STATISTICS FOR BUSINESS ANALYTICS

STATISTICAL ANALYSIS
USING SPSS

Project Report: Employment of People Released from Prison

Abstract

This report contains the analysis of the study population containing 51,500 people from Federal Bureau of Prisons (BOP) who were employed during a 16 quarter period after release from prison in 2010 , by the type of crime committed. After serving time in prison and getting released, the job search begins. However, many find it difficult to get a job due to their criminal history. This poses the question: **does the type of crime committed affect a person's rate of employment after release from prison?**

Hypotheses

Ho: There is NOT a relationship between the type of crime committed and percentage of employment after release from prison (employment rates of each type of crime are equal).

Ha: There IS a relationship between the type of crime committed and the percentage of employment after release from prison (employment rates of each type of crime are not all equal).

Analysis

The analysis was done on the study population of 51,500 people based on the type of crime committed and the percentage of the same group that got a job within the 16-quarter period after their release from prison.

The input data was taken from Table 5 of the Bureau of Justice's report, "Employment of Persons Released From Federal Prison in 2010". The cleaned data is shown below:

	A	B	C	D	E	F
1	Quarter	Violent	Property	Drug	Public	Other
2	1	27.7	32.1	41.6	29.4	28.3
3	2	33.1	36.1	44.1	32.7	34.3
4	3	34	36.7	44.4	32.7	33.6
5	4	33.4	36.2	43.8	32.7	34.3
6	5	33.3	36	43.5	32.3	37
7	6	32.3	36.1	43	31.8	37.8
8	7	32.9	36	42.6	31.7	37.5
9	8	32.8	35.6	42.4	31.2	39.3
10	9	32.6	35.7	42	31	38.5
11	10	32.5	35.9	41.7	30.7	37.5
12	11	31.3	35.7	41.6	30.5	37.5
13	12	30.5	35.5	41.2	30.3	35.6
14	13	31.6	35.2	40.7	30.2	36.4
15	14	31.6	35	39.9	30.4	35.4
16	15	31.2	35.1	39.8	30.3	36.7
17	16	31.2	35.2	39.2	30.6	35.4
18	17	31.2	35.3	39.5	30.7	36.5

The categories of crimes are drug (possessing, manufacturing, and/or distributing), public order (disorderly conduct, rioting, gang activity), property (burglary, shoplifting, vandalism), violent (murder, assault, robbery), and other (fraud, drunk driving).

The regression analysis output is shown below:

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Crime=Violent, Crime=Other, Crime=Public Order, Crime=Drug[b]	.	Enter

a. Dependent Variable: Percent

b. Tolerance = .000 limit reached.

We set the employment rates as the dependent variable and dummy variables as each type of crime.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924[a]	.853	.846	1.61968

a. Predictors: (Constant), Crime=Violent, Crime=Other, Crime=PublicOrder, Crime=Drug

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1223.405	5	244.681	94.553	<.001[b]
	Residual	204.433	79	2.588		
	Total	1427.838	84			

a. Dependent Variable: EmPerc

b. Predictors: (Constant), Quarter, Crime=Violent, Crime=Other, Crime=PublicOrd, Crime=Drug

The R-squared value is 0.853, which means about 86% of variation in the data can be explained by our model. Using ANOVA, we got a p-value less than 0.01. Thus, we can reject our null hypothesis. We can conclude that employment rates of each type of crime are not all equal at the 0.05 level of significance.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	35.494	.393		90.355	<.001
	Crime=Drug	6.329	.556	.618	11.393	<.001
	Crime=Other	.482	.556	.047	.868	.388
	Crime=PublicOrder	-4.365	.556	-.426	-7.857	<.001
	Crime=Violent	-3.541	.556	-.346	-6.374	<.001

a. Dependent Variable: Percent

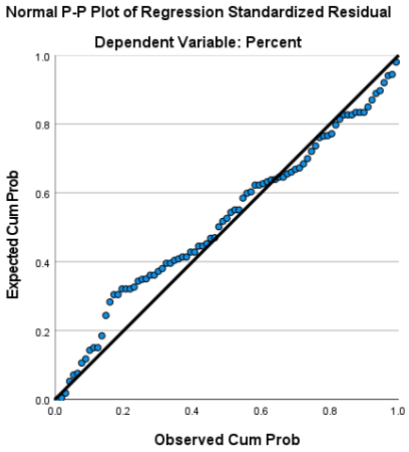
Excluded Variables[a]

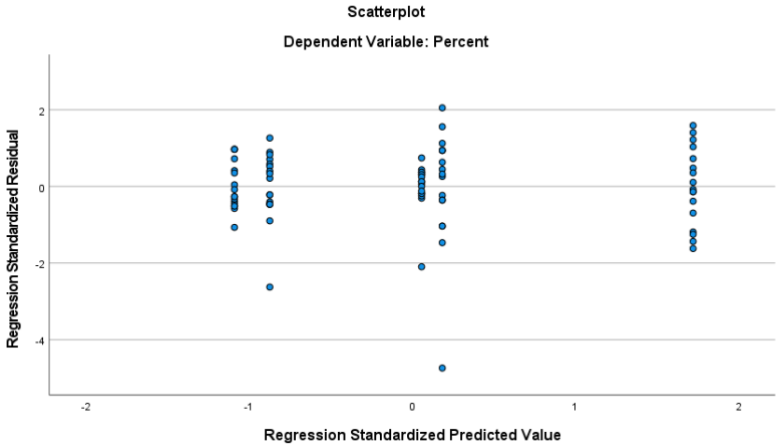
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	Crime=Property	.[b]	.	.	.	.000

a. Dependent Variable: Percent

b. Predictors in the Model: (Constant), Crime=Violent, Crime=Other, Crime=PublicOrder, Crime=Drug

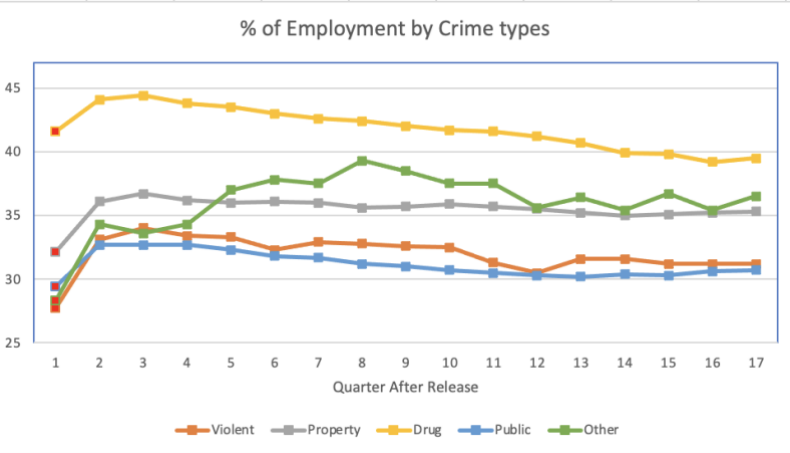
Shown above are the coefficients of each dummy variable. “Drug”, “Public Order”, and “Violent” coefficients are quite big. On the other hand, “Other” and “Property” coefficients are small. “Property” is even excluded.



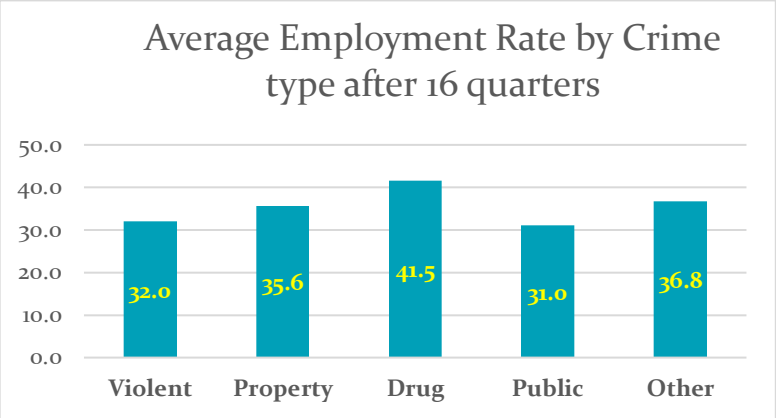


From our residual analysis, the residuals seem to be normally distributed and spread well

around zero. Thus, we can validate our model assumption.



The graph above shows the percentage of employment by crime types over 16 quarters. Employment rate in the "Drug" section is the highest in the beginning and decreases over time, showing that people in this section have a harder time maintaining jobs. Employment rate in the "Property" section stays constant if people secure jobs initially. Since these crimes affect possessions (such as shoplifting or vandalism) as opposed to people, the effect on society is less severe. The "Other" section fluctuates since this category contains a variety of crimes not classified in the data. Lastly, the "Violent" and "Public Order" sections have the lowest employment rates since these crimes are more detrimental to society.



The graph above shows the average employment rate for each type of crime after 16 quarters. The "Drug" section has the highest average employment at 41.5%, while the "Public Order" section has the lowest average employment at 31%. This can be explained by the fact that public order crimes go against the values of society, compared to drug related crimes which are more impactful at the individual level.

Limitations & Conclusion

A limitation we had was the fact that we only had types of crime committed but not the exact crimes listed (e.g., murder, robbery, etc.) and the amount of people who committed those crimes. Overall, we conclude that drug-related crimes are more of an individual-based crime, therefore they have the highest employment rate. On the other hand, public order crimes affect more people and go against values society shares as a whole, causing employment rate to be the lowest.

Works Cited

Carson, E. Ann, et al. "Employment of Persons Released from Federal Prison in 2010." Bureau of Justice Statistics, Bureau of Justice Statistics, Dec. 2021, https://bjs.ojp.gov/content/pub/pdf/eprfp10.pdf.