

Regression Analysis

The regression equation is

$$\text{Unemployment Rate} = 0.07303 - 1.205 \text{ Crime Rate} + 20.03 \text{ Crime Rate}^2$$

$$S = 0.0152571 \quad R\text{-Sq} = 12.4\% \quad R\text{-Sq}(\text{adj}) = 9.2\%$$

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	2	0.0017839	0.0008920	3.83	0.028
Error	54	0.0125700	0.0002328		
Total	56	0.0143539			

Sequential Analysis of Variance

Source	DF	SS	F	P
Linear	1	0.0014006	5.95	0.018
Quadratic	1	0.0003834	1.65	0.205

Data

The purpose of my study was to determine whether crime and unemployment rates were related. I hypothesized that crime would increase as a result of unemployment. All my data was collected from federal websites. The crime rates data was from the FBI UCS Annual Crime Reports. The data was recorded for people seeking information on crime rates and was "produced from data received from over 18,000 law enforcement agencies voluntarily participating in the program." The number of crime done in a year is listed along with the population size of the US for that year. The website which I collected the unemployment data from does not indicate the method of collection. However, it was taken from the US Department of Labor Statistics, so it is probably using the census. The purpose of that particular website was to compare unemployment rates to GDP rates. It gives the unemployment rates by year, and I used that for my study. The unemployment rates data seemed pretty random. The website gave reasoning as to why the rates were higher or lower certain years (ex; the Great Depression). In both cases, the population of the US should have been the population of interest.

Percent	Number of crimes	Year	Population	Crime Rate	Unemployment Rate
6.6	3384200	1960	179323175	0.01887207	0.066
6	3488000	1961	182992000	0.01906094	0.06
5.5	3752200	1962	185771000	0.02019799	0.055
5.5	4109500	1963	188483000	0.02180303	0.055
5	4564600	1964	191141000	0.0238808	0.05
4	4739400	1965	193526000	0.02448973	0.04
3.8	5223500	1966	195576000	0.02670829	0.038
3.8	5903400	1967	197457000	0.02989714	0.038

3.4	6720200	1968	199399000	0.03370228	0.034
3.5	7410900	1969	201385000	0.03679966	0.035
6.1	8098000	1970	203235298	0.03984544	0.061
6	8588200	1971	206212000	0.04164743	0.06
5.2	8248800	1972	208230000	0.03961389	0.052
4.9	8718100	1973	209851000	0.04154424	0.049
7.2	10253400	1974	211392000	0.0485042	0.072
8.2	11292400	1975	213124000	0.05298512	0.082
7.8	11349700	1976	214659000	0.05287316	0.078
6.4	10984500	1977	216332000	0.05077612	0.064
6	11209000	1978	218059000	0.05140352	0.06
6	12249500	1979	220099000	0.0556545	0.06
7.2	13408300	1980	225349264	0.05950008	0.072
8.5	13423800	1981	229146000	0.05858186	0.085
10.8	12974400	1982	231534000	0.05603669	0.108
8.3	12108600	1983	233981000	0.05175036	0.083
7.3	11881800	1984	236158000	0.05031293	0.073
7	12431400	1985	238740000	0.05207087	0.07
6.6	13211869	1986	240132887	0.05501899	0.066
5.7	13508700	1987	242282918	0.05575589	0.057
5.3	13923100	1988	245807000	0.05664241	0.053
5.4	14251400	1989	248239000	0.05741	0.054
6.3	14475600	1990	248709873	0.05820276	0.063
7.3	14872900	1991	252177000	0.05897802	0.073
7.4	14483200	1992	255082000	0.0567786	0.074
6.5	14144800	1993	257908000	0.05484436	0.065
5.5	13989500	1994	260341000	0.05373529	0.055
5.6	13862700	1995	262755000	0.05275903	0.056
5.4	13493863	1996	265228572	0.05087636	0.054
4.7	13194571	1997	267637000	0.04930025	0.047
4.4	12475634	1998	270296000	0.04615545	0.044
4	11634378	1999	272690813	0.04266509	0.04
3.9	11608072	2000	281421906	0.04124793	0.039
5.7	11876669	2001	285317559	0.04162614	0.057
6	11878954	2002	287973924	0.0412501	0.06
5.7	11826538	2003	290690788	0.04068425	0.057
5.4	11679474	2004	293656842	0.03977252	0.054
4.9	11565499	2005	296507061	0.03900581	0.049
4.4	11401511	2006	299398484	0.03808139	0.044
5	11251828	2007	301621157	0.03730451	0.05
7.3	11160543	2008	304374846	0.0366671	0.073
9.9	10762956	2009	307006550	0.03505774	0.099
9.3	10363873	2010	309330219	0.03350424	0.093

8.5	10258774	2011	311587816	0.03292418	0.085
7.9	10219059	2012	313873685	0.03255787	0.079
6.7	9850445	2013	316497531	0.03112329	0.067
5.6	9395195	2014	318907401	0.02946057	0.056
5	9258298	2015	320896618	0.02885134	0.05
4.7	9202093	2016	323127513	0.02847821	0.047

Unemployment data: <https://www.thebalance.com/unemployment-rate-by-year-3305506v>
11/15/2017

Crime data: <http://www.disastercenter.com/crime/uscrime.htm> 11/15/2017

Descriptive Statistics

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3
Crime Rate	57	0	0.04237	0.00157	0.01187	0.01887	0.03321	0.04154	0.05293
Unemployment Rate	57	0	0.06070	0.00212	0.01601	0.03400	0.05000	0.05700	0.07200

Variable	Maximum
Crime Rate	0.05950
Unemployment Rate	0.10800