P6 Penultimate Analyses

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Table 1: Unweighted Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Ex-Felon Percentage	1,550	3.761	1.757	0.440	2.450	3.425	4.700	12.340
Not Employed Rate	1,550	23.263	4.632	12.986	20.135	22.967	26.149	43.963
Unemployment Rate	1,550	6.063	2.244	2.206	4.529	5.577	7.187	19.048
Idleness Rate	1,550	17.378	3.351	9.973	15.012	17.173	19.351	29.125
Can't Find Work Rate	850	17.773	3.440	10.299	15.393	17.597	19.942	28.769
Population Share 16-25	1,550	19.483	2.708	13.331	17.547	18.882	20.899	30.243
Population Share 26-35	1,550	19.973	3.072	12.553	17.418	20.136	22.191	32.668
Population Share 36-45	1,550	18.805	2.444	12.446	17.068	18.934	20.554	29.022
Population Share 46-55	1,550	15.359	2.712	10.274	12.913	14.907	17.822	23.034
Population Share 56-65	1,550	11.912	1.639	6.368	10.808	11.777	12.914	17.791
Population Share 66+	1,550	14.467	2.256	3.526	13.277	14.646	15.751	20.604
Ovr. Unemployment Rate t	1,550	6.035	2.138	2.219	4.548	5.606	7.148	17.831
Ovr. Unemployment Rate t-1	1,500	5.940	2.075	2.219	4.480	5.540	6.970	17.831
Ovr. Unemployment Rate t-2	1,450	5.849	2.019	2.219	4.442	5.492	6.828	17.831
Ovr. Unemployment Rate t-3	1,400	5.866	2.040	2.219	4.441	5.495	6.860	17.831
Disability Rate	1,150	0.519	0.135	0.214	0.425	0.500	0.596	1.079
SSI Rate	1,550	21.445	9.921	3.817	14.181	18.966	26.520	59.248
Marriage Rate	1,550	59.207	5.445	44.599	55.085	58.601	63.221	75.752
Effective Wage	1,550	4.711	1.293	3.100	3.350	4.270	5.150	8.550
Mean TANF Maximum	1,550	382.618	151.914	92.000	281.667	356.500	473.333	925.333
Unemployment Compensation	1,550	350.348	67.075	157.124	302.552	348.668	394.420	581.813

Scatterplot of First Differences – Not Employed Rate
OLS Fit
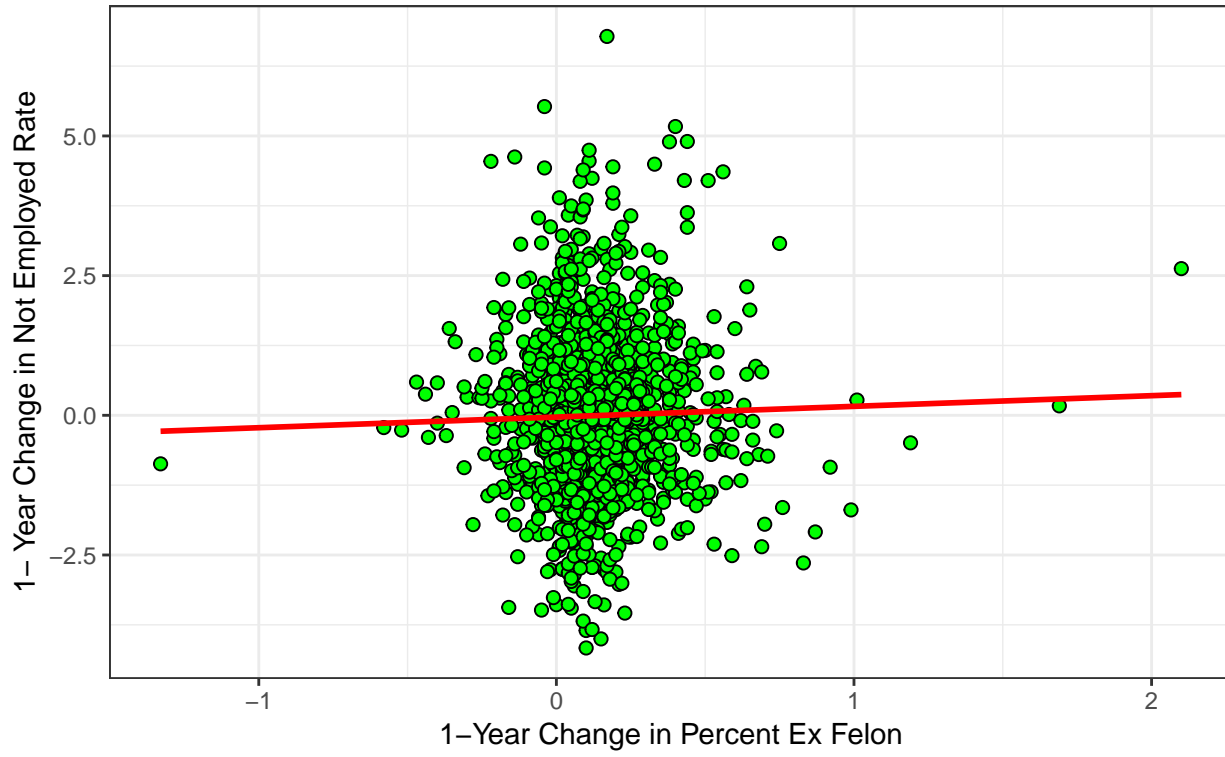
p6 Overall Models

Table 2: Fixed Effects Regression

	(1)	(2)	(3)	(4)	(5)
Ex-Felon Percentage	0.476*** (0.124)	0.306 (0.254)	0.263 (0.206)	0.309** (0.101)	0.307*** (0.091)
Population Share 26-35		0.145 (0.164)	0.079 (0.165)	0.031 (0.051)	0.058 (0.050)
Pop. Share 36-45		0.308 (0.215)	0.266 (0.220)	−0.045 (0.055)	−0.007 (0.047)
Pop. Share 46-55		0.106 (0.170)	0.012 (0.174)	−0.250*** (0.072)	−0.190** (0.064)
Pop. Share 56-65		−0.058 (0.237)	−0.039 (0.207)	−0.011 (0.060)	0.084 (0.055)
Pop. Share 66+		0.209 (0.153)	0.222 (0.148)	0.003 (0.059)	0.045 (0.053)
SSI Rate			−0.053 (0.079)	−0.068* (0.028)	−0.034 (0.027)
Marriage Rate			0.074 (0.088)	0.018 (0.028)	0.004 (0.025)
Effective Wage			0.658* (0.308)	0.178 (0.128)	0.092 (0.119)
Mean TANF Maximum			−0.002 (0.004)	0.001 (0.001)	0.000 (0.001)
Unemployment Comp.			0.009* (0.004)	0.000 (0.002)	−0.001 (0.001)
Ovr. Unemp. Rate t-1				0.926*** (0.056)	0.074* (0.029)
Ovr. Unemp. Rate t-2				−0.075 (0.040)	−0.006 (0.028)
Ovr. Unemp. Rate t-3				0.090 (0.048)	0.212*** (0.042)
Ovr. Unemp. Rate t					0.906*** (0.047)
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	1,550	1,550	1,550	1,400	1,400
R^2	0.036	0.032	0.062	0.427	0.588
Adjusted R^2	−0.016	−0.024	0.004	0.388	0.559

Notes: ***Significant at the 0.1 percent level.
**Significant at the 1 percent level.
*Significant at the 5 percent level.
Clustered Standard Errors by State and Year.
Weighted by State-Year total pop.

Table 3: Models of Alternative Employment Measures

	Idleness	Unemployment	Can't Find Work
	(1)	(2)	(3)
Ex-Felon Percentage	0.238** (0.085)	0.028 (0.041)	0.220 (0.125)
Population Share 26-35	0.120* (0.051)	−0.012 (0.021)	0.078 (0.064)
Pop. Share 36-45	−0.011 (0.051)	−0.026 (0.024)	0.102 (0.056)
Pop. Share 46-55	−0.221*** (0.066)	−0.063* (0.029)	−0.025 (0.072)
Pop. Share 56-65	0.037 (0.054)	−0.099*** (0.023)	0.095 (0.070)
Pop. Share 66+	0.043 (0.053)	−0.028 (0.022)	0.125 (0.067)
SSI Rate	−0.001 (0.027)	−0.046*** (0.010)	−0.033 (0.036)
Marriage Rate	0.035 (0.027)	0.003 (0.012)	−0.052 (0.034)
Effective Wage	0.105 (0.112)	0.110* (0.049)	0.064 (0.101)
Mean TANF Maximum	0.001 (0.001)	0.001 (0.000)	0.000 (0.002)
Unemployment Comp.	−0.001 (0.002)	0.001 (0.001)	0.002 (0.002)
Ovr. Unemp. Rate t-1	0.104*** (0.028)	0.964*** (0.037)	0.203*** (0.052)
Ovr. Unemp. Rate t-2	−0.005 (0.030)	−0.108** (0.034)	0.049 (0.049)
Ovr. Unemp. Rate t-3	0.214*** (0.043)	−0.120*** (0.023)	0.133*** (0.040)
Ovr. Unemp. Rate t	0.136** (0.052)		0.009 (0.060)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,400	1,400	850
R^2	0.155	0.642	0.067
Adjusted R^2	0.096	0.618	−0.030

Notes: ***Significant at the 0.1 percent level.
    **Significant at the 1 percent level.
    *Significant at the 5 percent level.
    Clustered Standard Errors by State and Year
    Weighted by State-Year total pop.

Table 4: Alternative Sample Models

|	P6 Male	P6 Female	P6 Black	P6 White	WA All
	(1)	(2)	(3)	(4)	(5)
Ex-Felon Percentage	0.105 (0.084)	0.522*** (0.140)	0.307 (0.166)	0.399*** (0.104)	0.244* (0.100)
Population Share 26-35	0.155*** (0.039)	0.017 (0.073)	0.425*** (0.106)	0.060 (0.053)	0.116* (0.047)
Pop. Share 36-45	0.245*** (0.047)	−0.190** (0.072)	0.223* (0.099)	0.009 (0.049)	0.048 (0.044)
Pop. Share 46-55	0.071 (0.041)	−0.436*** (0.109)	−0.186 (0.157)	−0.202** (0.073)	−0.179** (0.059)
Pop. Share 56-65	0.118** (0.040)	0.029 (0.091)	0.454*** (0.129)	0.084 (0.064)	0.398*** (0.058)
Pop. Share 66+	0.242*** (0.042)	−0.110 (0.084)	0.127 (0.112)	0.065 (0.057)	0.146** (0.051)
SSI Rate	0.027 (0.031)	−0.085* (0.035)	0.059 (0.050)	−0.069* (0.031)	−0.035 (0.030)
Marriage Rate	−0.171*** (0.022)	0.121** (0.037)	−0.217*** (0.008)	0.013 (0.026)	0.006 (0.028)
Effective Wage	0.174* (0.086)	0.046 (0.207)	−0.328 (0.289)	0.168 (0.125)	0.125 (0.111)
Mean TANF Maximum	0.000 (0.001)	0.001 (0.002)	0.003 (0.003)	−0.000 (0.002)	0.000 (0.001)
Unemployment Comp.	−0.001 (0.001)	−0.001 (0.002)	−0.007* (0.003)	−0.001 (0.002)	−0.000 (0.001)
Ovr. Unemp. Rate t-1	0.070* (0.028)	0.080 (0.043)	0.068 (0.111)	0.100** (0.032)	0.083** (0.026)
Ovr. Unemp. Rate t-2	−0.022 (0.027)	0.025 (0.044)	0.045 (0.114)	−0.037 (0.032)	0.004 (0.028)
Ovr. Unemp. Rate t-3	0.060* (0.030)	0.355*** (0.071)	0.603*** (0.095)	0.125* (0.049)	0.218*** (0.038)
Ovr. Unemp. Rate t	1.103*** (0.050)	0.728*** (0.069)	1.147*** (0.114)	0.861*** (0.053)	0.812*** (0.049)
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	1,400	1,400	1,389	1,400	1,400
R^2	0.614	0.377	0.033	0.524	0.566
Adjusted R^2	0.588	0.334	−0.035	0.491	0.535

Notes: ***Significant at the 0.1 percent level.
**Significant at the 1 percent level.
*Significant at the 5 percent level.
Clustered Standard Errors by State and Year.
Weighted by State-Year total pop.

Rolling-Window Models and Plot

Ex–Felon Density FE Coefficient Over Time – Rolling Window Estimates
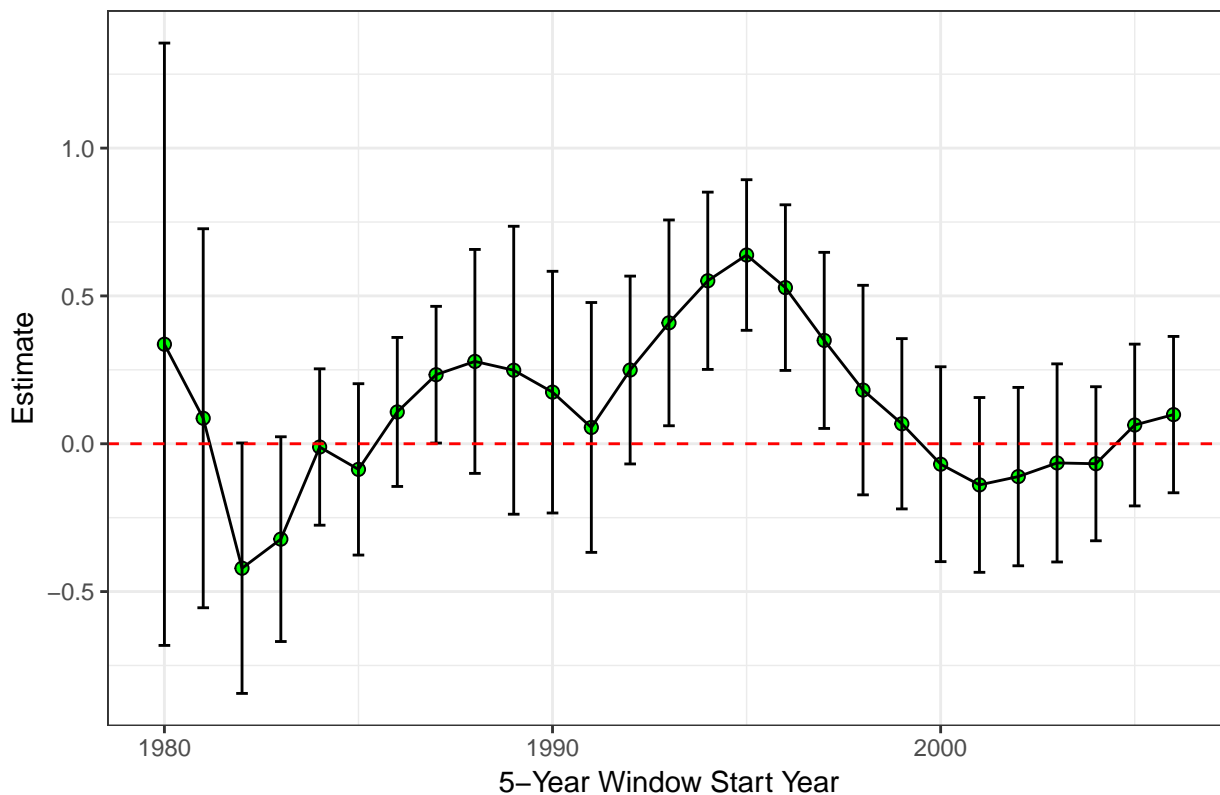
Estimates with Diability Measures (SSDI & ASEC Disability Rate)

```
y1.fe.d <- plm(p6.y1.notemployed.rate~pctexfel+popshare.26.35+popshare.36.45+popshare.46.55+popshare.
               ssi.rate+p6.marriage.rate+effective.wage+TANF.mu+z_labor_unemployment_compensatio
               t_1.unemp.rate+t_2.unemp.rate+t_3.unemp.rate+t.unemp.rate,
               data = fe.ov, weights = norm.weight, index = c("STATENAME","YEAR"), model="within",
y1.fe.robust.d <- coeftest(y1.fe.d, vcov=vcovHC(y1.fe.d,type="HC0",cluster=c("group","time")))

y2.fe.d <- plm(p6.y1.notemployed.rate~pctexfel+popshare.26.35+popshare.36.45+popshare.46.55+popshare.
               ssi.rate+p6.marriage.rate+effective.wage+TANF.mu+z_labor_unemployment_compensatio
               t_1.unemp.rate+t_2.unemp.rate+t_3.unemp.rate+ssdi.rate,
               data = fe.ov, weights = norm.weight, index = c("STATENAME","YEAR"), model="within",
y2.fe.robust.d <- coeftest(y2.fe.d, vcov=vcovHC(y2.fe.d,type="HC0",cluster=c("group","time")))

y3.fe.d <- plm(p6.y1.notemployed.rate~pctexfel+popshare.26.35+popshare.36.45+popshare.46.55+popshare.
               ssi.rate+p6.marriage.rate+effective.wage+TANF.mu+z_labor_unemployment_compensatio
               t_1.unemp.rate+t_2.unemp.rate+t_3.unemp.rate+p6.disab.rate,
               data = fe.ov, weights = norm.weight, index = c("STATENAME","YEAR"), model="within",
y3.fe.robust.d <- coeftest(y3.fe.d, vcov=vcovHC(y3.fe.d,type="HC0",cluster=c("group","time")))

y4.fe.d <- plm(p6.y1.notemployed.rate~pctexfel+popshare.26.35+popshare.36.45+popshare.46.55+popshare.
               ssi.rate+p6.marriage.rate+effective.wage+TANF.mu+z_labor_unemployment_compensatio
               t_1.unemp.rate+t_2.unemp.rate+t_3.unemp.rate+ssdi.rate+p6.disab.rate,
               data = fe.ov, weights = norm.weight, index = c("STATENAME","YEAR"), model="within",
```

```r
y4.fe.robust.d <- coeftest(y4.fe.d, vcov=vcovHC(y4.fe.d,type="HC0",cluster=c("group","time")))


d.fe.robust.se <- list(y1.fe.robust.d[,2], y2.fe.robust.d[,2], y3.fe.robust.d[,2], y4.fe.robust.d[,2]
d.fe.robust.p <- list(y1.fe.robust.d[,4], y2.fe.robust.d[,4], y3.fe.robust.d[,4], y4.fe.robust.d[,4])
```

Table 5: Models Including SSDI and ASEC Disability Rate

	p6.y1.notemployed.rate			
	(1)	(2)	(3)	(4)
Ex-Felon Percentage	0.307*** (0.091)	0.027 (0.179)	0.327** (0.116)	−0.020 (0.178)
Population Share 26-35	0.058 (0.050)	−0.107 (0.085)	−0.056 (0.056)	−0.155 (0.085)
Pop. Share 36-45	−0.007 (0.047)	0.112 (0.100)	−0.032 (0.054)	0.065 (0.098)
Pop. Share 46-55	−0.190** (0.064)	−0.091 (0.099)	−0.206*** (0.062)	−0.152 (0.102)
Pop. Share 56-65	0.084 (0.055)	−0.108 (0.104)	0.055 (0.054)	−0.113 (0.103)
Pop. Share 66+	0.045 (0.053)	0.031 (0.106)	−0.061 (0.055)	0.010 (0.105)
SSI Rate	−0.034 (0.027)	−0.007 (0.067)	−0.097*** (0.026)	−0.013 (0.059)
Marriage Rate	0.004 (0.025)	−0.080* (0.037)	0.011 (0.028)	−0.055 (0.036)
Effective Wage	0.092 (0.119)	0.195 (0.136)	−0.002 (0.135)	0.179 (0.136)
Mean TANF Maximum	0.000 (0.001)	−0.000 (0.002)	−0.000 (0.002)	−0.000 (0.002)
Unemployment Comp.	−0.001 (0.001)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)
Ovr. Unemp. Rate t-1	0.074* (0.029)	0.862*** (0.082)	0.871*** (0.062)	0.860*** (0.081)
Ovr. Unemp. Rate t-2	−0.006 (0.028)	−0.128 (0.073)	−0.076 (0.050)	−0.155* (0.071)
Ovr. Unemp. Rate t-3	0.212*** (0.042)	0.023 (0.095)	0.072 (0.043)	0.043 (0.095)
Ovr. Unemp. Rate t	0.906*** (0.047)			
SSDI		0.477 (0.355)		0.230 (0.307)
ASEC Disab.			2.447*** (0.367)	3.193*** (0.525)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1,400	500	1,150	500
R^2	0.588	0.258	0.403	0.293
Adjusted R^2	0.559	0.131	0.355	0.170

Notes: ***Significant at the 0.1 percent level.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
Clustered Standard Errors by State and Year.
Weighted by State-Year total pop.

Felon Density Maps

```r
#Read in the geojson of state boundaries
#You could also use the tidycensus package: https://walkerke.github.io/tidycensus/

census_api_key("ecda17575f4d914b502c70f2bae7a5f3d253792d")

## To install your API key for use in future sessions, run this function with `install = TRUE`.
#vars <- load_variables(year = 2010, dataset = "sf1")

states <- get_decennial(geography = "state", variables = "P001001", #output = "wide",
                    geometry = T, shift_geo = T) %>% mutate(id=tolower(NAME))
```

```
## Getting data from the 2010 decennial Census

## Using feature geometry obtained from the albersusa package

## Please note: Alaska and Hawaii are being shifted and are not to scale.
fd <- fe %>% group_by(STATENAME) %>% summarize(density = mean(pctexfel)) %>% rename(id = STATENAME) %
fd.t <- fe %>% group_by(YEAR, STATENAME) %>% summarize(density = mean(pctexfel)) %>% rename(id = STAT

fd.1980 <- fd.t %>% filter(YEAR==1980)
fd.2010 <- fd.t %>% filter(YEAR==2010)

usa <- states %>% inner_join(fd, by = "id")
usa.1980 <- states %>% inner_join(fd.1980, by = "id")
usa.2010 <- states %>% inner_join(fd.2010, by = "id")

#average across years
ggplot(usa) +
  geom_sf(aes(geometry = geometry, fill=density)) + #geom_sf works with sf data frames
  coord_sf(crs=2163)+ #Specify crs of the projection. This is Albers equal area.
  scale_fill_distiller(palette = "Spectral",
                       breaks = c(seq(1,8,1)),
                       limits = c(1,8),
                     name = "Percent") +
  ggtitle("Ex-Felon Density in the United States: 1980-2010",
          subtitle = "Shannon et al. 2017")+
  theme(axis.text = element_blank(),
  axis.line = element_blank(),
  axis.ticks = element_blank(),
  panel.border = element_blank(),
  panel.grid = element_blank(),
  axis.title = element_blank(),
  panel.background = element_blank(),
  panel.grid.major = element_line(colour="transparent"), #Removes graticule lines
  plot.subtitle = element_text(face="italic"))
```

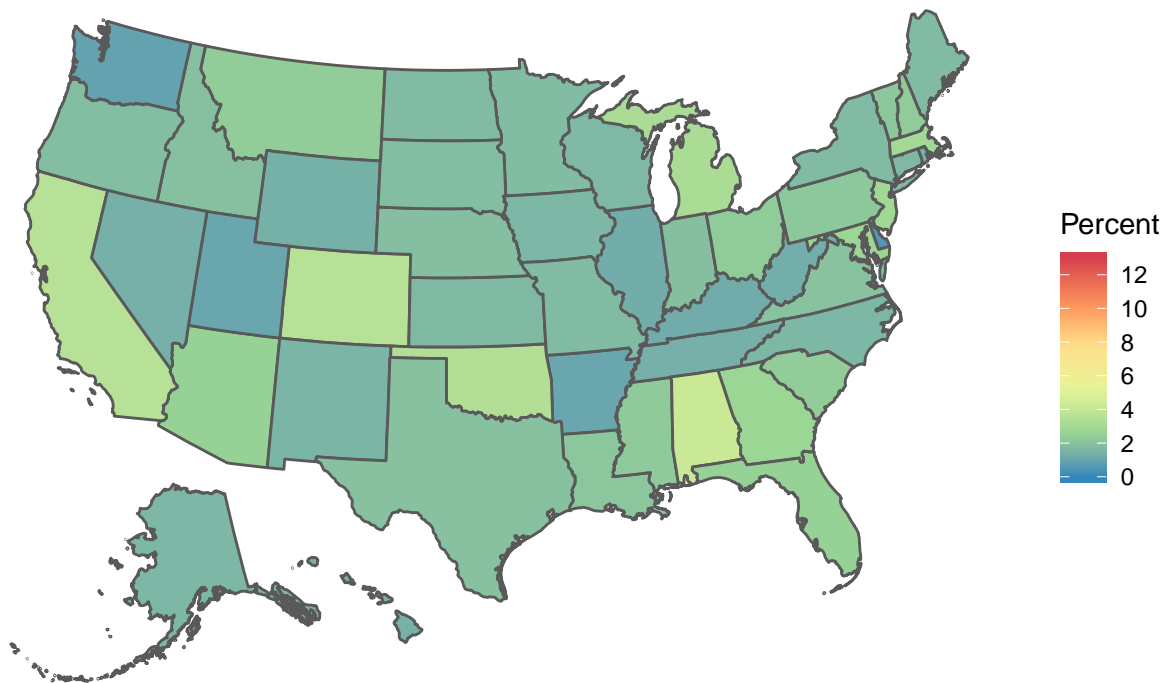# Ex–Felon Density in the United States: 1980–2010

Shannon et al. 2017
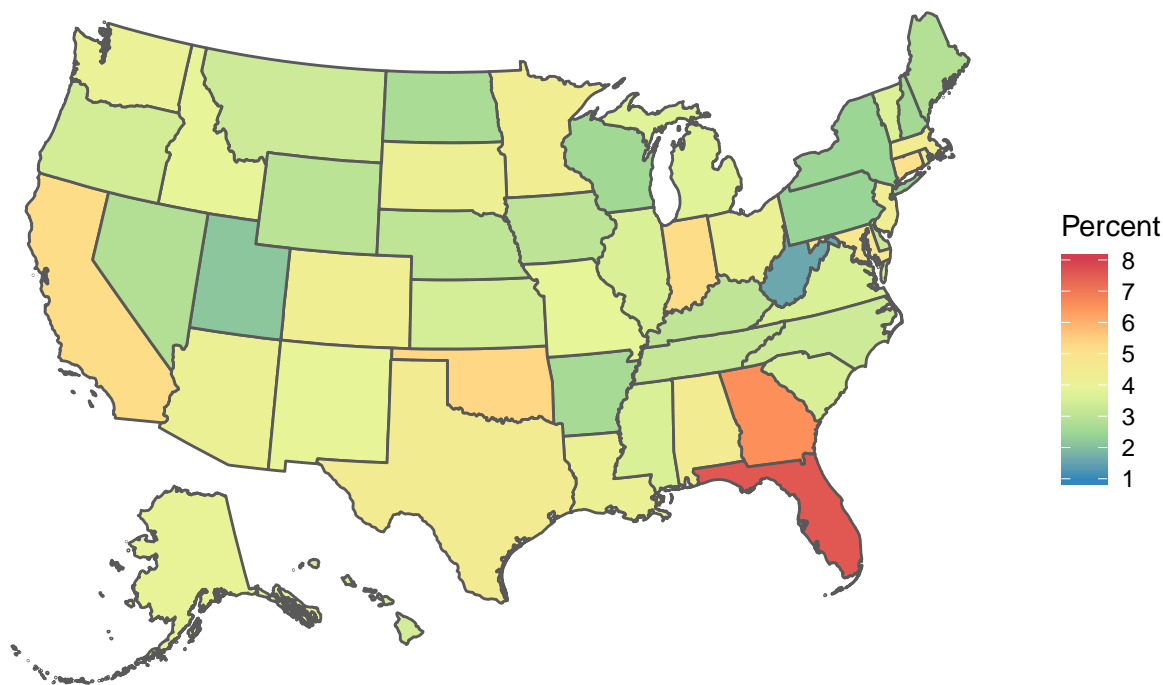

```
#1980
ggplot(usa.1980) +
  geom_sf(aes(geometry = geometry, fill=density)) +
  coord_sf(crs=2163)+
  scale_fill_distiller(palette = "Spectral",
                       breaks = c(seq(0,13,2)),
                       limits = c(0,13),
                       name = "Percent") +
  ggtitle("Ex-Felon Density in the United States: 1980",
          subtitle = "Shannon et al. 2017")+
  theme(axis.text = element_blank(),
  axis.line = element_blank(),
  axis.ticks = element_blank(),
  panel.border = element_blank(),
  panel.grid = element_blank(),
  axis.title = element_blank(),
  panel.background = element_blank(),
  panel.grid.major = element_line(colour="transparent"), #Removes graticule lines
  plot.subtitle = element_text(face="italic"))
```

Ex–Felon Density in the United States: 1980
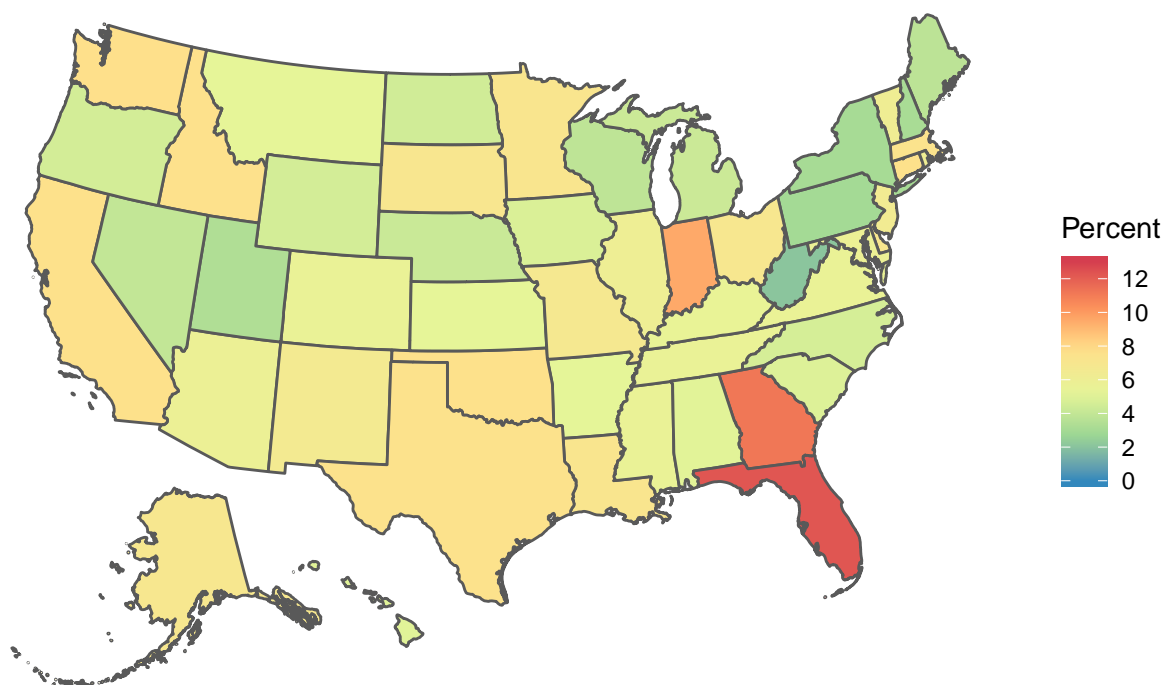
Shannon et al. 2017


```
#2010
ggplot(usa.2010) +
  geom_sf(aes(geometry = geometry, fill=density)) +
  coord_sf(crs=2163)+
  scale_fill_distiller(palette = "Spectral",
                       breaks = c(seq(0,13,2)),
                       limits = c(0,13),
                       name = "Percent") +
  ggtitle("Ex-Felon Density in the United States: 2010",
          subtitle = "Shannon et al. 2017")+
  theme(axis.text = element_blank(),
  axis.line = element_blank(),
  axis.ticks = element_blank(),
  panel.border = element_blank(),
  panel.grid = element_blank(),
  axis.title = element_blank(),
  panel.background = element_blank(),
  panel.grid.major = element_line(colour="transparent"), #Removes graticule lines
  plot.subtitle = element_text(face="italic"))
```

Ex–Felon Density in the United States: 2010
Shannon et al. 2017


```
usa.t <- states %>% inner_join(., fd.t, by = "id") #fd.t being state-year dataframe

map <- ggplot(usa.t) +
  geom_sf(aes(geometry = geometry, fill=density, frame = YEAR)) + #frame = specifies animation
    coord_sf(crs=2163)+
  scale_fill_distiller(palette = "Spectral",
                       breaks = c(seq(0,13,2)),
                       limits = c(0,13),
                       name = "Percent") +
  ggtitle("Ex-Felon Density in the United States: ",
          subtitle = "Shannon et al. 2017")+
  theme(axis.text = element_blank(),
  axis.line = element_blank(),
  axis.ticks = element_blank(),
  panel.border = element_blank(),
  panel.grid = element_blank(),
  axis.title = element_blank(),
  panel.background = element_blank(),
  plot.subtitle = element_text(face="italic"),
  panel.grid.major = element_line(colour="transparent"),
  plot.title = element_text(face="bold"))

## Warning: Ignoring unknown aesthetics: frame

gganimate(map, interval=1.5, ani.width = 750, ani.height = 450,
          filename = "density_time.gif", saver = "gif", title_frame = TRUE)

## Executing:
## "convert -loop 0 -delay 150 Rplot1.png Rplot2.png Rplot3.png
```

```
##      Rplot4.png Rplot5.png Rplot6.png Rplot7.png Rplot8.png
##      Rplot9.png Rplot10.png Rplot11.png Rplot12.png Rplot13.png
##      Rplot14.png Rplot15.png Rplot16.png Rplot17.png Rplot18.png
##      Rplot19.png Rplot20.png Rplot21.png Rplot22.png Rplot23.png
##      Rplot24.png Rplot25.png Rplot26.png Rplot27.png Rplot28.png
##      Rplot29.png Rplot30.png Rplot31.png "density_time.gif""

## Output at: density_time.gif
```