APPENDIX

A. JUDICIAL MULTITASK MODEL

Suppose that the judge chooses between two actions, a_1 and a_2, where the first action tends to expedite the case, and the second action tends to enhance procedural fairness. For example, a_1 might correspond to a pre-trial conference, and a_2 may correspond to granting additional time for discovery. Both actions are personally costly to the busy federal judge. The judge's cost function is

$$c(a_1, a_2) \tag{7}$$

where $\frac{\partial c}{\partial a_1} > 0$, $\frac{\partial^2 c}{\partial a_1^2} > 0$, and $\frac{\partial^2 c}{\partial a_2^2} > 0$. That is, the judge's private cost is increasing and convex in both actions.

These actions generate judicial output according to

$$x_1 = a_1 + \varepsilon_1 \tag{8}$$

$$x_2 = a_2 + \varepsilon_2, \tag{9}$$

where x_1 is inversely related to the judge's average motion processing time, and x_2 represents the substantive and the overall procedural fairness of her decisions. The individual judge's contribution to social welfare W is a function of both types of judicial output:

$$W = \phi_1 x_1 + \phi_2 x_2 \tag{10}$$

Among the most important features of the model is that, while x_1 is perfectly observable, x_2 is unobserved. That is, while the Congress and the Federal Judiciary can easily monitor a judge's average time-to-disposition as well as her disposition time on individual cases and motions, it is difficult to monitor her substantive or procedural fairness. The latter generally requires appellate review, which is both costly and subject to error in its own right.

Seeking to incentivize that which can be observed, judges are promoted with probability $p = \bar{p} + \beta x_1 + \nu$. That is, the probability of promotion increases linearly with the inverse of the judge's average motion processing time, and β represents the strength of the judge's incentives. For example, the introduction of the 6-month list, which tends to incentivize speed, would represent an increase the value of β.

The federal district judge chooses her actions a_1 and a_2 in order to maximize her private utility from promotion net of her private costs:

$$\max_{a_1,a_2} U(a_1,a_2) = u\left(p(a_1,a_2)\right) - c(a_1,a_2), \tag{11}$$

which yields the first order conditions:

$$[a_1] : \beta = \frac{\partial c(a_1,a_2)}{\partial a_1}$$
$$[a_2] : \frac{\partial c(a_1,a_2)}{\partial a_2} * a_2 = 0$$

If the cost of a_2 is always positive–that is, if $\frac{\partial c}{\partial a_2} > 0$–then the model yields a corner solution where the judge never expends any effort at procedural fairness. Instead, suppose that $\frac{\partial c(a_1,a_2=0)}{\partial a_2} \leq 0$, yielding an interior solution. That is, as long as efforts at fairness are costless at certain minimal levels, then the judge will expend some effort in that direction. Further suppose that actions a_1 and a_2 are substitutes, so that $\frac{\partial c^2(a_1,a_2)}{\partial a_1 \partial a_2}$. This seems like a reasonable assumption, given that actions tending to enhance procedural fairness will often tend to slow down an action and make speedy disposition more costly.

The key question is how the judge's behavior (namely, her choice of actions a_1 and a_2) responds to the strength of her incentives β. Differentiating her first order conditions with respect to β yields:

$$\frac{\partial a_1^*}{\partial \beta} > 0$$
$$\frac{\partial a_2^*}{\partial \beta} < 0$$

In other words, when x_1 is observable, x_2 is unobservable, and actions a_1 and a_2 are substitutes, high-powered incentives like the 6-month list will tend to increase investment in speed and decrease investment in procedural fairness.

1. *Incorporating Judge Procrastination*

The goal of this model is to evaluate how a present-biased responds to incentives similar to those generated by the six-month list. The model borrows much of its architecture from other models used to study the effects of final[127] or interim deadlines[128] on the behavior of present-biased agents. The six-month list, however, imposes a somewhat unique choice structure with similarities to both final and interim deadlines. The six-month list is similar to an interim deadline in the sense that it is non-binding—much like a student subject to an interim deadline for submitting a rough draft of a writing assignment, the judge is free to allocate her effort across the deadline, even if it triggers an appearance on the six-month list. However, if she chooses to discontinue her work in order to avoid an appearance on the six-month list, then her work becomes final, and it is too late to invest effort in order to improve it.

I will start by introducing a basic model of a judge subject to present-bias (i.e. procrastination). After establishing the framework, I will consider the likely effects of implementing a six-month list-style regime. Suppose a judge a required to enter an order disposing of a single motion. She has two periods $t \in \{1,2\}$ during which to work on the order. At the end of period 1, she may choose to either continue working on the order during period 2, or she may discontinue her work and enter the order immediately. For each period that she works on the order, she chooses an effort level $e_t \geq 0$ for which she incurs a cost of $c(e_t)$ where $c'(\cdot) > 0$ and $c''(\cdot) > 0$. The judge is rewarded for her efforts in period 3, where her probability of promotion $p\left(\sum_{t=1}^{2} e_t + \varepsilon\right)$ is strictly increasing and in her total effort invested in the order ($p'(\cdot) > 0$; $p''(\cdot) < 0$). The noise term ε reflects the inherently imperfect observability of a judge's effort on any single motion. The judge's intertemporal preferences are given by a standard hyperbolic discounting utility function:

$$U_t(u_t, u_{t+1}, \ldots, u_T) = u_t + \beta \sum_{\tau=t+1}^{T} \delta^{\tau-t} u_\tau,$$

where u_t represents the judge's instantaneous utility in period t, $\delta \in [0,1]$ represents a time-consistent (i.e. exponential) discount factor, and $\beta \in [0,1]$ denotes the degree of the judge's time-inconsistent present bias. For conve-

[127] *See, e.g.*, Ted O'Donoghue & Matthew Rabin, *Incentives for Procrastinators*, 114 Q. J. ECON. 769 (1999).

[128] *See, e.g.*, Fabian Herweg & Daniel Muller, *Performance of Procrastinators: on the Value of Deadlines*, 70 THEORY & DECISION 329 (2011); Ted O'Donoghue & Matthew Rabin, *Incentives and Self-Control* (2005) (unpublished working paper).

nience, we will assume that the judge's has a time-consistent discount factor of $\delta = 1$.

First we consider a regime without the six-month list. In the first period the judge chooses an actual first-period effort level e_1, decides whether to continue working in period 2, and conditional on choosing to continue, chooses a planned second-period effort level e_2. The judge's first-period intertemporal utility function is given by

$$U_1 = \max\{-c(e_1) + \beta p(e_1), -c(e_1) - \beta c(e_2) + \beta p(e_1 + e_2)\}. \tag{12}$$

The judge's second-period intertemporal utility function, which depends upon whether she chooses to continue working in period 2, is given by

$$U_2 = \begin{cases} \beta p(e_1) \text{ if judge discontinues work} \\ -c(e_2) + \beta p(e_1 + e_2) \text{ if judge continues work} \end{cases} \tag{13}$$

Time-Consistent Judge First we consider a time-consistent judge. For a time-consistent agent, $\beta = 1$, which reflects an absence of present-bias. Since a time-consistent judge's preferences do not change over time, she is able to commit to whichever future course of action maximizes U_1. She continues working in the second period if $-c(e_1^*) - c(e_2^*) + \beta p(e_1^* + e_2^*) > -c(\tilde{e_1}) + p(\tilde{e_1})$, where $\{e_1^*, e_2^*\} = \arg\max_{e_1,e_2} -c(e_1) + p(e_1), -c(e_1) - c(e_2) + p(e_1 + e_2)$ and $\{\tilde{e_1}\} = \arg\max_{e_1} -c(e_1) + \beta p(e_1)$. Assuming that she continues working into the second period, the judge's optimal sequence of effort is characterized by the first-order conditions

$$c'(e_1) = c'(e_2) = p(e_1 + e_2). \tag{14}$$

That is, the judge invests the same in both periods. Moreover, due to the convexity of the cost curve, it can be shown that the judge will always prefer to continue working after the first period so that she may smooth her effort across two periods.

2. Present-Biased Judge

Next we consider a present-biased judge. We will assume for sake of simplicity that the judge is naive to her time-inconsistent preferences; the main results extend to the case of a sophisticated judge. The severity of the judge's present-bias is reflected by $\beta \in (0, 1]$.

In the first period, the naive agent chooses her actual first-period effort e_1^* and her planned second-period effort $\widehat{e_2^*}$ in order to maximize U_1. She continues working after the first period if $-c(e_1^*) - \beta c(\widehat{e_2^*}) + \beta p(e_1^* + \widehat{e_2^*}) >$

$-c(\tilde{e_1}) + p(\tilde{e_1})$. The naive judge will always choose to continue working in the second period due to both the convexity of the cost function and the perceived lower cost of effort in the second period. Actual first-period effort e_1^* and planned second-period effort $\widehat{e_2^*}$ are characterized by the first order conditions

$$\begin{aligned} c'(e_1^*) &= \beta g'\left(e_1^* + \widehat{e_2^*}\right) \\ c'(\widehat{e_2^*}) &= p'\left(e_1^* + \widehat{e_2^*}\right). \end{aligned} \tag{15}$$

In the second period the judge is surprised to learn that her current effort is no less costly than it was in the previous period. The judge therefore re-optimizes in the second period, with her actual second-period effort e_2^* being characterized by

$$c'(e_2^*) = \beta p'(e_1^* + e_2^*). \tag{16}$$

3. *Implementing the Six-Month List*

Next I will modify my model to incorporate a policy like the six-month list. Before the imposition of the six-month list, a judge's probability of promotion depended only upon the effort she exerted plus a random noise term.

$$p(e_1, e_2) = \begin{cases} g(e_1 + \varepsilon) \\ g(e_1 + e_2 + \varepsilon) - B, \end{cases} \tag{17}$$

where $g(\cdot)$ is strictly increasing and concave in effort e and the constant B reflects a punishment for judges whose motions appear on the six-month list. In other words, a judge is free to continue working in the second period if she chooses, but the cost of doing so is a predictably lower probability of future promotion.

Proposition: For a naive or sophisticated present-biased judge, $\exists$ incentive B such that a non-complying judge (who continues working in the second period) becomes a complying judge (who concludes work in period one).

Proposition: For a naive or sophisticated present-biased judge, total effort is weakly decreasing with compliance.

Proposition: For a naive or sophisticated present-biased judge, for a given incentive B, compliance with the six-month list is increasing in the variance of $epsilon$.

B. ADDITIONAL TABLES & FIGURES

Figure 16: **Excerpt from the CJRA six-month report for the period ending September 30, 2016**

CJRA Table 8—Report Of Motions Pending Over Six Months
For Period Ending September 30, 2016

DC Circuit

District Judge BATES, JOHN D.

Office	Docket Number	NOS Code	Case Title	Motion Text	CJRA Deadline	Status	Status Description
1	15-cv-01945	360	OWENS et al v. BNP PARIBAS S.A. et al	MOTION to Dismiss	08/30/2016	B	Opinion/Decision in Draft
						Q	Complexity of Case
				MOTION for Summary Judgment	09/03/2016	B	Opinion/Decision in Draft
						Q	Complexity of Case

Table 10: **Comparison of Means: Known vs. Unknown Dispositions Summary Judgment Motions, All Civil Cases (2005-2014)**

	(1) Unknown Disposition	(2) Known Disposition	(3) Difference in Means
Reporting Time (months)	10.03	10.00	-0.03
	(1.74)	(1.75)	[0.02]
% Filed by Pltf.	0.28	0.30	0.01
	(0.45)	(0.46)	[0.02]
% Filed by Deft.	0.61	0.63	0.02
	(0.49)	(0.48)	[0.02]
% Pro Se	0.17	0.18	0.02
	(0.37)	(0.39)	[0.01]
% I.F.P.	0.14	0.17	0.03
	(0.35)	(0.38)	[0.01]**
% Prisoner Rights	0.10	0.11	0.01
	(0.30)	(0.31)	[0.01]
% Employment Discrim.	0.09	0.12	0.03
	(0.28)	(0.32)	[0.01]***
% Personal Injury	0.18	0.09	-0.09
	(0.38)	(0.28)	[0.06]
% Soc. Sec.	0.08	0.12	0.04
	(0.28)	(0.33)	[0.01]***
N	225,276	250,564	475,840

This table presents a comparison of means between summary judgment motions with known and unknown dispositions. Columns (1) and (2) show sample means with standard deviations in parentheses, and column (3) shows differences in means with standard errors in brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: **Effect of Reporting Time on Months Until Motion Disposition Individual Reporting Month Dummies**

	(1)	(2)	(3)	(4)
8-9 Months Reporting Time	0.215***	0.189***	0.204***	0.255***
	(0.027)	(0.033)	(0.033)	(0.036)
9-10 Months Reporting Time	0.364***	0.394***	0.398***	0.362***
	(0.026)	(0.033)	(0.033)	(0.035)
10-11 Months Reporting Time	0.508***	0.515***	0.523***	0.526***
	(0.027)	(0.029)	(0.029)	(0.029)
11-12 Months Reporting Time	0.637***	0.618***	0.632***	0.674***
	(0.027)	(0.035)	(0.035)	(0.037)
12-13 Months Reporting Time	0.628***	0.655***	0.644***	0.611***
	(0.027)	(0.033)	(0.032)	(0.034)
Observations	250,063	250,063	250,057	250,057
Case & Motion Controls	Yes	Yes	Yes	Yes
Calendar Trends		Yes	Yes	Yes
District*Year FEs			Yes	Yes
Day-of-Month FEs				Yes
Mean of Dep. Var.	5.32	5.32	5.32	5.32
Mean of Indep. Var.	10.0	10.0	10.0	10.0

This table presents OLS estimates of the effect of additional reporting time on months until motion disposition. Reporting time is measured in the number of months between the day on which a motion was filed and the earliest possible date on which it could appear on a CJRA 6-month report. All columns include basic case- and motion-level controls, including a dummy for the party (plaintiff or defendant) filing the motion and nature-of-suit, judge, district, and filing-year fixed effects. Robust standard errors are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

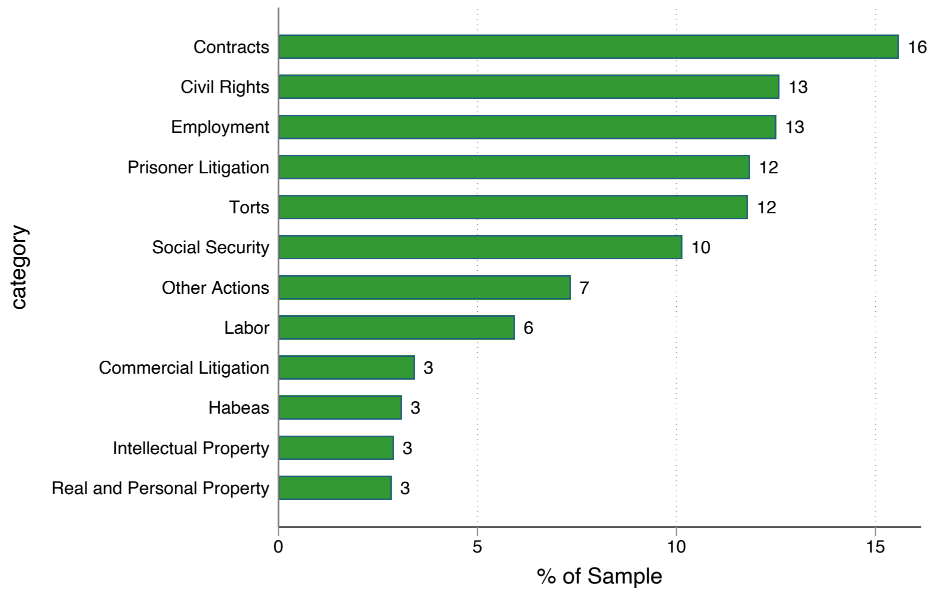
Table 12: **Effect of Reporting Time on Months Until Case Disposition Individual Reporting Month Dummies**

	(1)	(2)	(3)	(4)
8-9 Months Reporting Time	0.050	-0.128	-0.115	0.061
	(0.109)	(0.146)	(0.145)	(0.170)
9-10 Months Reporting Time	0.027	0.372^{**}	0.416^{***}	0.244
	(0.107)	(0.149)	(0.148)	(0.167)
10-11 Months Reporting Time	0.116	0.289^{**}	0.312^{***}	0.301^{***}
	(0.109)	(0.117)	(0.116)	(0.116)
11-12 Months Reporting Time	0.389^{***}	0.367^{**}	0.367^{**}	0.522^{***}
	(0.108)	(0.154)	(0.153)	(0.175)
12-13 Months Reporting Time	0.210^{**}	0.407^{***}	0.457^{***}	0.280^{*}
	(0.107)	(0.146)	(0.145)	(0.167)
Observations	183923	183923	183887	183887
Case & Motion Controls	Yes	Yes	Yes	Yes
Calendar Trends		Yes	Yes	Yes
District*Year FEs			Yes	Yes
Day-of-Month FEs				Yes
Mean of Dep. Var.	23.38	23.38	23.37	23.37
Mean of Indep. Var.	10.04	10.04	10.04	10.04

This table presents OLS estimates of the effect of additional motion reporting time on months until overall case disposition. Reporting time is measured in the number of months between the day on which a motion was filed and the earliest possible date on which it could appear on a CJRA 6-month report. All columns include basic case- and motion-level controls, including a dummy for the party (plaintiff or defendant) filing the motion and nature-of-suit, judge, district, and filing-year fixed effects. Robust standard errors are in parentheses.

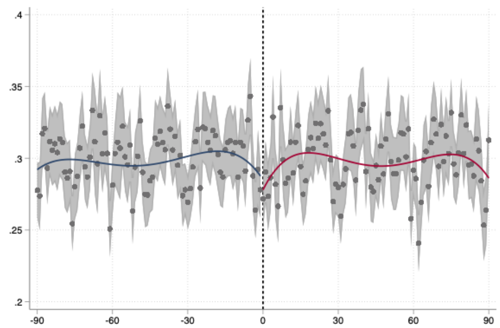
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 17: **Distribution of Case Types**

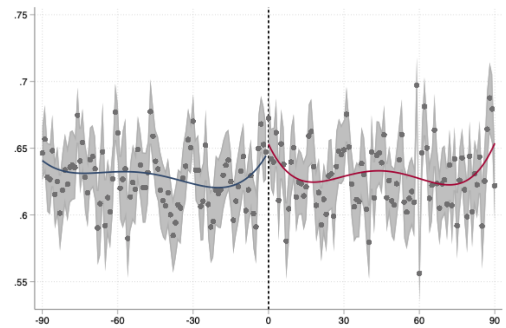


Note: Category "Other" includes miscellaneous statutory claims, tax-related claims, certain employment rights claims, as well as a wide variety of other case types.

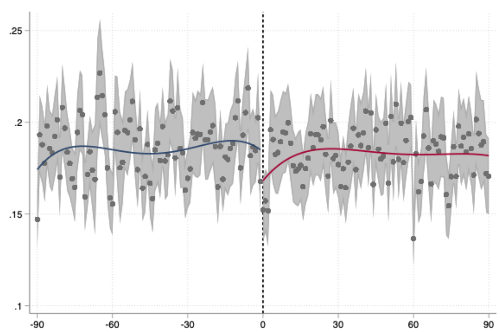
Figure 18: **Distribution of Covariates Across Filing Date Cutoffs**



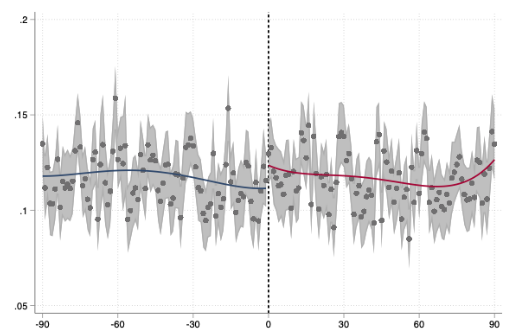
(a) % Motions filed by Plaintiff



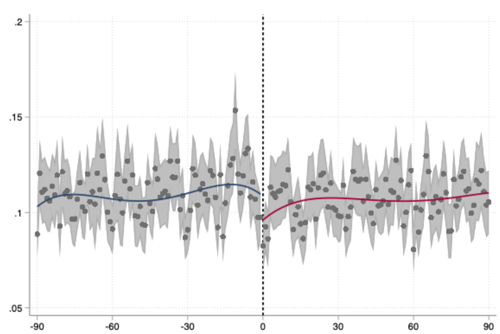
(b) % Motions filed by Defendant



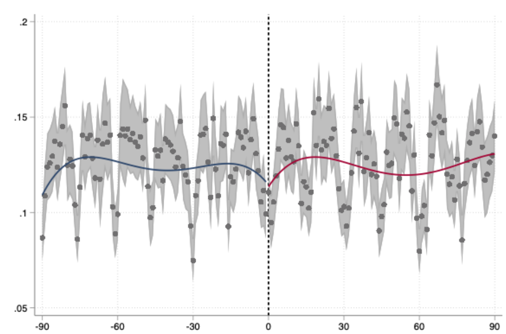
(c) % Filed Pro Se



(d) % Employment Discrimination Cases

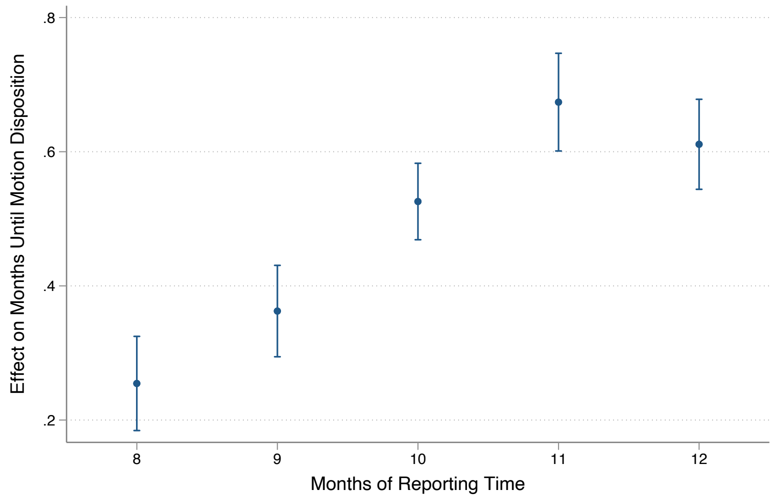


(e) % Prisoner Rights Cases

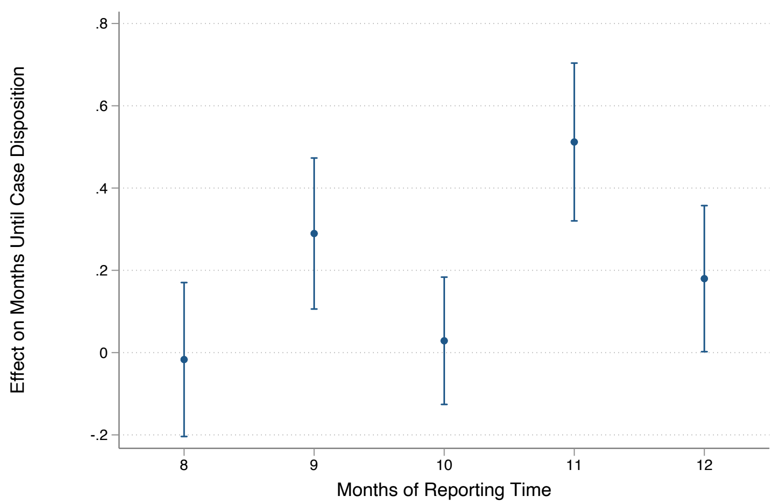


(f) % Social Security Cases

Figure 19: **Effect of Reporting Time on Months Until Disposition**

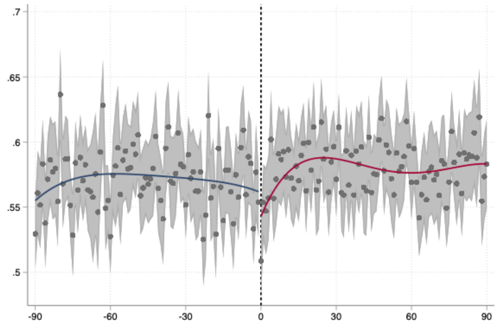


(a) Motion Disposition

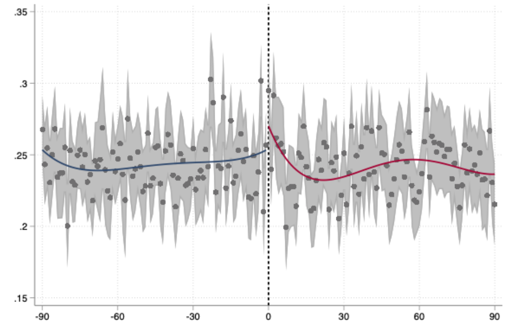


(b) Overall Case Disposition

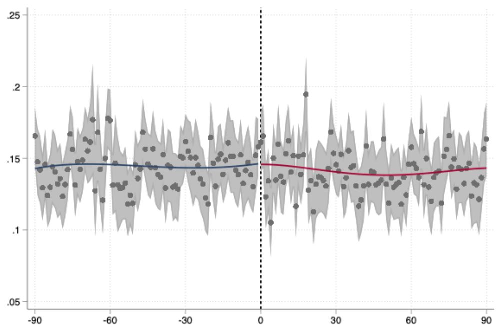
Figure 20: **Regression Discontinuity Plots of Motion and Appellate Outcomes**



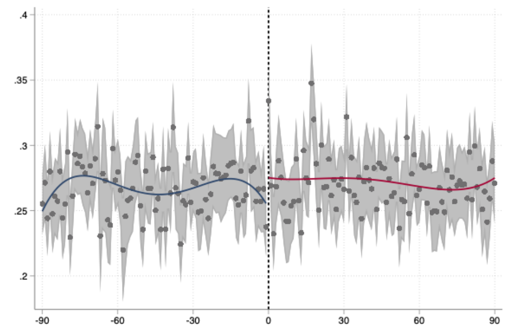
(a) % Granted



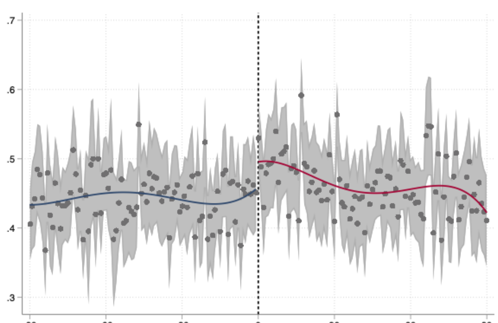
(b) % Denied



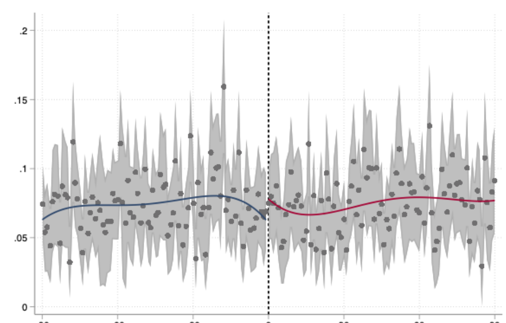
(c) % Granted in Part



(d) % Appealed



(e) % Affirmed



(f) % Reversed

Table 13: **Regression Discontinuity Estimates of Effect of Reporting Time on Motion-Level Outcomes**

Sample: Motions filed by Defendants Only					
	Parametric			Local Linear	
	(1) Linear	(2) Quadratic	(3) Cubic	(4) MSE	(5) CER
			Motion Granted		
Filed After Cutoff	0.007	0.006	-0.010	-0.031***	-0.029**
	[0.005]	[0.007]	[0.010]	[0.011]	[0.014]
Mean of Dep. Var.	.57	.57	.57	.57	.57
Observations	156,230	156,230	156,230	156,230	156,230
			Motion Denied		
Filed After Cutoff	-0.006	-0.007	0.008	0.032***	0.021
	[0.004]	[0.006]	[0.009]	[0.011]	[0.015]
Mean of Dep. Var.	.24	.24	.24	.24	.24
Observations	156,230	156,230	156,230	156,230	156,230
			Motion Granted in Part		
Filed After Cutoff	-0.000	0.003	0.001	-0.005	-0.001
	[0.004]	[0.005]	[0.007]	[0.007]	[0.009]
Mean of Dep. Var.	.14	.14	.14	.14	.14
Observations	156,230	156,230	156,230	156,230	156,230

This table presents regression discontinuity (RD) estimates of the effect of additional reporting time on motion-level outcomes, including whether the motion was granted, denied, or granted in part. All samples are restricted to motions filed by defendants. The running variable represents the motion filing date relative to the six-month list eligibility cutoff. Motions filed just before the cutoff are eligible for the current six month list, whereas motions filed just after the cutoff have an additional six months before they might appear on a list. Columns (1)-(3) are estimated parimetrically with linear, quadratic, and cubic polynomials, respectives. Columns (4)-(5) are estimated nonparametrically with local linear regressions, using mean-squared error (MSE) and coverage error rate (CER) optimal methods of optimal bandwidth selection, respectively. All columns include basic case- and motion-level controls, including nature-of-suit, judge, district, and filing-year fixed effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: **Regression Discontinuity Estimates of Effect of Reporting Time on Appellate Outcomes**

Sample: Motions filed by Defendants Only					
	Parametric			Local Linear	
	(1) Linear	(2) Quadratic	(3) Cubic	(4) MSE	(5) CER
			Appeal Filed		
Filed After Cutoff	0.012***	0.012*	0.014	0.056***	0.062***
	[0.005]	[0.007]	[0.009]	[0.011]	[0.015]
Mean of Dep. Var.	.27	.27	.27	.27	.27
Observations	156,230	156,230	156,230	156,230	156,230
			Affirmed on Appeal		
Filed After Cutoff	0.049***	0.063***	0.075***	0.074***	0.064***
	[0.010]	[0.014]	[0.019]	[0.019]	[0.024]
Mean of Dep. Variable	.45	.45	.45	.45	.45
Observations	42,173	42,173	42,173	42,173	42,173
			Reversed on Appeal		
Filed After Cutoff	-0.012**	-0.005	-0.001	0.006	0.003
	[0.005]	[0.007]	[0.010]	[0.010]	[0.013]
Mean of Dep. Variable	.07	.07	.07	.07	.07
Observations	42,173	42,173	42,173	42,173	42,173

This table presents regression discontinuity (RD) estimates of the effect of additional reporting time on various appellate outcomes, including whether an appeal was filed subsequent to an order on the motion, whether the lower-court judgment was affirmed on appeal, and whether the lower-court judgment was reversed. All samples are restricted to motions filed by defendants. The running variable represents the motion filing date relative to the six-month list eligibility cutoff. Motions filed just before the cutoff are eligible for the current six month list, whereas motions filed just after the cutoff have an additional six months before they might appear on a list. Columns (1)-(3) are estimated parimetrically with linear, quadratic, and cubic polynomials, respectives. Columns (4)-(5) are estimated nonparametrically with local linear regressions, using mean-squared error (MSE) and coverage error rate (CER) optimal methods of optimal bandwidth selection, respectively. All columns include basic case- and motion-level controls, including nature-of-suit, judge, district, and filing-year fixed effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 15: **Proportional Hazard Analysis: Effect of Reporting Time on Motion Survival**

	(1)	(2)
8-9 Months until Report	0.980**	0.946***
	[0.008]	[0.010]
9-10 Months until Report	0.922***	0.900***
	[0.008]	[0.010]
10-11 Months until Report	0.913***	0.847***
	[0.007]	[0.009]
11-12 Months until Report	0.898***	0.798***
	[0.007]	[0.008]
12-13 Months until Report	0.894***	0.808***
	[0.007]	[0.008]
Observations	420,535	420,212
Survival Model	Cox	Cox
Stratified by NoS, Judge, District, & Filing-Year		Yes
Mean Months Motion Open	6.21	6.21
Mean Reporting Time (months)	10.05	10.05

This table presents hazard ratios for individual reporting month dummies (relative to a baseline hazard rate for motions with fewer than eight months of reporting time). All columns include basic case- and motion-level controls, including calendar day time trends, dummies for the moving party, and a dummy for whether previous summary judgment motions have been filed in the same case. Column (2) is also stratified to allow for independent baseline hazard rates by nature-of-suit, judge, district, and filing-year.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$