger has a substantial impact on the queue.

The coefficient on *reelect* is negative in the specifications with *backlog* as the dependent variable, which implies that uncontested incumbents accelerate the growth in the number of cases they dispose of relative to years and in districts without an election. While not reported here, this result is significant, though, only when year fixed effects are included. Thus, it is not robust to changes in the specification. The variable *reelect* is statistically insignificant when attempting to explain the absolute number of pending cases. Its exclusion, along with withholding the year effects (which are jointly insignificant in both specifications), increases the adjusted R^2 , the F -stat, and reduces the AIC. Hence, it is the entrance of a challenger when an incumbent is running for re-election that has the important effect on the queue.

Table 4 presents HAC-robust standard errors, as is common in panel-data analysis. Alternatively, if unadjusted, heteroskedasticity-robust, or clustered (by either district or by year) standard errors are calculated, the statistical significance of the coefficient on *CI* persists in both models. Additionally, an F -test of the linear restriction that the coefficients on *CI* and *reelect* sum to

zero rejects the null hypothesis that they are equal for the models with both *pending* and *backlog* as dependent variables. Thus, it is the re-election concern that expands case backlogs.¹⁴

The caseload variables are, as expected, important in explaining the queue. An increase in the number of filed cases increases the number of pending cases, which results from expanded demand for prosecutorial services, and increases the size of the backlog, which indicates an increasing returns to caseload pressures. The age of the cases disposed of has a negative and statistically significant impact on the backlog and a positive and statistically significant impact on the number of pending cases. Thus, a district in a year with older cases has more cases left pending at the end of the year since caseloads are large, but experiences a decrease in the size of the backlog since older cases are more likely to be disposed of as compared to newer cases. An F -test of the joint hypothesis that the caseload variables have no effect can be rejected ($p\text{-value} < 0.001$ in both specifications).

With regards to the socio-economic variables, an increase in the percentage of the district's population in a year that is between the ages of sixteen and twenty-four increases the number of pending cases, but decreases the case backlog. This can be explained by such districts having a higher case volume composed of more minor crimes, which increases the level of pending cases (the correlation between %16–24 and *trial* is -0.084 with a $p\text{-value}$ of 0.076), but are disposed of in short order and, therefore, does not affect the size of the backlog. The gender and racial distribution does not have much of an effect on the number of pending cases or the size of the increase in the case backlog. Neither does the labor market variables, *ur* and *lfpr*. Since fixed effect specifications are used,

¹⁴The alternative standard error calculations are done on the Pooled OLS specification including caseload and socio-economic controls, along with district and year effects. Similarly, the F -test are done on the Pooled OLS base model including the caseload and socio-economic controls.

changes in these variables within a district are unimportant to understanding changes in the queue in these districts, but rather, differences between districts have a significant influence.¹⁵ An F -test of the joint hypothesis that the socio-economic variables are insignificant can be rejected ($p\text{-value} < 0.01$) in the first but not the second specification.

There are two additional considerations. First, the dependent variables are measured in absolute terms. The districts, though, vary substantially in size. The population of the districts range from only 55,135 to as large as 900,068 and the total caseloads (the newly filed plus the number of cases pending from the previous year) range from 730 cases to be dealt with in a district in a year to 17,828. Hence, estimations with the dependent variables normalized by the total caseload, *backrate* and *pendrate* are considered. Second, the district fixed effects are (jointly) significant determinants of the case queue. It seems reasonable to presume that unobservable determinants of the case backlog may be correlated with the district effects so that the error term is correlated with the district in which the cases are being dealt with. Hence, random effects specifications are conducted as a robustness check. Table 5 presents the results.

Table 5: Additional Results ($N = 441$)

¹⁵In a Pooled-OLS specification including only the caseload and socio-economic variables *density*, *white*, and %16 – 24 are all statistically significant explanatory variables of *backlog*.

	FE <i>backrate</i>	FE <i>pendrate</i>	RE <i>backlog</i>	RE <i>pending</i>
<i>CI</i>	0.0360 * (0.0187)	0.0321 ** (0.0122)	161.012 ** (72.114)	104.765 * (60.859)
<i>reelect</i>	-0.0199 (0.0143)	-0.0053 (0.0106)	-43.429 (41.056)	-10.7318 (33.388)
controls:				
caseload	YES	YES	YES	YES
socio-economic	YES	YES	YES	YES
year	YES	YES	NO	NO
adj R^2	0.113	0.706		
F	1.85 ***	17.02 ***		
AIC	-1026.6	-1317.8	6297.1	6689.5

* 10% level; ** 5% level; *** 1% level.

HAC robust standard errors are reported in **FE**.

The sign and significance of *CI* is maintained when the queue variables are normalized by the size of the caseloads. An F -test of the joint null hypothesis that the district fixed effects are zero is rejected ($p\text{-value} < 0.001$) in the first two specifications. Likewise, the importance of a contested re-election campaign is confirmed in the random effects specifications. A Hausman test fails to reject the null hypothesis of consistent estimates ($p\text{-value} < 0.001$) for both the third and fourth specifications.

A number of robustness checks are conducted. First, as described in the previous section, four districts were each divided within the sample period. Hence, the results presented use an unbalanced panel. The results, though, are not sensitive to the deletion of these districts to create a balanced panel. Also, three districts in North Carolina are significantly larger than the rest. The populations are greater and the total number of cases to be dealt with are substantial. One may expect the elected, chief prosecutor in smaller districts to have more of an influence in the decisionmaking within each case and, therefore,

case disposition may be different than these large districts.¹⁶ The significance of *CI* is maintained and the magnitude of the coefficient is greater when the three large districts are omitted. Hence, the results of Table 4 are not sensitive to the use of an unbalanced panel or the inclusion of large districts. These additional results are available upon request.

Another concern is that the caseload variables suffer from potential problems of reverse causality. First, the value of *filed* is exogenous since it is uncorrelated with the election variables and is expected to be determined primarily by the number of crimes committed and the amount invested in law enforcement. The number of trials and the age of the cases are expected to be endogenously determined by the prosecutor responding to his/her incentives. Eliminating *trial* and *age* from the specifications presented in Tables 4 and 5 do not substantially affect the sign, magnitude, and statistical significance. Hence, their inclusion does not affect the main results. Similarly, while the number of trials undertaken by the prosecutor may lead to an increase in the backlog due to less time and resources available to dispose of other cases, a large number of pending cases may lead a prosecutor to reduce the number of trials. Hence, there may be reverse causality. There is evidence of this reverse causality in the observation that *trial* has a negative coefficient in each of the specifications in Table 4. Under an assumption of sequential exogeneity, lagged values of *trial*, *triallag*, are expected to be correlated with *trial*, but have no effect on the number of unresolved cases at the end of the year. The correlation between *triallag* and *trial* is 0.8106 ($p\text{-value} < 0.001$). Similarly, if a district in a year has a number of older cases, then they may be given priority in the office and less attention is given to newer cases, which may lead to an increase in the case backlog. Alternatively, as the queue grows the time it takes each case to be resolved, on

¹⁶ Alternatively, those in larger districts may be more politically-motivated looking to move into a statewide office (e.g. attorney general or governor).

average, expands. Hence, the case backlog may lead to an aging of the cases. Again, under an assumption of sequential exogeneity, previous values of *age*, *agelag*, are correlated with the age of the current period's cases (the correlation between *age* and *agelag* is 0.8069 with a *p-value* < 0.001), but not with the number of cases left pending at the end of the current term. Hence, *agelag* and *triallag* can be used as instruments in 2SLS. This method is employed in Dimitrova-Grajzl, Grajzl, Sustersic, and Zujc (2012b) estimating the impact of an expansion in the number of judges on case backlogs in Slovenia.

Table 6 presents the second-stage results. Each specification includes a constant term, *filed*, the socio-economic variables, and uses *triallag* and *agelag* as instruments.

Table 6: 2SLS Results ($N = 396$)				
	<i>backlog</i>	<i>backrate</i>	<i>pending</i>	<i>pendrate</i>
<i>CI</i>	155.496 ** (73.474)	0.0351 * (0.0183)	270.861 ** (107.056)	0.0482 *** (0.0172)
<i>reelect</i>	-42.469 (41.563)	-0.0042 (0.0103)	-54.412 (60.560)	-0.0075 (0.0097)
adj R^2	0.043	0.018	0.886	0.434
F	2.52 ***	1.63 ***	255.16 ***	22.45 ***
AIC	17473.3	10897.3	17711.8	10836.4

* 10% level; ** 5% level; *** 1% level.

HAC robust standard errors are reported.

While the number of observations is reduced, since one less year can be used in the estimation, the results of Table 6 confirm those of Tables 4 and 5. An incumbent challenged in his/her re-election campaign increases the number of cases left pending and increases the growth of the case backlog. The statistical significance of *CI* is improved with the correction for reverse causality. The

significance of *reelect* is lacking, which implies that the important effect of election concerns is the presence of a challenger.

The previous results indicate that, while the “inflows” during the challenged re-election year do not change (the correlation between *CI* and *filed* is -0.058 and the number of cases left pending from the previous year is -0.056), there is an increase in the number of cases left pending at the end of the year. As illustrated in Figure 1, the increase in the number of pending cases must coincide with a decrease in the number of disposed cases. The question becomes where does this reduction come from. Are fewer cases dismissed or are fewer convictions pursued?

The dependent variable to consider, therefore, is the proportion of disposed cases that are dismissed, *dismiss*. If a re-election campaign does not cause distortions to prosecutors’ decisionmaking, then one would not expect change in the distribution of disposed cases. If the incumbent is ramping up her convictions to be retained, then one would expect election pressures to decrease this proportion. Table 7 presents results. Both fixed effects and random effects specifications are reported.

Table 7: Results (dep. var. = *dismiss*, $N = 441$)

	FE	FE	RE
<i>CI</i>	-0.0150 *	-0.0174 **	-0.0151 *
	(0.0079)	(0.0080)	(0.0084)
<i>reelect</i>	0.0122 *	0.0054	0.0041
	(0.0065)	(0.0042)	(0.0046)
controls:			
caseload	YES	YES	YES
socio-economic	YES	YES	YES
year	YES	NO	NO
adj R^2	0.769	0.772	
F	23.21 ***	27.61 ***	
AIC	-1732.9	-1746.9	-1082.3

* 10% level; ** 5% level; *** 1% level.

HAC robust standard errors are reported in FE.

In the fixed effects model, an F -test of the joint null hypothesis that the district effects have a common intercept can be rejected ($p\text{-value} < 0.001$) and a Wald test for the joint significance of the time effects rejects their significance ($p\text{-value} > 0.10$). In the random effects model, a Hausman test fails to reject the hypothesis of consistent estimates ($p\text{-value} < 0.001$).

The results illustrate that if an incumbent is running for re-election, then there is an decrease in the number of dismissed cases relative to the number of cases disposed of. Thus, the reduction in disposed cases comes at the expense of fewer dismissed cases. This coincides with the findings of Dyke (2007). Also, there is weak evidence that an unchallenged incumbent running for re-election increases the number of cases dismissed. Since it was shown that there is no change in the number of cases left pending at the end of the year (Tables 4 and 5), this implies there is a reduction in the number of convictions pursued by those without a contest.

5 Conclusion

Two competing theories are developed to understand how electoral incentives affect prosecutor decisionmaking to, in particular, analyze its impact on case backlogs. We test the implications of the two theories by empirically investigating the impact of elections on the queue. Incumbents who face contested elections leave more cases unresolved. Consequently, the backlog grows. The results are consistent with the asymmetric information theory of signaling (with no slack resources), rather than with increased effort exertion.

There are some issues in the analysis worth clarifying. For instance, one may be concerned with the potential endogeneity problem of candidate entry.

This would matter if an unobservable variable drove both entry and backlogs. However, we do not believe it affects the main results presented here. First, Bandyopadhyay and McCannon (2014b) analyze similar data from North Carolina to address the decision to plea bargain or take a case to trial. Using entry into judicial races as an instrument, they show that potential endogeneity effects from candidate entry in prosecutor races do not affect their results. Second, as is discussed in the text, the combined effect of *CI* and *reelect* is positive with both dependent variables. Thus, regardless of entry into the race, re-election concerns extend backlogs and, consequently, the main results are not driven by the decision to challenge the incumbent. The welfare effects of elections are however not clear. Does the increased deterrence from more courtroom prosecutions outweigh the cost to extended queues, along with public financing concerns? The empirical analysis cannot provide a full welfare analysis. Finally, there are numerous other decisions made by a prosecutor not considered here. For example, the effect of election pressures on which charges to file, the practices of charge-bargaining versus sentence-bargaining, and the production of non-prosecution services have not been considered. Also, future work should consider the diffusion process within an office between election incentives of the chief DA (as the principal) and the ADAs, as agents.

The research contributes towards the broader issue of optimal institutional design within the legal system. Should prosecutors be selected through popular, partisan elections, as is done in most states within the U.S., or should they be appointed as are U.S. Attorneys as well as prosecutors throughout, for example, Europe? A complementary analysis of the incentive effects of appointment systems is needed to fully address this issue. The current work, though, provides some insight into the way this affects prosecutor decisionmaking. Our analysis suggests that prosecutor behavior in the United States is consistent with sig-

naling via increased use of courtroom trials. Consequently, this leads to case backlogs increasing, implying longer queues to be served in the criminal justice system.

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