

Death Penalty Econometrics

```
. use "deathpenalty.dta", replace
```

```
. summ
```

Variable	Obs	Mean	Std. Dev.	Min	Max
year	3825	1967	21.65154	1930	2004
state	3672	26	14.72161	1	51
popul	3575	3940.48	4427.51	96	35484.45
pc_mur	3503	6.957713	6.431243	0	80.6
age15to19	3414	.0835766	.0113357	.0565088	.1262065
age20to24	3414	.0786225	.011069	.0512788	.1241082
nonwhite	3561	.1304581	.1354227	0	.7589487
ur	2295	5.667887	1.998854	1.8	17.4
rpc_inc	3638	98.21574	45.23577	9.769231	274.235
statename	0				
ipolice	2009	1377.627	1500.322	71	10626
legal	3825	.7550327	.4301241	0	1
sample_ds	2009	1	0	1	1
decade_ds	3825	1962.667	21.74885	1930	2000

```
. tab decade_ds sample_ds
```

decade_ds	sample_ds		Total
	0	1	
1930	510	0	510
1940	510	0	510
1950	510	0	510
1960	0	510	510
1970	0	510	510
1980	0	510	510
1990	0	510	510
2000	204	51	255
Total	1,734	2,091	3,825

```
. tab statename
```

statename	Freq.	Percent	Cum.
Alabama	26	1.96	1.96
Alaska	26	1.96	3.92
Arizona	26	1.96	5.88
Connecticut	26	1.96	13.73
Delaware	26	1.96	15.69
District of Columbia	26	1.96	17.65
Florida	26	1.96	19.61
...			
West Virginia	26	1.96	96.08
Wisconsin	26	1.96	98.04
Wyoming	26	1.96	100.00
Total	1,326	100.00	

Death Penalty Econometrics

Basic OLS model:

```
. reg pc_mur legal rpc_inc ur ipolice nonwhite age15to19 age20to24 if sample_ds==1
```

Source	SS	df	MS	Number of obs = 2009		
Model	18119.5849	7	2588.51212	F(7, 2001) = 462.36		
Residual	11202.5342	2001	5.59846785	Prob > F = 0.0000		
Total	29322.119	2008	14.6026489	R-squared = 0.6179		
				Adj R-squared = 0.6166		
				Root MSE = 2.3661		

pc_mur	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
legal	.1207065	.124588	0.97	0.333	-.1236294	.3650423
rpc_inc	-.0175036	.002774	-6.31	0.000	-.0229438	-.0120634
ur	.1637506	.0279443	5.86	0.000	.1089477	.2185535
ipolice	.000412	.0000408	10.09	0.000	.0003319	.0004921
nonwhite	26.02953	.6185301	42.08	0.000	24.8165	27.24256
age15to19	-.3294123	9.859352	-0.03	0.973	-19.66508	19.00626
age20to24	89.7912	7.856899	11.43	0.000	74.38264	105.1998
_cons	-3.203597	.79637	-4.02	0.000	-4.765398	-1.641796

Add robust standard errors

```
. reg pc_mur legal rpc_inc ur ipolice nonwhite age15to19 age20to24 if sample_ds==1, robust
```

Linear regression

Number of obs = 2009
F(7, 2001) = 420.46
Prob > F = 0.0000
R-squared = 0.6179
Root MSE = 2.3661

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
legal	.1207065	.127046	0.95	0.342	-.1284498	.3698627
rpc_inc	-.0175036	.0028017	-6.25	0.000	-.0229982	-.0120091
ur	.1637506	.0268636	6.10	0.000	.111067	.2164342
ipolice	.000412	.0000578	7.13	0.000	.0002986	.0005254
nonwhite	26.02953	.7019208	37.08	0.000	24.65296	27.40611
age15to19	-.3294123	10.26321	-0.03	0.974	-20.4571	19.79828
age20to24	89.7912	8.672623	10.35	0.000	72.78288	106.7995
_cons	-3.203597	.7632729	-4.20	0.000	-4.70049	-1.706704

Death Penalty Econometrics

Weight by population

```
. reg pc_mur legal rpc_inc ur ipolice nonwhite age15to19 age20to24 [w=popul] if
sample_ds==1, robust
(analytic weights assumed)
(sum of wgt is 9.2562e+06)
```

Linear regression

Number of obs = 2009
F(7, 2001) = 250.07
Prob > F = 0.0000
R-squared = 0.5320
Root MSE = 2.4697

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
legal	-.7308648	.192469	-3.80	0.000	-1.108325	-.3534043
rpc_inc	-.0352761	.0040144	-8.79	0.000	-.0431489	-.0274032
ur	.0950243	.0389936	2.44	0.015	.0185521	.1714966
ipolice	.0002333	.0000697	3.35	0.001	.0000966	.0003699
nonwhite	23.97303	1.231742	19.46	0.000	21.5574	26.38866
age15to19	-72.01421	18.53364	-3.89	0.000	-108.3615	-35.66696
age20to24	181.6098	16.75583	10.84	0.000	148.7491	214.4705
_cons	-.2300067	1.159688	-0.20	0.843	-2.50433	2.044317

Add non-linear year/trend effects to capture nationwide trends: year and year^2

```
. reg pc_mur year year2 legal rpc_inc ur ipolice nonwhite age15to19 age20to24
[w=popul] if sample_ds==1, robust
```

(analytic weights assumed)
(sum of wgt is 9.2562e+06)

Linear regression

Number of obs = 2009
F(8, 1999) = .
Prob > F = .
R-squared = 0.6178
Root MSE = 2.233

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
year	63.26356	4.135698	15.30	0.000	55.15283	71.37429
year2	-.0159688	.0010444	-15.29	0.000	-.0180171	-.0139205
legal	-.6499568	.1680391	-3.87	0.000	-.9795069	-.3204066
rpc_inc	-.0537092	.0051678	-10.39	0.000	-.063844	-.0435744
ur	-.1161543	.0365967	-3.17	0.002	-.1879259	-.0443826
ipolice	.0003459	.0000641	5.39	0.000	.0002201	.0004716
nonwhite	27.57102	1.038276	26.55	0.000	25.53481	29.60724
age15to19	-100.7504	17.06707	-5.90	0.000	-134.2215	-67.27925
age20to24	55.25224	14.45761	3.82	0.000	26.89869	83.6058
_cons	-62641.11	4092.702	-15.31	0.000	-70667.52	-54614.7

Death Penalty Econometrics

Switch to annual dummies to capture nationwide trends

```
. reg pc_mur i.year legal rpc_inc ur ipolice nonwhite age15to19 age20to24 [w=popul]
if sample_ds==1, robust
```

(analytic weights assumed)
(sum of wgt is 9.2562e+06)

Linear regression

Number of obs = 2009
F(47, 1961) = 73.60
Prob > F = 0.0000
R-squared = 0.6578
Root MSE = 2.1332

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
year						
1961	-.0497728	.4261524	-0.12	0.907	-.885532	.7859863
1962	-.0882329	.3966126	-0.22	0.824	-.8660593	.6895936
1963	.0784412	.4074417	0.19	0.847	-.720623	.8775054
1964	.6433393	.4078287	1.58	0.115	-.1564839	1.443162
1965	1.11853	.435022	2.57	0.010	.2653755	1.971684
1966	1.845458	.5132694	3.60	0.000	.8388469	2.852068
1967	2.590967	.5398682	4.80	0.000	1.532192	3.649743
1968	3.572926	.5963951	5.99	0.000	2.403292	4.742561
1969	4.150742	.6326232	6.56	0.000	2.910058	5.391427
1970	5.018086	.6626286	7.57	0.000	3.718556	6.317616
1971	5.741289	.6691044	8.58	0.000	4.429059	7.05352
1982	5.58489	.9082887	6.15	0.000	3.803578	7.366203
1983	4.684894	.8448699	5.55	0.000	3.027957	6.341831
1984	4.335682	.7683155	5.64	0.000	2.828881	5.842483
1985	4.31287	.7436268	5.80	0.000	2.854488	5.771251
1986	4.857039	.7414294	6.55	0.000	3.402966	6.311111
1987	4.372161	.6862741	6.37	0.000	3.026258	5.718064
1988	4.3429	.6888103	6.30	0.000	2.992023	5.693778
1989	4.47291	.6444019	6.94	0.000	3.209126	5.736695
1990	4.930127	.6848555	7.20	0.000	3.587006	6.273249
1991	5.051174	.7144175	7.07	0.000	3.650076	6.452271
1992	4.584333	.6333575	7.24	0.000	3.342209	5.826458
1993	4.423285	.5969537	7.41	0.000	3.252555	5.594015
1994	3.697887	.5821342	6.35	0.000	2.55622	4.839554
1995	2.876725	.5691268	5.05	0.000	1.760568	3.992882
1996	1.940823	.6732191	2.88	0.004	.620523	3.261123
1997	1.32487	.7646859	1.73	0.083	-.1748121	2.824553
1998	.9202979	.84482	1.09	0.276	-.7365414	2.577137
1999	.2262769	.840845	0.27	0.788	-1.422767	1.875321
2000	.156641	.7887682	0.20	0.843	-1.390271	1.703553
legal	-.2168778	.183731	-1.18	0.238	-.5772063	.1434507
rpc_inc	-.0548412	.0053526	-10.25	0.000	-.0653387	-.0443437
ur	-.0886884	.0564621	-1.57	0.116	-.1994205	.0220437
ipolice	.0002947	.0000659	4.48	0.000	.0001656	.0004239
nonwhite	27.47081	1.002368	27.41	0.000	25.50499	29.43663
age15to19	-133.1528	20.83323	-6.39	0.000	-174.0104	-92.29518
age20to24	69.33086	14.0073	4.95	0.000	41.8601	96.80162
_cons	12.14572	1.645244	7.38	0.000	8.919112	15.37233

Death Penalty Econometrics

Instead, add state dummies to capture state effects

```
. xi i.state
i.state          _Istate_1-51      (naturally coded; _Istate_1 omitted)

. reg pc_mur _I* legal rpc_inc ur ipolice nonwhite age15to19 age20to24 [w=popul] if
sample_ds==1, robust
```

(analytic weights assumed)
(sum of wgt is 9.2562e+06)
note: _Istate_9 omitted because of collinearity
note: _Istate_12 omitted because of collinearity

Linear regression	Number of obs	=	2,009
	F(55, 1953)	=	158.55
	Prob > F	=	0.0000
	R-squared	=	0.7744
	Root MSE	=	1.7357

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
_Istate_2	-5.580617	.6612569	-8.44	0.000	-6.877461	-4.283774
_Istate_3	-3.983527	.6438932	-6.19	0.000	-5.246317	-2.720737
_Istate_4	-1.633964	.5005549	-3.26	0.001	-2.615642	-.6522858
_Istate_5	-5.620888	1.088534	-5.16	0.000	-7.755698	-3.486078
_Istate_6	-6.707169	.7865122	-8.53	0.000	-8.24966	-5.164677
_Istate_7	-7.135097	.8449871	-8.44	0.000	-8.792269	-5.477926
_Istate_8	-6.34554	.5855267	-10.84	0.000	-7.493863	-5.197217
_Istate_9	0	(omitted)				
_Istate_10	-.8448648	.6663287	-1.27	0.205	-2.151655	.4619252
_Istate_11	-.699204	.5302042	-1.32	0.187	-1.73903	.3406215
_Istate_12	0	(omitted)				

_Istate_35	-11.36859	.8681908	-13.09	0.000	-13.07127	-9.665914
_Istate_36	-5.895984	.7086951	-8.32	0.000	-7.285862	-4.506106
_Istate_37	-4.248394	.5803752	-7.32	0.000	-5.386614	-3.110174
_Istate_38	-7.125939	.8433578	-8.45	0.000	-8.779914	-5.471963
_Istate_39	-6.772212	.9131019	-7.42	0.000	-8.562968	-4.981455
_Istate_40	-10.10624	.8008859	-12.62	0.000	-11.67692	-8.535559
_Istate_41	-1.708332	.5024256	-3.40	0.001	-2.693679	-.7229856
_Istate_42	-8.34225	.8055021	-10.36	0.000	-9.921984	-6.762515
_Istate_43	-2.253562	.5175543	-4.35	0.000	-3.268579	-1.238545
_Istate_44	-2.151726	.8043685	-2.68	0.008	-3.729237	-.5742153
_Istate_45	-10.13476	.802411	-12.63	0.000	-11.70843	-8.561085
_Istate_46	-10.35646	.9288963	-11.15	0.000	-12.17819	-8.534723
_Istate_47	-4.823261	.4986819	-9.67	0.000	-5.801265	-3.845256
_Istate_48	-7.792464	.7819516	-9.97	0.000	-9.326011	-6.258916
_Istate_49	-6.248386	.8563901	-7.30	0.000	-7.927921	-4.568851
_Istate_50	-9.364145	.8352827	-11.21	0.000	-11.00228	-7.726006
_Istate_51	-6.349986	.9193371	-6.91	0.000	-8.152971	-4.547001
legal	-1.305985	.1963016	-6.65	0.000	-1.690967	-.921002
rpc_inc	-.003218	.0053151	-0.61	0.545	-.0136419	.0072059
ur	-.000761	.0356457	-0.02	0.983	-.0706687	.0691466
ipolice	.0003417	.0001372	2.49	0.013	.0000727	.0006106
nonwhite	-.3245782	3.239583	-0.10	0.920	-6.677982	6.028825
age15to19	-52.21353	16.88113	-3.09	0.002	-85.32045	-19.1066
age20to24	169.2417	15.97533	10.59	0.000	137.9112	200.5722
_cons	4.094475	1.359369	3.01	0.003	1.428509	6.760441

Death Penalty Econometrics

Kitchen Sink: include state and year fixed effects

```
. reg pc_mur _I* i.year legal rpc_inc ur ipolice nonwhite age15to19 age20to24
[w=popul] if sample_ds==1, robust
```

(analytic weights assumed)

(sum of wgt is 9.2562e+06)

note: _Istate_9 omitted because of collinearity

note: _Istate_12 omitted because of collinearity

```
Linear regression               Number of obs   =      2,009
                               F(95, 1913)       =      111.50
                               Prob > F          =       0.0000
                               R-squared         =       0.8414
                               Root MSE      =       1.4706
```

pc_mur	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
_Istate_2	-2.131986	.8103989	-2.63	0.009	-3.721344	-.5426272
_Istate_3	-1.723821	.5845118	-2.95	0.003	-2.870168	-.5774732
_Istate_49	-2.923823	.7904653	-3.70	0.000	-4.474088	-1.373559
_Istate_50	-6.560536	.7915397	-8.29	0.000	-8.112908	-5.008164
_Istate_51	-4.141317	.8541831	-4.85	0.000	-5.816545	-2.466089
year						
1961	-.326701	.5364853	-0.61	0.543	-1.378858	.7254565
1962	-1.072561	.5271778	-2.03	0.042	-2.106465	-.0386574
1963	-1.411219	.5325338	-2.65	0.008	-2.455627	-.3668112
1985	.5990855	.8117886	0.74	0.461	-.9929982	2.191169
1986	1.39662	.8140406	1.72	0.086	-.1998799	2.993121
1987	1.171172	.7825323	1.50	0.135	-.3635337	2.705878
1988	1.404841	.7653576	1.84	0.067	-.0961821	2.905864
1989	1.844572	.7490038	2.46	0.014	.3756221	3.313522
1990	2.966777	.7434248	3.99	0.000	1.508769	4.424786
1991	3.569206	.7631727	4.68	0.000	2.072469	5.065944
1992	3.229825	.7754632	4.17	0.000	1.708983	4.750668
1993	3.242309	.8007012	4.05	0.000	1.67197	4.812648
1994	2.52262	.7702362	3.28	0.001	1.012029	4.033211
1995	1.647133	.8062576	2.04	0.041	.0658969	3.228369
1996	.737552	.7860583	0.94	0.348	-.8040693	2.279173
1997	.0389106	.8067846	0.05	0.962	-1.543359	1.62118
1998	-.5938108	.8629558	-0.69	0.491	-2.286244	1.098622
1999	-1.273067	.8810761	-1.44	0.149	-3.001038	.4549035
2000	-1.51468	.880319	-1.72	0.085	-3.241166	.2118059
legal	-.4724342	.237106	-1.99	0.046	-.9374476	-.0074208
rpc_inc	-.0025453	.0086651	-0.29	0.769	-.0195393	.0144487
ur	-.2292825	.0436833	-5.25	0.000	-.3149543	-.1436107
ipolice	-.0001523	.0001221	-1.25	0.212	-.0003917	.0000871
nonwhite	10.81947	3.201731	3.38	0.001	4.540222	17.09872
age15to19	62.09126	20.7332	2.99	0.003	21.4292	102.7533
age20to24	75.12214	16.67801	4.50	0.000	42.41315	107.8311
_cons	-1.053707	1.953469	-0.54	0.590	-4.884859	2.777446

Death Penalty Econometrics

Summary:

	(1) OLS pc_mur	(2) +robust pc_mur	(3) +pop wgt pc_mur	(4) +yearFES pc_mur	(5) or+stateFES pc_mur	(6) KitchSink pc_mur
legal	0.121 (0.97)	0.121 (0.95)	-0.731*** (-3.80)	-0.217 (-1.18)	-1.306*** (-6.65)	-0.472* (-1.99)
rpc_inc	-0.0175*** (-6.31)	-0.0175*** (-6.25)	-0.0353*** (-8.79)	-0.0548*** (-10.25)	-0.00322 (-0.61)	-0.00255 (-0.29)
ur	0.164*** (5.86)	0.164*** (6.10)	0.0950* (2.44)	-0.0887 (-1.57)	-0.000761 (-0.02)	-0.229*** (-5.25)
ipolice	0.000412*** (10.09)	0.000412*** (7.13)	0.000233*** (3.35)	0.000295*** (4.48)	0.000342* (2.49)	-0.000152 (-1.25)
nonwhite	26.03*** (42.08)	26.03*** (37.08)	23.97*** (19.46)	27.47*** (27.41)	-0.325 (-0.10)	10.82*** (3.38)
age15to19	-0.329 (-0.03)	-0.329 (-0.03)	-72.01*** (-3.89)	-133.2*** (-6.39)	-52.21** (-3.09)	62.09** (2.99)
age20to24	89.79*** (11.43)	89.79*** (10.35)	181.6*** (10.84)	69.33*** (4.95)	169.2*** (10.59)	75.12*** (4.50)
N	2009	2009	2009	2009	2009	2009
R-sq	0.618	0.618	0.532	0.658	0.774	0.841
adj. R-sq	0.617	0.617	0.530	0.650	0.768	0.833

t statistics in parentheses
 * p<0.05, ** p<0.01, *** p<0.001