Guns In Public Hands

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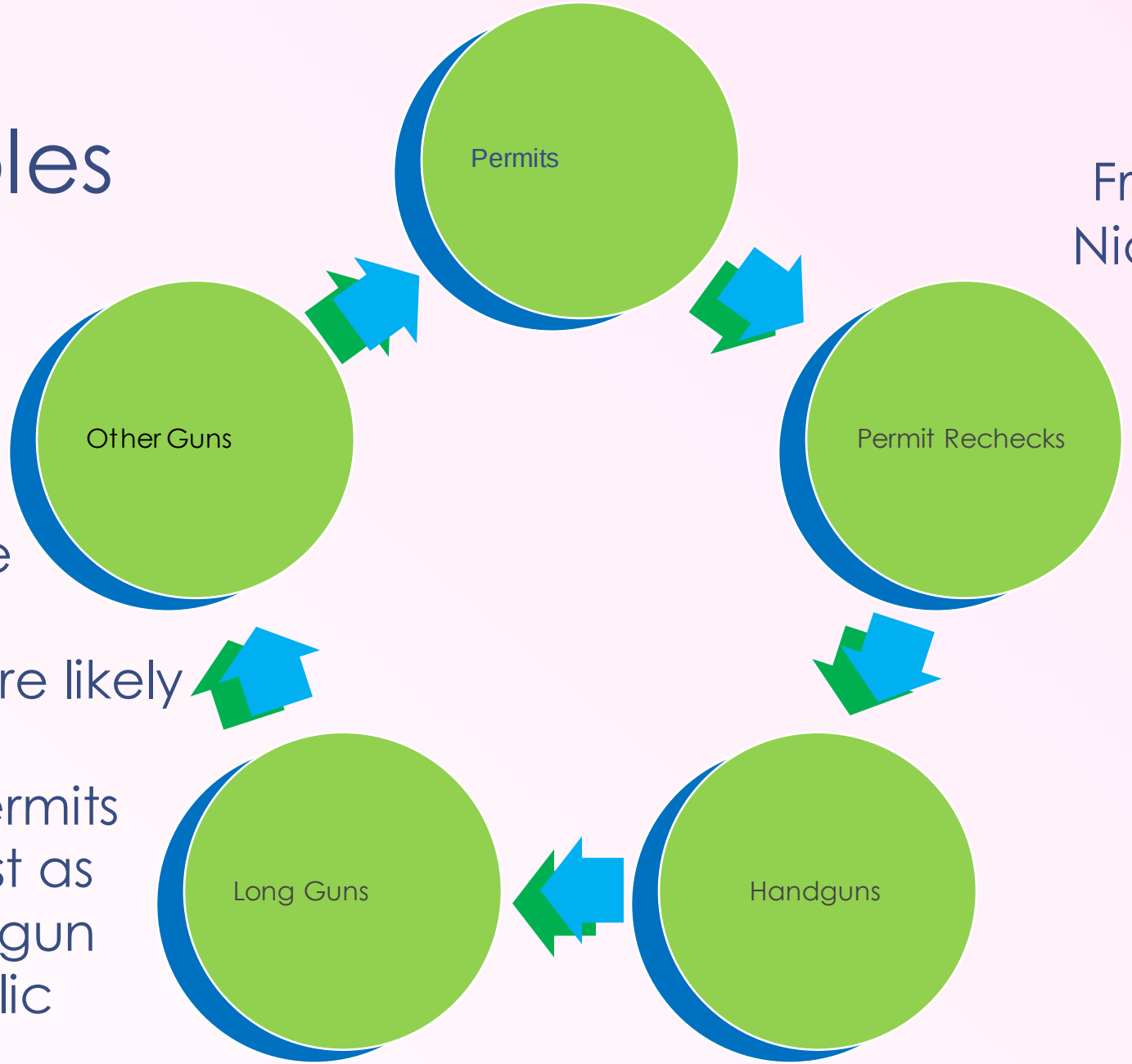
DSC530 t302

Variables

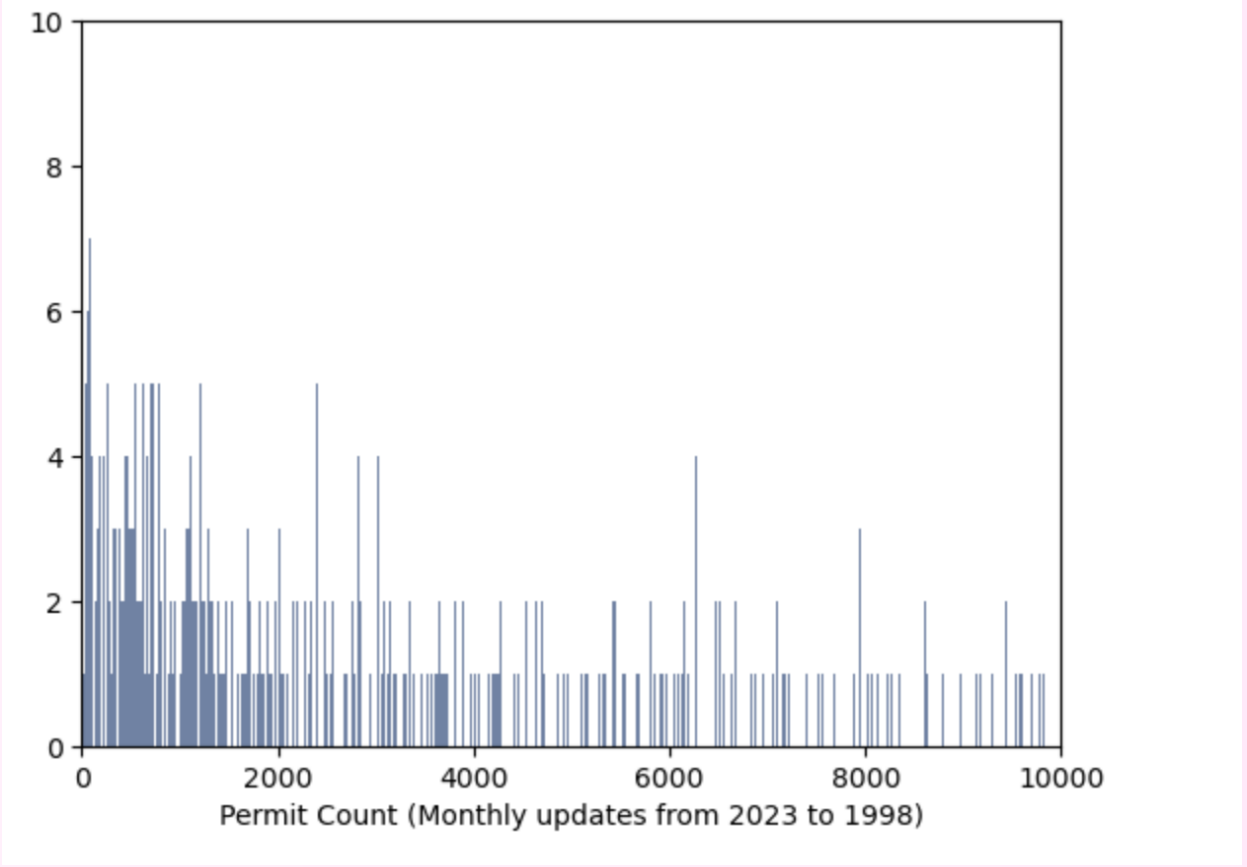


From the Data Set Nics Firearm Backgr ound Checks CVS File, the variables listed were chosen for the analysis

Guns are everywhere but are there restrictions? What guns are likely to be found in public? Permits should be just as common as gun sales for public safety.

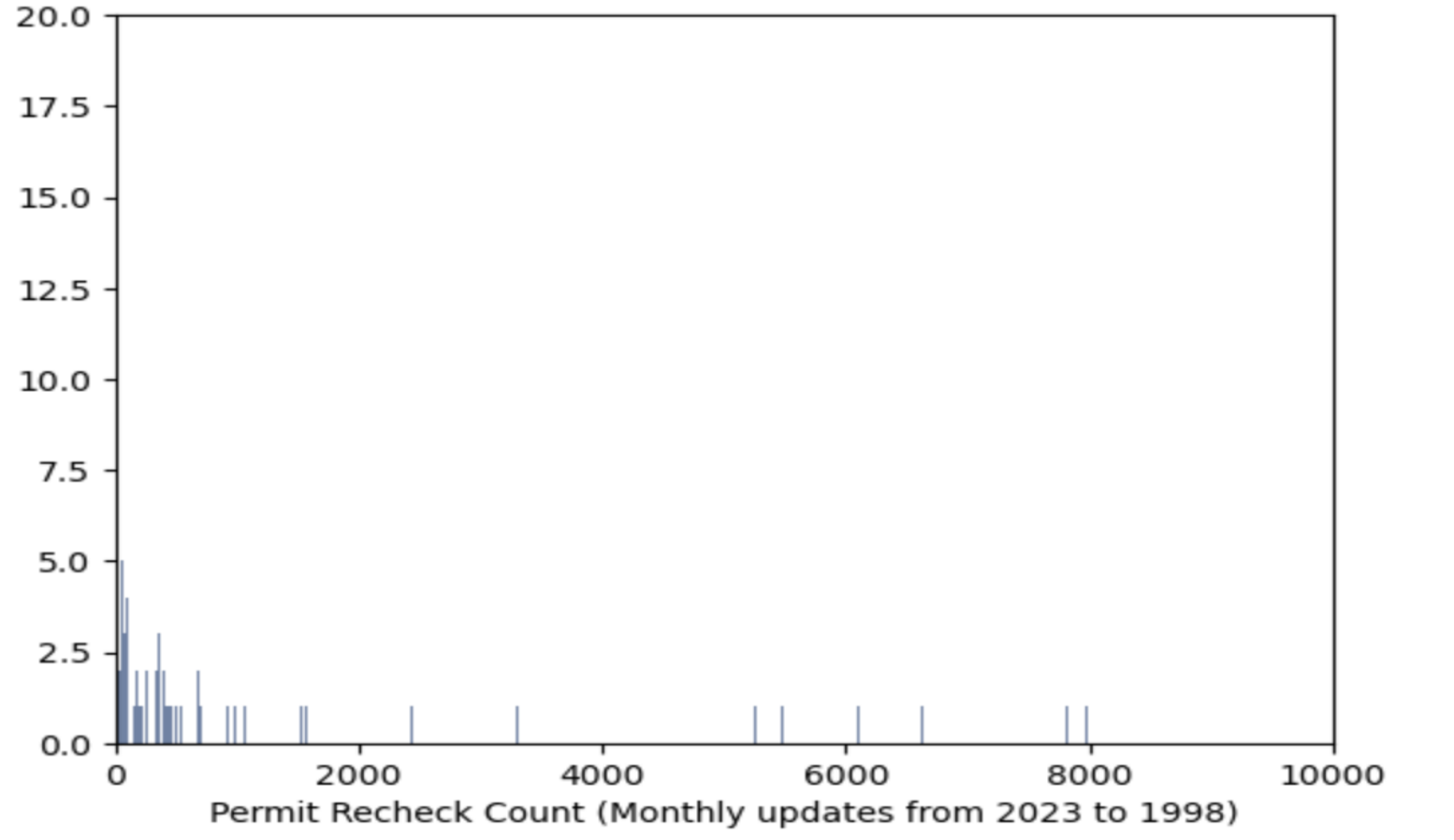
Permits

- Permit is the integer of the cumulative count of the number of permits within the designated month and state.
- This variable progressively gets smaller values with outliers that have an abnormal distance from other values throughout the counts. For the outliers it would be best to replace them with the mean value.



Permit Recheck

- Permit recheck is the integer of the cumulative count of the number of permits rechecks done within the designated month and state.

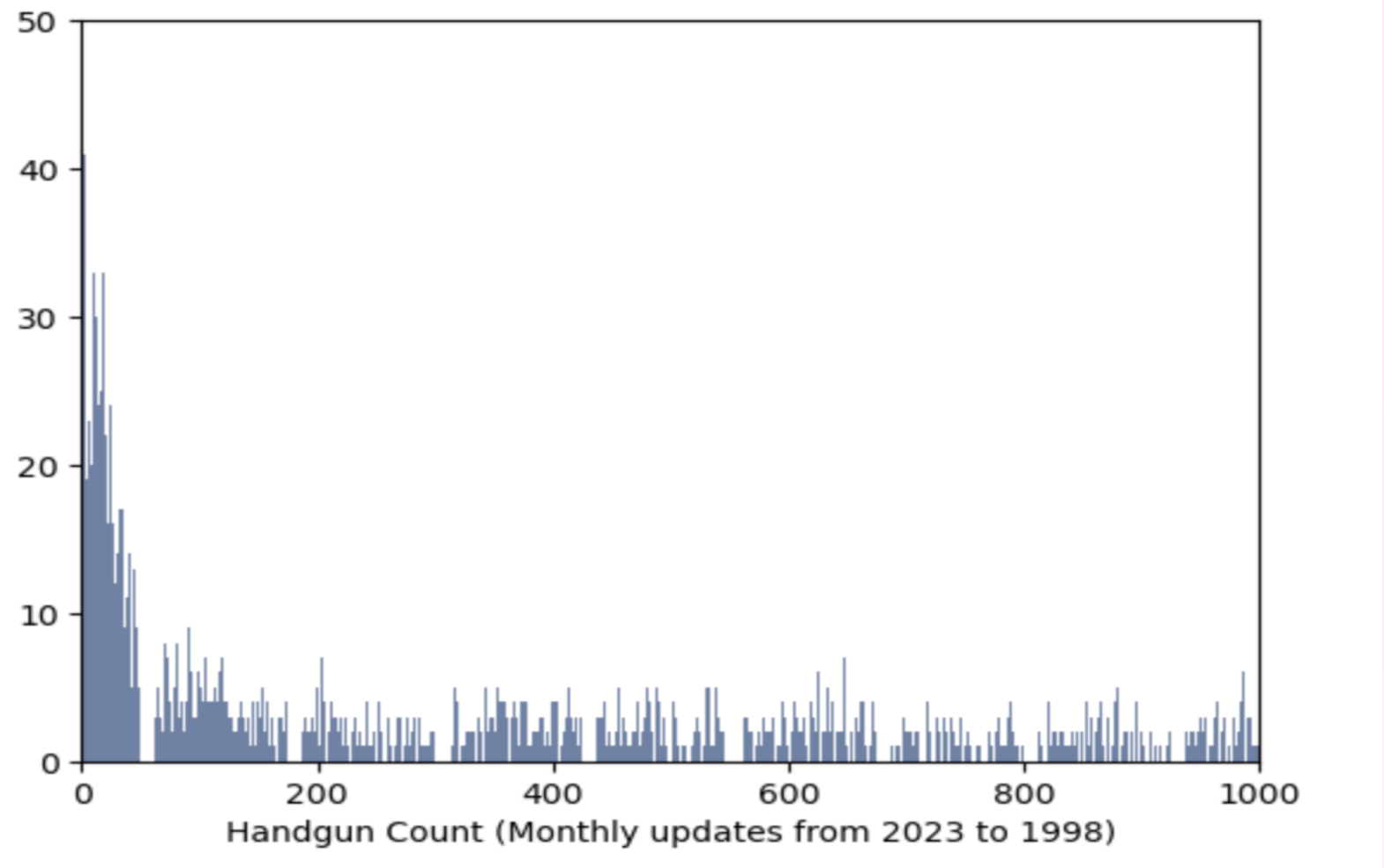


As the year gets closer to the present the larger the integer gets. There is a cluster by the beginning of the chart but the values start to spread out after the cluster. There are outliers around 2000 to 8000 that have an abnormal distance from other values, they would be replaced with the mean value and accounted for.

Handguns

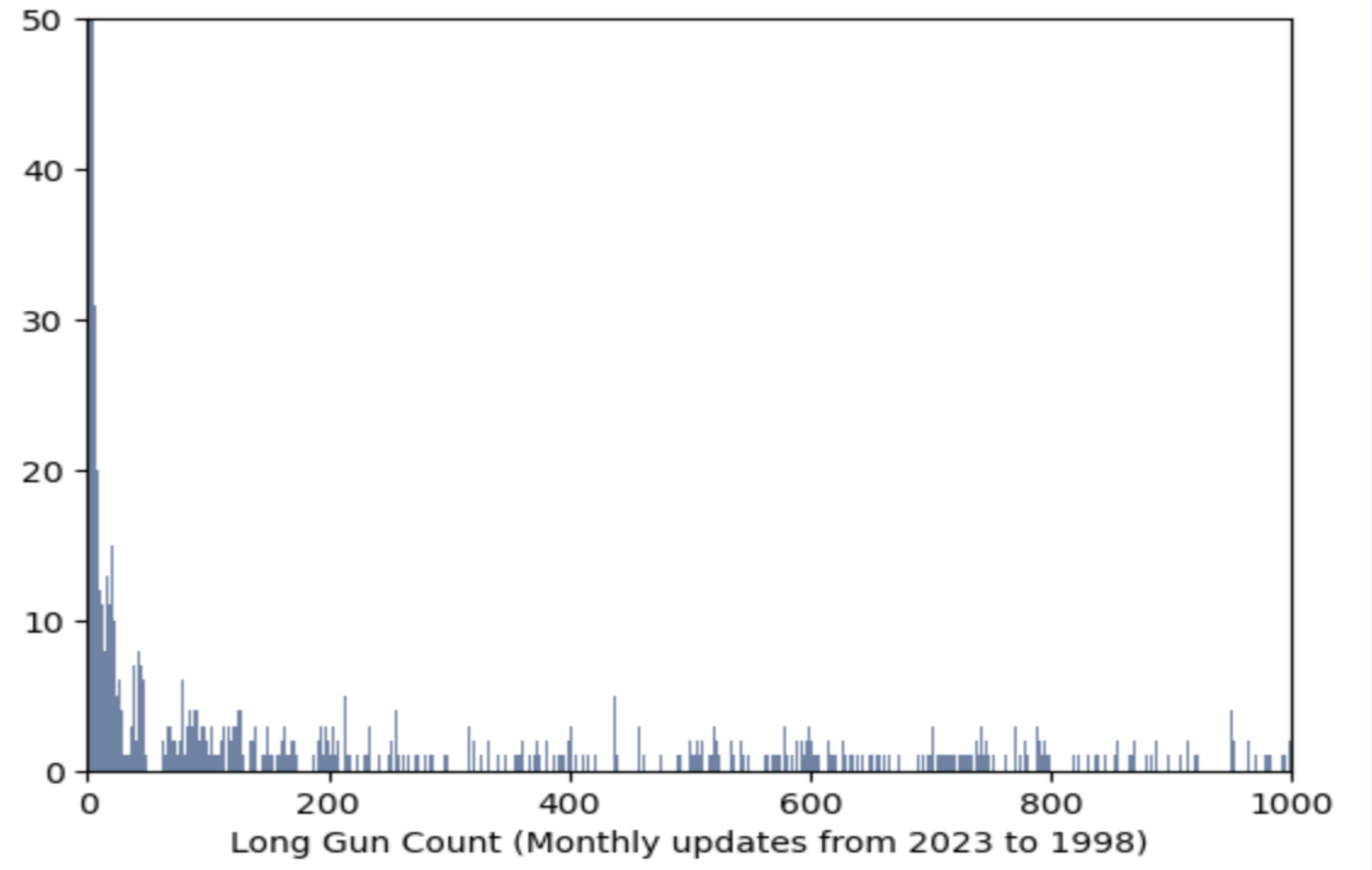
- Handgun is the integer of the cumulative count of the number of Handguns owned by civilians within the designated month and state.

- As the year gets closer to the present the larger the integer gets. There is a cluster by the beginning of the chart but the values start to spread and even out after the cluster. There are less outliers except for a few empty zeros within the data, which have an abnormal distance from other values



Long Guns

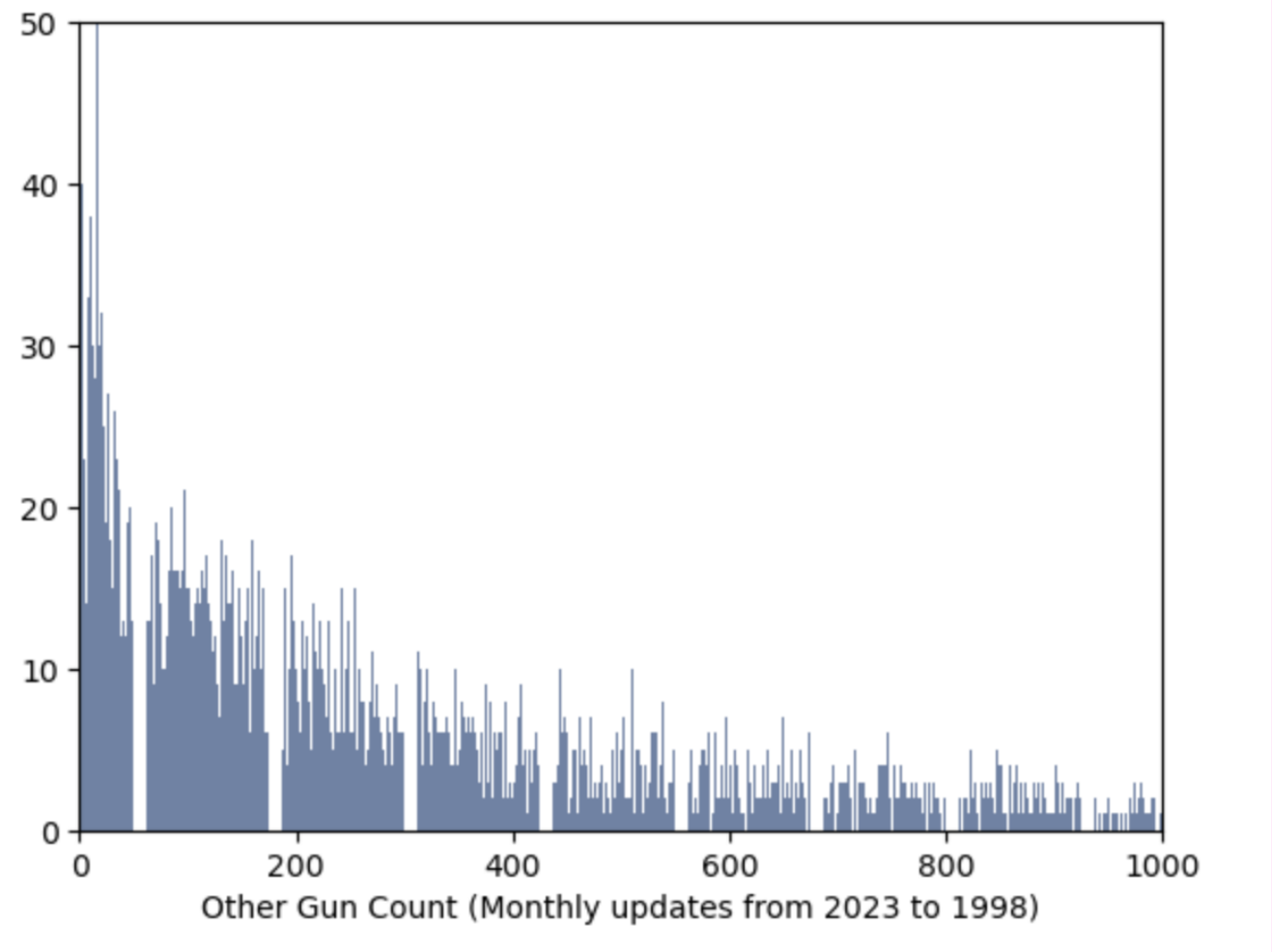
- Long gun is the integer of the cumulative count of the number of long guns owned by civilians within the designated month and state.



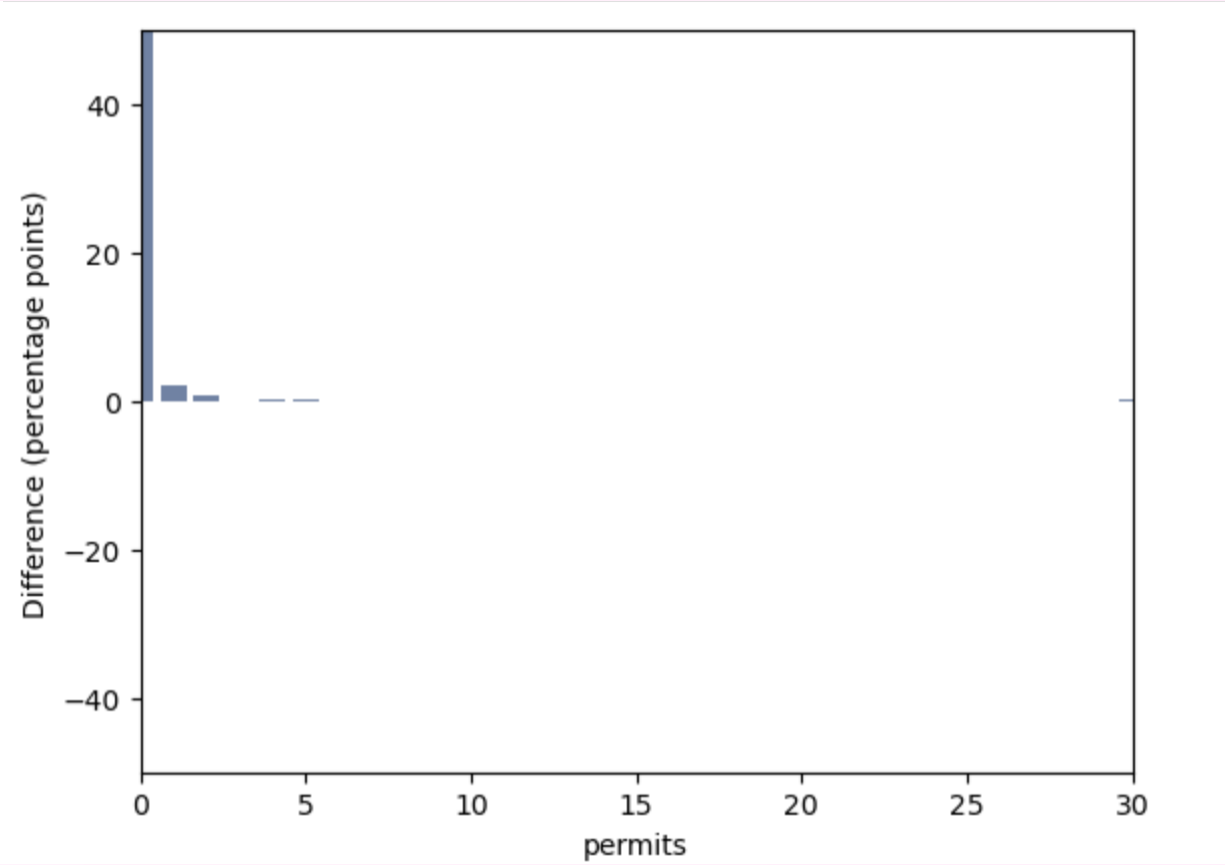
As the year gets closer to the present the larger the integer gets. There is a cluster by the beginning of the chart but the values start to spread and even out after the cluster, there are outliers such as a few empty zeros within the data. The outliers would be replaced with the mean value and accounted for.

Other Guns

- Other is the integer of the cumulative count of the number of other guns owned by civilians within the designated month and state.
- As the year gets closer to the present the larger the integer gets. There are clusters that gradually decrease, there are outliers such as obvious gaps within the data. This Variable has the greatest counts. The outliers would also be removed but accounted for.

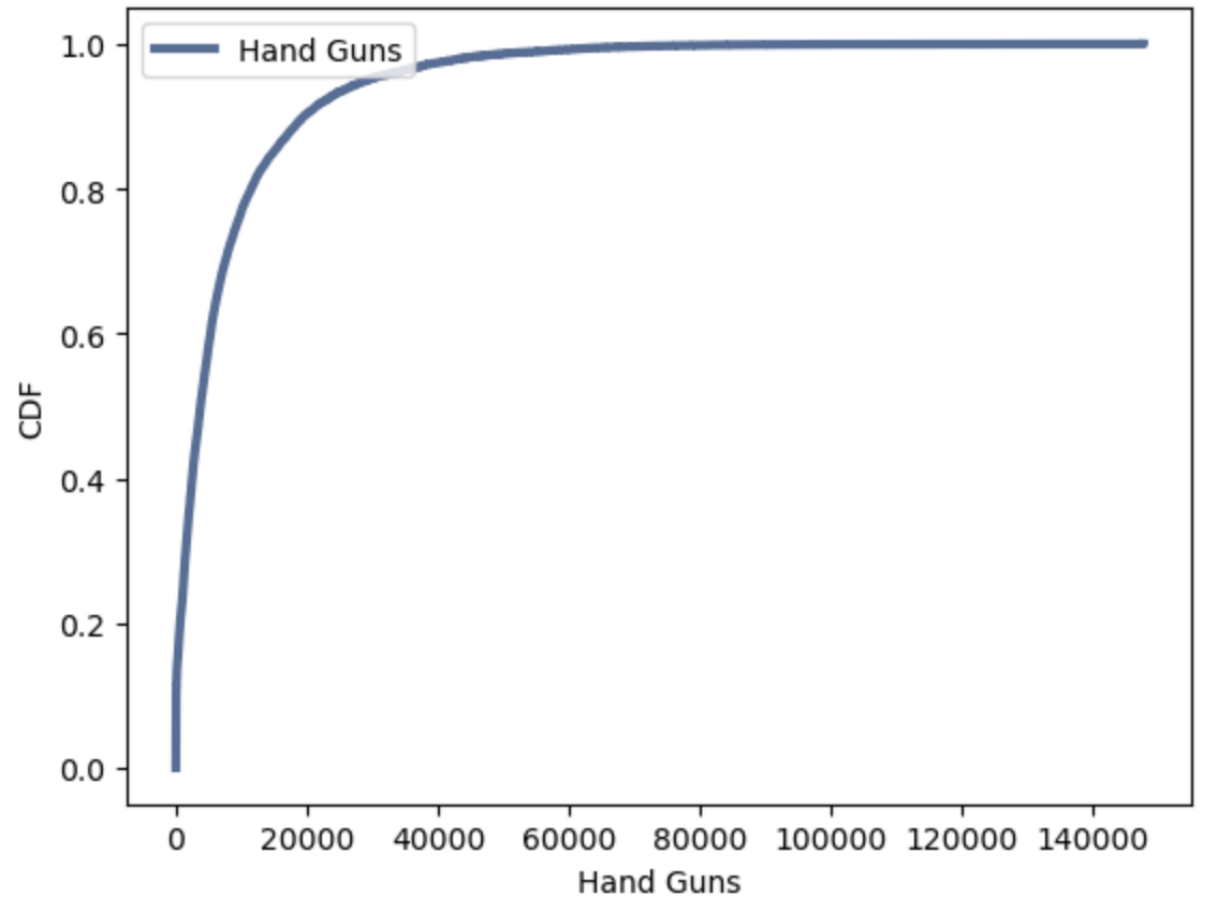


Pmf Comparison



- In my chart I am comparing the difference in permits within Florida and California. By using permit data for values that are located only in FL and Ca, thus filtering out all the other data.
- I would further investigate the difference, however, from the chart we can see the biggest difference from the first few permits and a small difference comes up around 30 which would be an outlier since it has an abnormal difference to the other values.

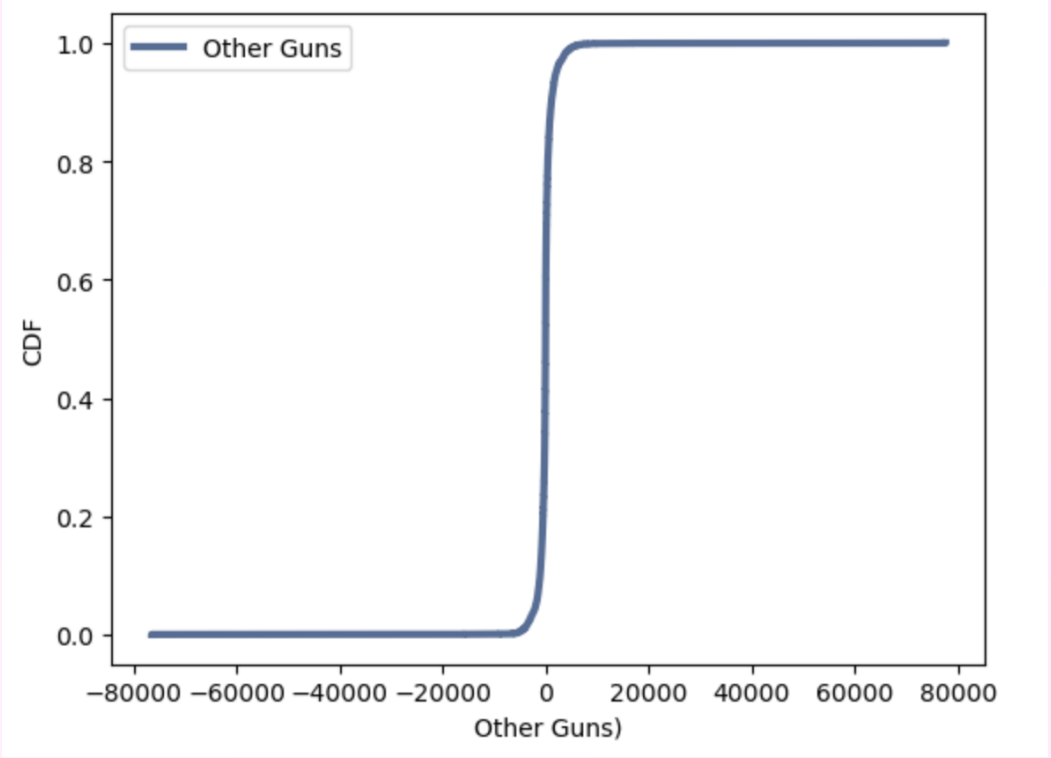
Cdf



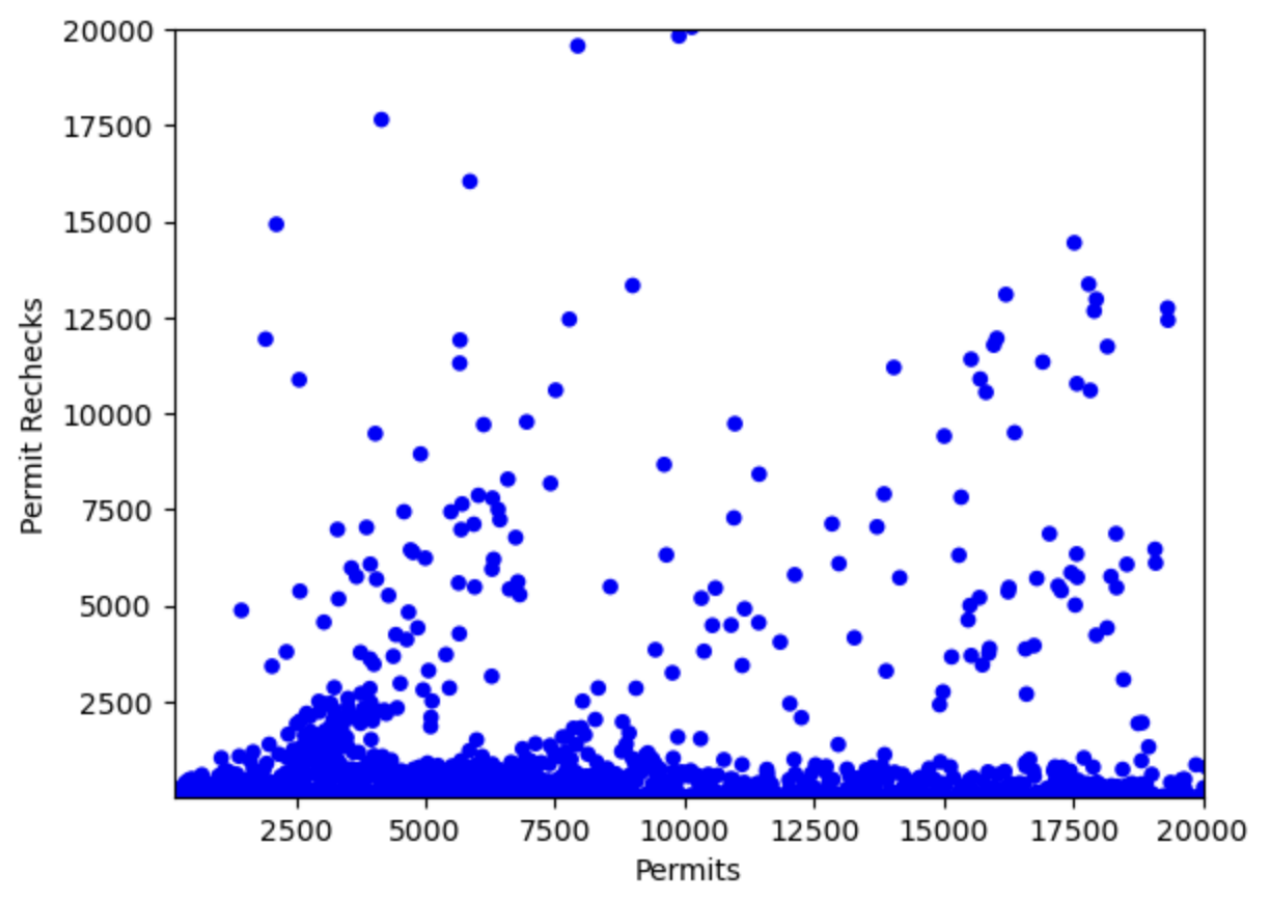
- This cumulative distribution function is regarding the handgun variable
- The curve of the graph has a huge spike in the beginning and then turns to a slight increase
- The data has most of its largest values at the beginning of the set, since 1998 the data has had small numbers up until I it gets closer to the present

Exponential Distribution

- The distribution shows a direct rise to 1 as the 'other guns' quantity crosses 0.
- The parameter, λ, is likely a larger whole positive number since the spike is so drastic.
- This exponential distribution works for this data set since this distribution type looks at interarrival times, we can see when other guns became popular among public citizens.



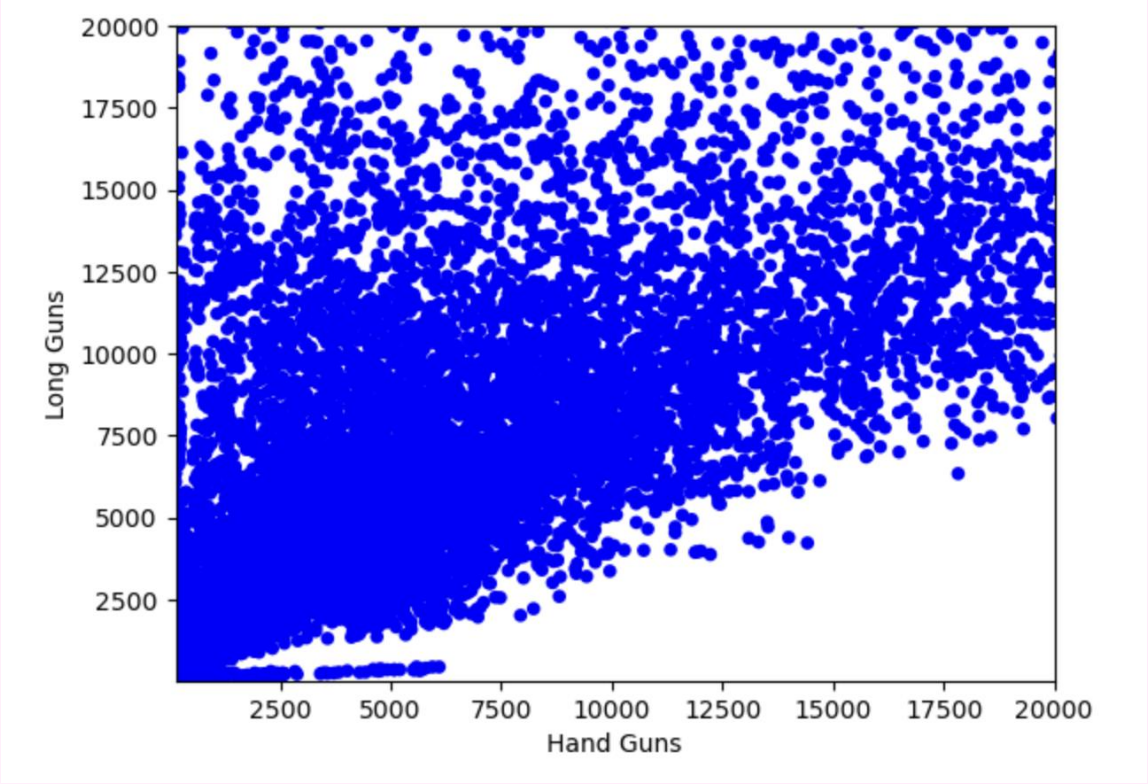
Scatterplot: Permits vs. Permit rechecks



- Permits have a higher quantity than permit rechecks giving their relationship weak
- The spearman correlation coefficient r is 0.27 which shows that it has a weak correlation that is positive.

Scatterplot: Handguns vs. Long guns

- Handguns and long guns seem to be very popular guns with a very scattered plots.
- The spearman correlation coefficient r is 0.76 which shows that it has a strong positive correlation



Hypothesis Testing

- Gun violence is a topic of discussion for most Americans, being aware of gun safety while owning a firearm is very reassuring to most civilians.
- The null hypothesis states that if there is a positive correlation between permits in a state and the number of handguns owned by the public.
- After performing a Pearson's correlation test, the result was a P value of 0. This means the effect of the other variable isn't strong and they are likely not affected by one another.

Multiple Regression Analysis

OLS Regression Results

Dep. Variable:	permit	**R-squared:**	0.653
Model:	OLS	**Adj. R-squared:**	0.652
Method:	Least Squares	**F-statistic:**	548.5
Date:	Sat, 03 Jun 2023	**Prob (F-statistic):**	6.47e-69
Time:	00:54:00	**Log-Likelihood:**	-2994.7
No. Observations:	293	**AIC:**	5993.
Df Residuals:	291	**BIC:**	6001.
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	-5357.2054	712.344	-7.521	0.000	-6759.205	-3955.206
handgun	0.4042	0.017	23.421	0.000	0.370	0.438

Omnibus:	38.266	**Durbin-Watson:**	0.391
Prob(Omnibus):	0.000	**Jarque-Bera (JB):**	141.702
Skew:	-0.469	**Prob(JB):**	1.70e-31
Kurtosis:	6.275	**Cond. No.**	7.55e+04

- This analysis is based off of permits as a function of handguns.
- R-squared is 0.65 signifying that 65% of the variations in permit values is accounted for by handguns.
- The data is also moderately, negatively skewed.

References

https://github.com/BuzzFeedNews/nics-firearm-background-checks/tree/master/data
Buzzfeed News. (2023). Nics Firearm background checks [Data set]. GitHub