September 15, 2021 Meeting Document

September 14, 2021

1 Overview

This week I tried a couple more models to estimate the service rate. I tried the all-time min iterative model we discussed as well as a county fixed effects model, I have updated our results table to include them. An overview of the results are below.

Pleas per Day Model Group Days per Trial Min County 6.924.416.28Min Judge 9.66Judge-County Min 14.974.25All time Min County 7.12 3.65All time Min Judge 16.534.52All time Min Judge-County 15.054.09Utilization County 7.563.25Utilization Judge 13.99 3.12 Utilization Judge-County 20.90 1.73 Fixed Effects Judge 9.523.86

10.99

10.1

4.34

3.71

Table 1: Summary of Results

2 Iterative Idleness Estimation Taking All Time Mins

Judge-County

County

Step 0: We estimate the model, $\operatorname{Days}_j = \beta_t \operatorname{Trial}_j + \beta_p \operatorname{Plea}_j + \epsilon_j$.

Fixed Effects

Fixed Effects

Steps 1-n: We then use the estimates of $\beta_t^{(1)}$ and $\beta_p^{(1)}$ to estimate the expected number of days it would take each judge to complete their work. Mathematically: Expected $\operatorname{Days}_j^{(1)} = \beta_p^{(1)} \cdot \operatorname{Plea}_j + \beta_t^{(1)} \cdot \operatorname{Trial}_j$. We would then set $\operatorname{Days}_j^{(n)} = \min(\operatorname{Days}_j, \operatorname{Expected Days}_j^{(n-11)}, ..., \operatorname{Expected Days}_j^{(1)})$. We then estimate the model $\operatorname{Days}_j^{(1)} = \beta_t \operatorname{Trial}_j + \beta_p \operatorname{Plea}_j + \epsilon_j$ and repeat until convergence.

2.1 Judge Model

Table 2: Judge Model

Dep. Varia	ble:	У	R-s	quared:		1.000
Model:		OLS	\mathbf{Ad}	j. R-squ	ared :	1.000
Method:	-	Least Squa	\mathbf{res} \mathbf{F} - \mathbf{s}	tatistic:		1.813e + 30
Date:	T	ue, 14 Sep 2	2021 Pro	b (F-sta	atistic):	0.00
Time:		13:26:30	Log	g-Likelih	ood:	1438.6
No. Observ	vations:	50	AIC	C:		-2871.
Df Residua	ıls:	47	BIG	C:		-2865.
Df Model:		2				
	coef	std err	t	\mathbf{P} > $ \mathbf{t} $	[0.025]	0.975]
Intercept	-1.243e-14	2.56e-14	-0.485	0.630	-6.4e-14	3.91e-14
Plea	0.0605	6.94 e-17	8.72e + 14	0.000	0.060	0.060
Trial	4.5182	3e-15	$1.51e{+15}$	0.000	4.518	4.518
Om	nibus:	8.336	Durbin-	Watson	2.1	56
Pro	b(Omnibus): 0.015	Jarque-	Bera (J	B): 7.5	38
Skev	w:	-0.791	$\operatorname{Prob}(\operatorname{JI}$	3):	0.02	231
Kur	tosis:	4.056	Cond. I	No.	79	0.

Notes:

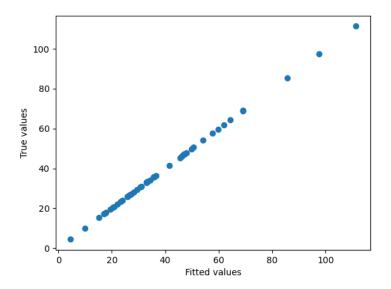


Figure 1: True vs Fitted Values, Judge Model

^[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Table 3: Judge Model

Iteration	Beta P	Beta T
0	0.06	4.52
1	0.06	4.52

2.2 County Model

Table 4: County Model

Dep. Variable:	у	R-squared:	0.998
Model:	OLS	Adj. R-squared:	0.998
Method:	Least Squares	F-statistic:	1.342e + 04
Date:	Tue, 14 Sep 2021	Prob (F-statistic):	7.67e-61
Time:	13:27:42	Log-Likelihood:	-115.16
No. Observations:	46	AIC:	236.3
Df Residuals:	43	BIC:	241.8
Df Model:	2		

	\mathbf{coef}	std err	\mathbf{t}	$\mathbf{P} \gt \mathbf{t} $	[0.025]	0.975]
Intercept	0.7176	0.599	1.199	0.237	-0.490	1.925
Plea	0.1403	0.002	67.351	0.000	0.136	0.144
Trial	3.6474	0.133	27.471	0.000	3.380	3.915
Omnibus	:	68.690	Durbin	-Watsor	ı:	2.097
Prob(Om	nibus):	0.000	Jarque	-Bera (J	B): 8	340.457
Skew:		-3.638	$\operatorname{Prob}(\operatorname{J}$	B):	3.	14e-183
Kurtosis:		22.636	Cond.	No.		679.

Notes:

^[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

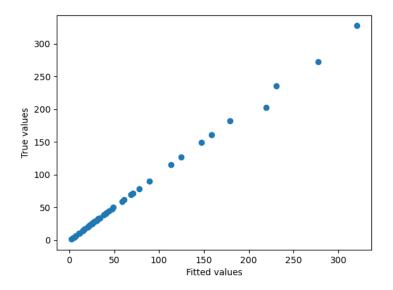


Figure 2: True vs Fitted Values, Judge-County Model

Table 5: Judge Model

Iteration	Beta P	Beta T
0	0.15	3.61
1	0.14	3.67
2	0.14	3.65

2.3 Judge-County Model

Table 6: County Model

Dep. Variable:		У		R-square	d:	0.97	7
Model:		OLS		Adj. R-s	quared:	0.97	7
Method:]	Least Squa	res	F-statisti	ic:	5950).
Date:	Τι	ie, 14 Sep	2021	Prob (F-	statistic)): 4.56e-	227
Time:		13:28:16	;	Log-Like	lihood:	-492.	29
No. Observation	ons:	278		AIC:		990	6
Df Residuals:		275		BIC:		100	1.
Df Model:		2					
	coef	std err	t	P> t	[0.025]	0.975]	
Intercept	0.4624	0.110	4.000	0.000	0.040		
	0.4634	0.110	4.203	0.000	0.246	0.681	
Plea	0.4054 0.0665	$0.110 \\ 0.001$	4.203 50.392		0.246 0.064	0.681 0.069	
-				0.000	00		
Plea	0.0665	0.001	50.392 68.783	0.000	0.064 3.971	0.069	
Plea Trial	0.0665 4.0877	$0.001 \\ 0.059$	50.392 68.783 Durbi	0.000	0.064 3.971	0.069 4.205	
Plea Trial Omnibus:	0.0665 4.0877	0.001 0.059 462.896	50.392 68.783 Durbi	0.000 0.000 n-Watson e-Bera (J	0.064 3.971	0.069 4.205 2.072	

Notes:

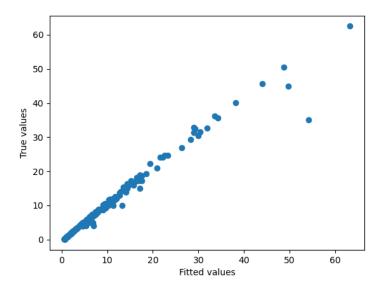


Figure 3: True vs Fitted Values, Judge-County Model

^[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Table 7: Judge-County Model

Iteration	Beta P	Beta T
0	0.10	4.19
1	0.08	4.11
2	0.07	4.09

3 Judge-level Busyness Analysis

The goal of this exercise was to get a better idea of which are the busiest judges. I focused only on GS days. So when I say the number of pleas and number of trials, I mean those that happened on GS days. We have at least three measures of business: the number of pleas, the number of trials, and the number of GS days assigned to a county. I ranked the judges according to a measure that combined the three measures. To create this measure, I ranked all of the judges according to each measure. I then multiplied each county's score in each measure to create an overall measure. So, for example, if Judge 1 had the most pleas, then its ranking according to pleas would be 1. If Judge 1 had the second most trials, then its ranking according to trials would be 2. If it had the sixth most GS days, then its ranking according to GS days would be 6. Judge 1's overall measure would be $1 \cdot 2 \cdot 6 = 12$. This ranking can be seen in table 8. I also created bar charts of the number of pleas, trials, GS days, and the utilization for each county. I calculate the utilization by using the service rate estimates from the county model to calculate the expected number of days it took to process each county's pleas and trials. I then divide the expected number of days by the actual number of assigned days to get the utilization.

In table 8, the columns PleaShare, TrialShare, and GSShare contain the cumulative share of all pleas, trials, and GS days accounted for by the counties up to that row. So, for example, in the 10th row, if the value of PleaShare is 0.5, that means that the top 10 counties account for 50% of all pleas. Similarly, if in the 15th row the value of Trial share is 0.9, that means that the top 15 counties account for 90% of all trials. GS share refers to the share of all GS days assigned. The counties in table 8 are ranked using the measure described in the beginning of the section.

Table 8: CDF table

1	ria	JudgeID	Trial	Days	OverallScore	PleaShare	TrialShare	GSDayShare
3 Judge 50 469 9 129.50 144 0.09 0.19 4 Judge 16 1041 5 90.00 320 0.16 0.21 5 Judge 18 202 11 123.00 576 0.19 0.29 7 Judge 2 390 9 121.00 672 0.22 0.33 8 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 26 450 5 103.00 2052 0.35 0.49 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1	1	1 Judge 7	17	167.00	4	0.04	0.08	0.04
4 Judge 16 1041 5 90.00 320 0.16 0.21 5 Judge 49 321 6 137.00 440 0.18 0.24 6 Judge 18 202 11 123.00 576 0.19 0.29 7 Judge 2 390 9 121.00 672 0.22 0.33 8 Judge 61 505 6 89.00 1056 0.23 0.38 9 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 26 450 5 103.00 2052 0.35 0.49 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 34 472.00 30	1	2 Judge 24	17	110.50	133	0.06	0.15	0.07
5 Judge 49 321 6 137.00 440 0.18 0.24 6 Judge 18 202 11 123.00 576 0.19 0.29 7 Judge 2 390 9 121.00 672 0.22 0.33 8 Judge 11 244 12 107.00 810 0.23 0.38 9 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 3 4 76.00 <td< td=""><td>9</td><td>3 Judge 50</td><td>9</td><td>129.50</td><td>144</td><td>0.09</td><td>0.19</td><td>0.10</td></td<>	9	3 Judge 50	9	129.50	144	0.09	0.19	0.10
6 Judge 18 202 11 123.00 576 0.19 0.29 7 Judge 2 390 9 121.00 672 0.22 0.33 8 Judge 11 244 12 107.00 810 0.23 0.38 9 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 26 450 5 103.00 2052 0.35 0.49 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 23 228 7 <t< td=""><td></td><td>4 Judge 16</td><td>5</td><td>90.00</td><td>320</td><td>0.16</td><td>0.21</td><td>0.12</td></t<>		4 Judge 16	5	90.00	320	0.16	0.21	0.12
7 Judge 2 390 9 121.00 672 0.22 0.33 8 Judge 1 244 12 107.00 810 0.23 0.38 9 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 9 398 2 1	(5 Judge 49	6	137.00	440	0.18	0.24	0.15
8 Judge 11 244 12 107.00 810 0.23 0.38 9 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 22 480 4 98.50 1848 0.32 0.47 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3366 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 9 398 2 105.50 4800 0.54 0.65 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 44 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 8 313 5 72.00 18870 0.68 0.77 28 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 47 288 3 73.00 24025 0.80 32 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 38 247 4 64.00 27550 0.82 0.85 33 Judge 39 228 3 3 44.00 31772 0.84 0.87 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 40 112 5 40.00 32256 0.84 0.89 38 Judge 32 226 3 64.00 34366 0.88 0.91 39 Judge 43 283 0 72.00 4268 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 22 1170 3 70.00 46200 0.92 0.93	1	6 Judge 18	11	123.00	576	0.19	0.29	0.18
9 Judge 6 505 6 89.00 1056 0.27 0.41 10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 22 480 4 98.50 1848 0.32 0.47 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 9 398 2 105.50 4800 0.54 0.65 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 4 395 2 78.00 11934 0.65 0.75 26 Judge 8 353 1 97.00 13464 0.67 0.75 27 Judge 8 215 5 72.00 18870 0.68 0.77 28 Judge 4 317 2 80.00 2020 0.72 0.80 30 Judge 44 43 35 1 75.00 22950 0.77 28 Judge 44 37 1 75.00 22950 0.77 29 Judge 48 317 2 80.00 2020 0.72 0.80 30 Judge 44 43 35 1 75.00 22950 0.77 31 Judge 34 355 1 75.00 22950 0.77 32 Judge 44 37 38 3 73.00 24025 0.80 0.84 34 Judge 34 355 1 75.00 22950 0.77 35 Judge 45 161 3 90.00 23814 0.78 0.82 35 Judge 45 161 3 90.00 23814 0.78 0.82 36 Judge 45 161 3 90.00 23814 0.78 0.82 37 Judge 32 226 3 64.00 32256 0.84 0.89 38 Judge 32 226 3 64.00 32256 0.84 0.89 39 Judge 43 283 0 72.00 44800 0.91 0.92 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 21 170 3 70.00 46200 0.92 0.93	9	7 Judge 2	9	121.00	672	0.22	0.33	0.21
10 Judge 10 315 9 108.50 1232 0.29 0.45 11 Judge 22 480 4 98.50 1848 0.32 0.47 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 5 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 105.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6	1	8 Judge 11	12	107.00	810	0.23	0.38	0.24
11 Judge 22 480 4 98.50 1848 0.32 0.47 12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 5 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404	(9 Judge 6	6	89.00	1056	0.27	0.41	0.26
12 Judge 26 450 5 103.00 2052 0.35 0.49 13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 25 527 1 87.00 2898 0.43 0.53 15 Judge 5 492 4 76.00 3360 0.47 0.55 16 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 9 389 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2	,	10 Judge 10	9	108.50	1232	0.29	0.45	0.28
13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 9 398 2 105.50 4800 0.54 0.65 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 19 293 4		11 Judge 22	4	98.50	1848	0.32	0.47	0.31
13 Judge 1 293 4 122.00 2300 0.37 0.51 14 Judge 33 479 4 98.00 2352 0.40 0.52 15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 9 398 2 105.50 4800 0.54 0.65 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 19 293 4		12 Judge 26	5	103.00	2052	0.35	0.49	0.33
15 Judge 25 527 1 87.00 2898 0.43 0.53 16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353			4	122.00	2300	0.37	0.51	0.36
16 Judge 5 492 4 76.00 3360 0.47 0.55 17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 9 398 2 105.50 4800 0.54 0.65 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193		14 Judge 33	4	98.00	2352	0.40	0.52	0.39
17 Judge 13 228 7 105.50 3410 0.48 0.58 18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 48 317		15 Judge 25	1	87.00	2898	0.43	0.53	0.41
18 Judge 47 388 5 100.00 3536 0.51 0.60 19 Judge 9 398 2 105.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 26 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 30 Judge 44 443		16 Judge 5	4	76.00	3360	0.47	0.55	0.42
19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 48 317 2 80.00 20022 0.72 0.80 30 Judge 44 443 0 48.67 22050 0.75 0.81 31 Judge 34 355		17 Judge 13	7	105.50	3410	0.48	0.58	0.45
19 Judge 30 147 10 96.50 3870 0.52 0.64 20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 48 317 2 80.00 2002 0.72 0.80 30 Judge 48 317 2 80.00 2002 0.75 0.80 31 Judge 44 435		_	5	100.00	3536	0.51	0.60	0.47
20 Judge 9 398 2 105.50 4800 0.54 0.65 21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.81 31 Judge 34 355	1	_	10	96.50	3870	0.52	0.64	0.50
21 Judge 39 389 6 76.00 5655 0.57 0.68 22 Judge 19 404 2 92.00 7524 0.59 0.69 23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161		_	2	105.50	4800	0.54	0.65	0.52
23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247	(_	6	76.00	5655	0.57	0.68	0.54
23 Judge 29 293 4 98.50 8280 0.61 0.71 24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247		0						0.56
24 Judge 4 162 7 85.50 8856 0.62 0.74 25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 40 112		_	4	98.50	8280	0.61	0.71	0.59
25 Judge 44 395 2 78.00 11934 0.65 0.75 26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.89 37 Judge 40 112 <td></td> <td>_</td> <td>7</td> <td>85.50</td> <td>8856</td> <td>0.62</td> <td>0.74</td> <td>0.61</td>		_	7	85.50	8856	0.62	0.74	0.61
26 Judge 28 353 1 97.00 13464 0.67 0.75 27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 32 226 <td></td> <td>_</td> <td>2</td> <td>78.00</td> <td>11934</td> <td>0.65</td> <td>0.75</td> <td>0.63</td>		_	2	78.00	11934	0.65	0.75	0.63
27 Judge 3 193 5 72.00 18870 0.68 0.77 28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 23 283 <td></td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.65</td>		9						0.65
28 Judge 8 215 5 72.00 19008 0.70 0.80 29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 40 Judge 27 204 </td <td></td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.67</td>		9						0.67
29 Judge 48 317 2 80.00 20202 0.72 0.80 30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204<		0						0.68
30 Judge 46 443 0 48.67 22050 0.75 0.80 31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.92 0.93 42 Judge 23 139<		9						0.70
31 Judge 34 355 1 75.00 22950 0.77 0.81 32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 23 139 3 64.00 53820 0.93 0.95		9						0.71
32 Judge 45 161 3 90.00 23814 0.78 0.82 33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 23 139 3 64.00 53820 0.93 0.95		0						0.73
33 Judge 17 288 3 73.00 24025 0.80 0.84 34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95			3	90.00	23814	0.78	0.82	0.75
34 Judge 38 247 4 64.00 27550 0.82 0.85 35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95								0.77
35 Judge 42 283 3 44.00 31772 0.84 0.87 36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95		_						0.79
36 Judge 40 112 5 40.00 32256 0.84 0.89 37 Judge 12 268 1 82.00 32900 0.86 0.89 38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95		9						0.80
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38 Judge 32 226 3 64.00 34336 0.88 0.91 39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95		_						0.83
39 Judge 43 283 0 72.00 42768 0.89 0.91 40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95								0.84
40 Judge 27 204 3 60.00 44800 0.91 0.92 41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95								0.86
41 Judge 21 170 3 70.00 46200 0.92 0.93 42 Judge 23 139 3 64.00 53820 0.93 0.95		_						0.87
42 Judge 23 139 3 64.00 53820 0.93 0.95		_						0.89
		_						0.91
		_						0.92
44 Judge 37 112 3 46.50 60536 0.95 0.96								0.93
45 Judge 31 171 2 58.00 62361 0.96 0.97		_						0.95
46 Judge 35 176 1 54.00 65436 0.97 0.98		_						0.96
47 Judge 15 144 2 52.00 66220 0.98 0.99		_						0.97
48 Judge 36 139 2 49.00 75240 0.99 1.00		_						0.99
49 Judge 41 91 1 38.00 103243 1.00 1.00		_						0.99
50 Judge 20 72 0 23.00 125000 1.00 1.00		_						1.00

3.1 Overall Figures

In figure 4, the counties are ordered according to the overall ranking described in the previous section.

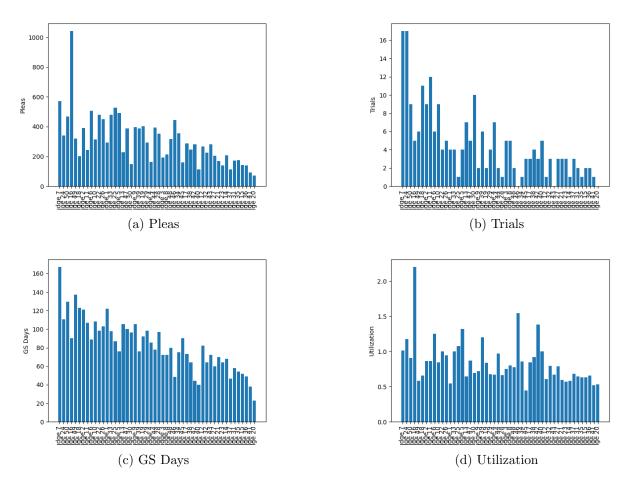


Figure 4: Number of Pleas, Trials, GS days, and utilization for each county.

3.2 Comparing Busy and Idle Judges

The purpose of this section is to further investigate how 'busy' counties are different from 'idle' counties. To do this, I split the counties into above median and below median in terms of business. Here, business is measured according to the measure described in the beginning of the section.

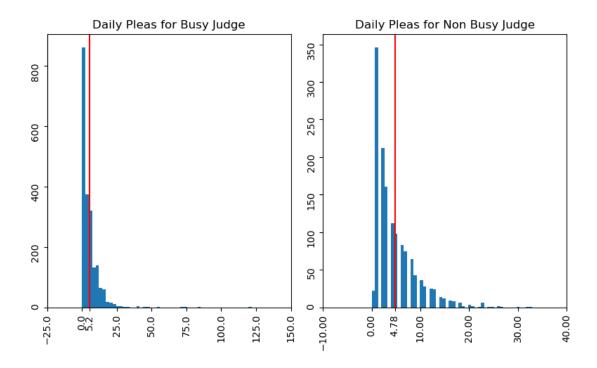


Figure 5: Histogram of pleas processed per day

4 Model with County Fixed Effects

Note, the unit of observation here, i, is the judge-county combination. The regression we are running here is: $\text{Days}_i = \alpha_c + \beta_p \text{Plea}_i + \beta_t \text{Trial}_i + \epsilon_i$

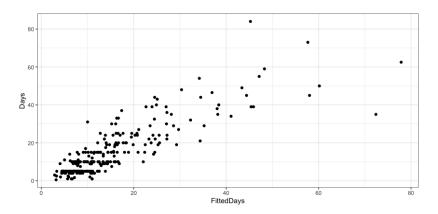


Figure 6: True vs Fitted Values, fixed effects model

Table 9: Model with County Fixed effects, table continues on next page

-	De	ependent variable.
		Days
Plea		0.091***
		(0.008)
Trial		4.336***
		(0.339)
CountyAbbeville		6.411^{*}
v		(3.784)
CountyAiken		3.107
County minon		(2.909)
CountyAllendale		(2.909) 4.425
Jounny Americale		
7 A		(4.360)
CountyAnderson		5.237*
		(2.985)
CountyBamberg		5.443
		(4.364)
CountyBarnwell		2.608
v		(3.782)
CountyBeaufort		8.232***
Julio Doudioi 0		(2.524)
County Borleslo-		$\frac{(2.524)}{3.724}$
CountyBerkeley		
		(2.885)
CountyCalhoun		3.852
		(4.361)
CountyCharleston		9.165***
*		(2.237)
CountyCherokee		3.112
		(3.408)
CountyChester		14.170***
ounty Onester		
7101 / 0.11		(4.365)
CountyChesterfield		4.966
		(3.093)
CountyClarendon		7.305**
		(3.387)
CountyColleton		4.991^{*}
v		(2.858)
CountyDarlington		7.293**
		(3.091)
CountyDillon		7.260**
CountyDillon		
7		(3.380)
CountyDorchester		2.073
		(3.876)
CountyEdgefield		7.832*
		(4.371)
CountyFairfield		5.677
		(3.798)
CountyFlorence		9.426***
Country 1 TOLEHOE		
7		(3.229)
CountyGeorgetown		5.565
		(3.415)
CountyGreenville		6.571**
		(2.687)
CountyGreenwood	10	5.803*
V	10	(3.122)
CountyHampton		4.003
Jountymanipton		
		(3.777)

Table 10: Model with County Fixed effects, continued

	Dependent variable:
	Days
CountyHorry	5.715**
	(2.482)
CountyJasper	$\stackrel{\cdot}{3.514}^{\prime}$
v I	(3.779)
CountyKershaw	6.248**
County Horsian	(2.871)
CountyLancaster	11.090***
Country Lancaster	(3.788)
CountyLaurens	7.800**
CountyLaurens	
C I	(3.106)
CountyLee	4.218
	(3.382)
CountyLexington	4.390**
	(2.219)
CountyMarion	5.295
	(3.790)
CountyMarlboro	10.937***
•	(3.792)
CountyMcCormick	$6.248^{'}$
-,	(4.362)
CountyNewberry	6.035^*
Coarry 1.0 W DOLLY	(3.385)
CountyOconee	(3.363) 2.834
County Oconee	
Country 0 1	(3.097)
CountyOrangeburg	6.506**
C + D: 1	(2.689)
CountyPickens	6.166**
	(3.101)
CountyRichland	10.717***
	(2.141)
CountySaluda	4.655
	(4.365)
CountySpartanburg	2.984
· - 9	(2.897)
CountySumter	6.194**
·	(2.883)
CountyUnion	6.537^*
Coarry Chion	(3.388)
CountyWilliamsburg	(3.300 <i>)</i> 5.859**
County w mainspurg	
O 137 1	(2.675)
CountyYork	7.085***
	(2.651)
Observations	278
$ m R^2$	0.881
$Adjusted R^2$	0.856
Residual Std. Error	7.552 (df = 230)
F Statistic	$35.355^{***} (df = 230)$
r Statistic	55.555 (df = 46; 230)
Note:	*p<0.1; **p<0.05; ***p<0

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5 Non-linear Approach

I looked into using a log-linear model, however, none of the approaches I found would yield simple to interpret service rates. I think we might be trading off more interpretable fixed effects for more interpretable service rate estimates. For example, we could estimate a Poisson regression with the specification $\operatorname{Days}_i \sim P(\mu_i)$ and $\mu_i = \exp(\beta_p \operatorname{Plea}_i + \beta_t \operatorname{Trial}_i + \alpha_j)$. This would yield nice interpretations for the α_j 's. The judge fixed effects would have a multiplicative effect on the days, and we could interpret this as sort of proportional idleness. However, we would lose the simplicity of the model $\operatorname{Days}_i = \beta_p \operatorname{Trials}_i + \beta_p \operatorname{Pleas}_i + \epsilon_i$. Since we are ultimately most interested in β_p and β_t , I don't think this tradeoff is worth it.