How Many Cameras Are On You? An Analysis of the Location of Surveillance Devices in the US in Relation to Various Demographic Categories

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Abstract

Throughout this research paper, we utilize data from Atlas of Surveillance (AoS) and demographic data from the American Community Survey 5-year estimates to determine whether there exists a correlation between the number of surveillance technologies in a county and the demographics of its residents. We utilize Ordinary Least Squares Regression (OLS) and train a K-Nearest Neighbors (KNN) machine learning model in order to answer our research question. With some demographic groups we find statistically significant correlations using OLS, but no explanation for the variance between variables. We conclude by making several recommendations for future research in this area.

1. Introduction

AoS is a database containing the records of multiple surveillance technologies owned and operated by local law enforcement agencies. Some of the surveillance technologies included in this database are drones, body-worn cameras, automated license plate readers, facial recognition, within others [1]. The American Community Survey 5-year estimates is a database containing county-wide demographic information in different categories such as gender, race, income, etc.

Throughout this research paper, we utilize these two data sets to determine whether there exists a correlation between the number of surveillance technologies in a county and the demographics of its residents. In order to answer this question, we use two methods of evaluation: OLS Regression and training/testing a KNN model.

2. Related Work & Ethics

2.1 Related Work

There are multiple papers describing the increased use of surveillance technologies in the United States. For once, Rojas [5] wrote a report discussing how anyone with an Internet connection in Newark is able to access police surveillance cameras. Rojas emphasizes that the citizens of Newark have access to feeds of dozens of cameras in the public, and that citizens are encouraged to report anything suspicious. Rojas criticizes this program by making the observation that giving the public access to this information can rely on the heavily biased judgement of residents, leading to an increase in systemic racism and bias in the policing system.

In addition, Ghaffary [4] wrote about President Donald Trump's proposal to create a 'smart wall' containing multiple technologies across the border, ranging from drones and sensors to Artificial Intelligence technologies. Throughout his article, Ghaffary quotes Republican representative Hurd, who stated that because every mile of the border is different, there are different technologies that fit for different purposes. Ghaffary also mentions that the technologies introduced into the border bring about privacy concerns for American citizens, particularly those living near border zones. While there is no proof that law enforcement is utilizing these technologies outside of the border, Ghaffary says, there are multiple examples of times where law enforcement agencies used surveillance technologies beyond their intended use [4].

Taking this work into account and looking at its relationship with the AoS database, we believe that the database does not contain a representative number of technologies per city or county. For example, in the case of Rojas's article we made a query of the number of policing technologies reported by citizens of Newark. We noticed, however, that there are only 14 technologies reported by residents. This contradicts Rojas' argument on the high number of technologies in Newark, and might demonstrate that the AoS database is not complete.

Given the privacy concerns expressed in Ghaffary's paper on surveillance technologies affecting citizens living in border zones, we also queried the AoS database to test the number of surveillance technologies reported in all of the American cities bordering with the Mexican border. The findings can be seen in Figure 1.

These findings demonstrate that there are some cities near the border that have a higher number of surveillance technologies than others. While these numbers might still be low relative to all of the cameras and technologies throughout the border, they demonstrate the presence of technologies near the US/Mexico border. All of these queries can be seen in Figure 2.

Lastly, predictive policing has been prevalent in the media. For example, Sam Biddle discusses *Dataminr*, a Twitter affiliated company and their involvement in allowing law enforcement to have access to data in order to predict the location of George Floyd Protests. This is a clear representation of the increasing of surveillance technologies within the US and the impact that it has on its citizens [3].

City	State	# Tech
San Diego	California	12
Calexico	California	1
San Luis	Arizona	1
Yuma	Arizona	4
Naco	Arizona	0
Nogales	Arizona	1
Douglas	Arizona	0
Columbus	New Mexico	18
Sunland Prk.	New Mexico	1
El Paso	Texas	9
Edinburg	Texas	4
Socorro	Texas	2
San Elizario	Texas	0
Brownsville	Texas	6
Del Rio	Texas	2
Eagle Pass	Texas	2
Presidio	Texas	0
Hidalgo	Texas	1
Laredo	Texas	10
El Cenizo	Texas	0
Roma	Texas	0
Escobares	Texas	0
Rio Grande City	Texas	1
La Grulla	Texas	0
Progresso Lakes	Texas	0

Figure 1: *Number of surveillance technologies per city and state in AoS across cities in the US-Mexico border [2]*

2.2 Ethics

We recognize that attempting to measure the correlation of surveillance technologies and demographic characteristics might not be representative of the true impact that these technologies have on different members of underrepresented groups and minorities. The quality of our conclusions are dependent on the quality of the data sets used. Furthermore, we attempt to conduct unbiased research methods.

3. Methods

3.1 Data

```
SELECT COUNT(Technology) AS
NumberOfTechnologies
FROM Atlas_of_Surveillance_20201007
WHERE
City=Newark;

SELECT COUNT(Technology) AS
NumberOfTechnologies
FROM
Atlas_of_Surveillance_20201007
WHERE
City='San Diego';

SELECT COUNT(Technology)
AS NumberOfTechnologies
FROM Atlas_of_Surveillance_20201007
WHERE City='Progresso Lakes';
```

Figure 2: *Example of* `SQL| queries used to test number of surveillance technologies per city`

We use two data sets: AoS from the Electronic Frontier Foundation (EFF) and U.S. Census Demographic Data found on *Kaggle* which contains information from the American Community Survey 5-year estimates.

AoS contains a CSV file of 5,785 rows of data regarding surveillance devices throughout United States. The database contains multiple columns, the ones that we utilized were the following: *City, County, State, Agency*, and *Technology* (Gunshot Detection, Facial Recognition, etc) [2]. Over 500 students and volunteers compiled AoS from publicly available data sets. The census demographic data contains two CSV files from 2015 and 2017 with 3,221 rows each. From this database, we use the following columns: *State, County, TotalPop, Men, Women, Percent Hispanic, Percent White, Percent Black, Percent Native, Percent Asian, Percent Pacific, VotingAgeCitizen, Income, IncomeErr, IncomePerCap, IncomePerCapErr, Poverty, ChildPoverty, Professional, Service, Office, Construction, Production, Drive, Carpool, Transit, Walk, OtherTransport, WorkAtHome, MeanCommute, Employed, PrivateWork, PublicWork, SelfEmployed, FamilyWork*, and *Unemployed* [6].

We convert the CSV files from both data sets into SQL tables and place them all in the same database with 3 tables, which we name `atlas.db`. In order to clean up this database, we run SQL queries to convert all of the *County* names to the same format (i.e. we append "county" to the end of each county for uniformity). Second, we update the AoS *State* names such that for each state name it contains the two character state code instead of the full state names to match the U.S Census Demographic Data. Afterwards, we manually use the `sqlite3` command line interface in order to update these tables (Figure 3). Since each row of AoS represents one surveillance device, we are able to use this data set to count the number of devices per county. We choose not to remove outliers from our data sets given the context of what we are researching.

```
UPDATE Atlas_of_Surveillance_20201007 SET
State = "Wyoming" WHERE State == "WY";

UPDATE acs2017_county_data SET County =
County + ' County' WHERE NOT County LIKE
'%County%';

UPDATE acs2015_county_data SET County =
County + ' County' WHERE NOT County LIKE
'%County%';
```

Figure 3: *Example of SQL queries used to clean data sets*

3.2 Analysis Methods

We use the `statsmodels` module to run OLS regressions over different demographic categories from the county-wide data sets against the total number of surveillance devices used per county, and against different totals for each surveillance technology. We do this to see if there is a correlation between demographic categories and the number and type of surveillance devices.

Second, we use the `sklearn` and `numpy` modules in `python` in order to train a machine learning model using the k-nearest neighbors algorithm. We do this in order to see if we can draw a relationship between multiple features available in our county-demographic tables and the number of surveillance devices in a county. We use the following features from the 2015 county-demographic data set: *TotalPop, Poverty, Men, Women, Black, White, Native, Hispanic, Asian, Pacific, Income, Drive, Walk, Transit, Profesional, WorkAtHome, Unemployment, SelfEmployed, Professional, Employed* [6]. In order to label our data, we use `numpy`'s percentile function to divide the number of devices per county into quartiles *(25th, 50th, 75th, and 99th percentiles)* in order to decrease the volatility of our labels. We use 80% of our data for training the model and 20% for testing which we randomly select using `sklearn`'s `train_test_split` function. We automate the process of finding the optimal number of neighbors by looping through the possible options for neighbors within reason (from 1 neighbor to 250 neighbors) and selecting the best number based on the resulting accuracies.

4. Analysis

We analyze the results from our ordinary least squared regression tests and the KNN machine learning model.

4.1 Ordinary Least Squared Regression:

We run multiple tests comparing demographic groups against different total numbers of police surveillance technologies per county, but we focus on four significant results in this section based on 2015 demographic data. For more regression results, please see the appendix.

For each result, we include four values and the corresponding regression plot. The *R-squared* value describes the percentage of variance in the change of the dependent variable that can be explained by the independent variable. We list the the *p-value* for the independent variable which tests our null hypothesis. Finally, we list the regression parameters. We include the constant parameter b and the parameter m linked to the independent variable for the fitted regression line $y = mx + b$.

1. We compare the percentage of Black residents against the total sightings of policing technologies per county.

    - **R-squared value:** $R^2 = 0.005$
    - **P-value:** $p = 0.012$
    - **Regression parameters:**
        - $b = 3.8236$
        - $m = 0.0384$

    We notice that we have a low R^2 value, but a significant p value (our significance level is 0.05). This indicates that while there is a significant correlation between our two variables, changes in the percentage of the population that is Black can not explain the variability of the number of policing technologies well.

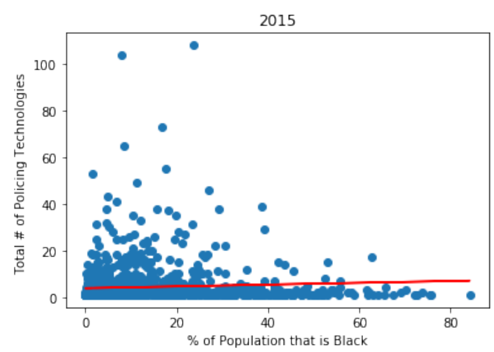

Figure 4: *OLS Regression results for Percentage of Population that is Black as the independent variable and Total number of Policing technologies as the dependent variable*

We see a slight positive correlation between our two variables indicating that the number of policing technologies grows slightly in counties with greater percentages of Black residents. However, the regression line does not well describe outliers and data which is skewed to the right. Note that we also have similar significant results for 2017 demographic data.

2. We compare the percentage of White residents against the total sightings of policing technologies per county.

    - **R-squared value:** $R^2 = 0.096$
    - **P-value:** $p = 0.000$
    - **Regression parameters:**
        - $b = 13.5607$
        - $m = -0.1258$

    Again, we notice a low R^2 value, but significant p value. This indicates that while there is a significant correlation between the two variables, changes in the percentage of the population that is White cannot explain the variability of the number of policing technologies well.

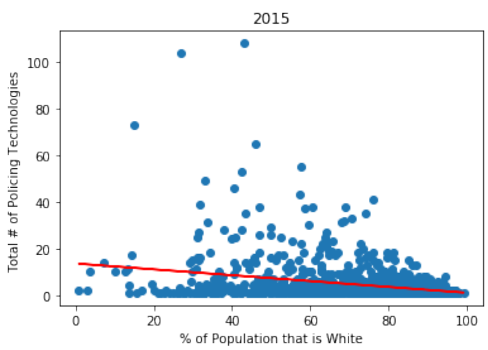

Figure 5: *OLS Regression results for Percentage of Population that is White as the independent variable and Total number of Policing technologies as the dependent variable*

Unlike our analysis on the percentage of Black residents against the total sightings of policing technologies per county where we found a positive correlation, we see a negative correlation between our two variables in this case. This indicates that the number of policing technologies diminishes in counties with greater percentages of White residents. Note that we also have similar significant results for 2017 demographic data.

3. We compare the percentage of Black residents against the total sightings of Ring technologies per county.

    - **R-squared value:** $R^2 = 0.014$
    - **P-value:** $p = 0.007$
    - **Regression parameters:**
        - $b = 2.3364$
        - $m = 0.0413$

We next looked at demographics against individual technologies. In this case, we look at the percentage of Black residents against the number of Ring technologies, the only case of positive correlation between percentage of Black residents against an individual technology. Here we have the same pattern of low R^2 value and significant p value indicating that while there is a significant correlation between the two variables, the variability is not well explained. It might be worth noting that looking at the percentage of White residents against the number of Ring technologies, there was a negative correlation.

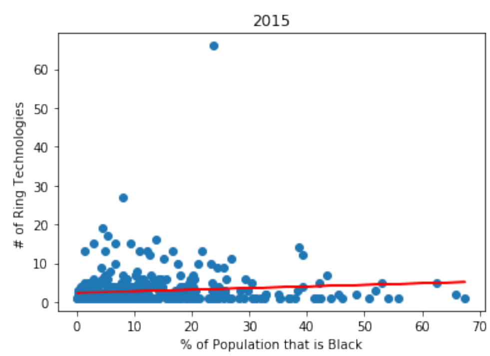

Figure 6: *OLS Regression results for Percentage of Population that is Black as the independent variable and Total number of Ring Policing technologies as the dependent variable*

We see a slight positive correlation between our variables indicating that the number of Ring technologies grows slightly in counties with greater percentages of Black residents.

4. We compare the percentage of White residents against the total sightings of facial recognition technologies per county.

    - **R-squared value:** $R^2 = 0.049$

- **P-value:** $p = 0.012$
- **Regression parameters:**
  - $b = 5.8946$
  - $m = -0.0493$

In this case, we look at the percentage of White residents against the number of facial recognition technologies. Here we have the same pattern of low R^2 value and significant p value indicating that while there is a significant correlation between the two variables, the variability is not well explained. It might be worth noting that looking at the percentage of Black residents against the number of facial recognition technologies, there was no significant correlation.

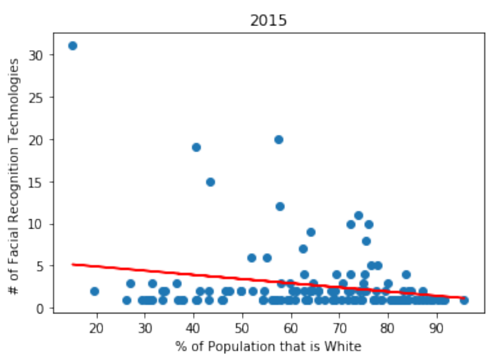

Figure 7: *OLS Regression results for Percentage of Population that is White as the independent variable and Total number of Ring Policing technologies as the dependent variable*

We see a slight negative correlation between our variables indicating that the number of facial recognition technologies diminishes slightly in counties with greater percentages of White residents.

Additional Results: The following tests also had statistically significant results.

- Percentage of the population that is Asian vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population that is Hispanic vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population that is Native vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population living in poverty vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population that drives vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population that is employed vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Percentage of the population that is self-employed vs. total number of policing technologies for both 2015 and 2017 demographic data.
- Average income per capita vs. total number of policing technologies for both 2015 and 2017 demographic data.

4.2 K-Nearest Neighbors Machine Learning Model:

After determining the optimal number of neighbors (121), our model is able to predict with about 60% accuracy which quartile a county will fall in when given its features: *Percent Black, Percent White, Percent Native, Percent Hispanic, Percent Asian, Percent Pacific, TotalPop, Poverty, Men, Women, Income, Driving to Work, Walking to Work, Taking Transit to Work, Professional Jobs, Work at Home, Unemployed, Self-Employed*, and *Employed in 2015*. Because we are working with quartiles, purely guessing a category would yield 25% accuracy, whereas our model predicted with over double that accuracy. This shows that our model was able to pick up on patterns within the features.

Limitations:

As mentioned in the Related Works section, we identify that there are limitations of our data set. We must keep in mind these limitations of our analysis. The AoS data set is sparse (from 2006-2020) and based on citizen observations which are unreliable and may not cover the true distribution of surveillance technology. We also note that the AoS website acknowledges the limitations.

5. Conclusions & Implications

In conclusion, analyzing the AoS and U.S. Census Demographic Data through OLS regressions and the KNN model allowed us to gain some insight on the correlations between AoS technologies and demographic data. While technically there are some significant findings, we believe that our results are not representative of reality due to the limitations of the database. We also believe that our results might not be representative because of the variability of the data and the fact that we did not consider the possibility of pursuing a multiple regression that took into account multiple variables at the same time.

We want to reiterate that we do not believe that these results are representative of the effects that surveillance technologies have on the members of the American community.

6. Future Work

Looking at our results, we find the potential of taking our work one step further by looking into the relationship between the AoS data, U.S. Census Data, and other relevant metrics. Some of the branches of investigation that we consider are:

- **Crime Rate:** We could consider the addition of the crime rate metric for each county and determine whether there exists a correlation between a county's crime rate and the number of surveillance technologies reported.
- **Predictive Policing:** We could analyze which of the technologies reported in the AoS database are also utilized for predictive policing. This could give us insight on whether there is a relationship between the technologies used for predictive policing and the technologies reported by citizens for the database.
- **Relationship to County's Income:** We also consider the idea of analyzing the number and type of surveillance technologies of a given county in comparison to the county's income. Since a county's funding comes mostly from taxes [7], it would be interesting to determine whether these two elements are related as well as the impact that taxes may have on surveillance.
- **Another Database for Surveillance Technologies:** One of the biggest limitations we face in this research was that the years in the AoS database were highly sparse (from 2006-2020), and not that close to the 2015 and 2017 U.S. Census Database; therefore, future work might seek to find a database that is more representative of those two years which could lead to more accurate and insightful results. Additionally, we consider limiting the AoS database to come closer to the 2015 and 2017 years, but we decide against it given that it would limit the amount of information to create a significant finding.
- **Consider political leaning:** It would be interesting to consider the relationship between the number and types of surveillance technologies along with the political beliefs shared with the majority of the county. For once, it would be interesting to continue this project next year and analyze the results of the 2020 elections and compare that data with AoS information.
- **Multiple Regression:** As mentioned in our conclusion, we believe that pursuing a Multiple Regression model could lead to greater insights into the data sets.

6. Try It Out Yourself!

We created a command-line script where people are able to enter information from a hypothetical county to see in which percentile of number of surveillance technologies their county would fall into. The repository can be accessed from this link, and the instructions are in the Description section.

7. Appendix

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.037
Model:                            OLS   Adj. R-squared:                  0.036
Method:                 Least Squares   F-statistic:                     49.11
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           3.90e-12
Time:                        17:04:10   Log-Likelihood:                -4439.3
No. Observations:                1288   AIC:                             8883.
Df Residuals:                    1286   BIC:                             8893.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         24.4783      2.898      8.446      0.000      18.793      30.164
x1            -0.2516      0.036     -7.008      0.000      -0.322      -0.181
==============================================================================
Omnibus:                     1534.100   Durbin-Watson:                   1.687
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           180886.267
Skew:                           6.053   Prob(JB):                         0.00
Kurtosis:                      59.780   Cond. No.                     1.10e+03
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.1e+03. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 8: *OLS Regression results for amount of individuals that drive to work as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                 -0.000
Method:                 Least Squares   F-statistic:                    0.7197
Date:                Tue, 20 Oct 2020   Prob (F-statistic):              0.396
Time:                        16:53:48   Log-Likelihood:                -4463.1
No. Observations:                1288   AIC:                             8930.
Df Residuals:                    1286   BIC:                             8941.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.1920      0.219     19.142      0.000       3.762       4.622
x1             0.3259      0.384      0.848      0.396      -0.428       1.080
==============================================================================
Omnibus:                     1575.942   Durbin-Watson:                   1.611
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           200963.679
Skew:                           6.330   Prob(JB):                         0.00
Kurtosis:                      62.870   Cond. No.                         1.80
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 9: *OLS Regression results for percentage of the population that is Pacific as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.091
Model:                            OLS   Adj. R-squared:                  0.090
Method:                 Least Squares   F-statistic:                     129.1
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           1.44e-28
Time:                        17:01:55   Log-Likelihood:                -4401.9
No. Observations:                1288   AIC:                             8808.
Df Residuals:                    1286   BIC:                             8818.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         -6.9006      1.001     -6.897      0.000      -8.864      -4.938
x1             0.3434      0.030     11.361      0.000       0.284       0.403
==============================================================================
Omnibus:                     1616.083   Durbin-Watson:                   1.701
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           247450.683
Skew:                           6.550   Prob(JB):                         0.00
Kurtosis:                      69.628   Cond. No.                         161.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 10: *OLS Regression results for percentage of the population that is working as professional as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.169
Model:                            OLS   Adj. R-squared:                  0.168
Method:                 Least Squares   F-statistic:                     261.5
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           1.10e-53
Time:                        16:52:56   Log-Likelihood:                -4344.3
No. Observations:                1288   AIC:                             8693.
Df Residuals:                    1286   BIC:                             8703.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.3359      0.229     10.209      0.000       1.887       2.785
x1             0.9136      0.056     16.171      0.000       0.803       1.024
==============================================================================
Omnibus:                     1539.831   Durbin-Watson:                   1.790
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           233237.455
Skew:                           5.976   Prob(JB):                         0.00
Kurtosis:                      67.832   Cond. No.                         4.79
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 11: *OLS Regression results for percentage of the population that is Asian as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.005
Model:                            OLS   Adj. R-squared:                  0.004
Method:                 Least Squares   F-statistic:                     6.355
Date:                Tue, 20 Oct 2020   Prob (F-statistic):             0.0118
Time:                        16:03:49   Log-Likelihood:                -4460.3
No. Observations:                1288   AIC:                             8925.
Df Residuals:                    1286   BIC:                             8935.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          3.8236      0.267     14.296      0.000       3.299       4.348
x1             0.0384      0.015      2.521      0.012       0.009       0.068
==============================================================================
Omnibus:                     1574.453   Durbin-Watson:                   1.606
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           200846.286
Skew:                           6.319   Prob(JB):                         0.00
Kurtosis:                      62.856   Cond. No.                         21.8
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 12: *OLS Regression results for percentage of the population that is Black as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.627
Model:                            OLS   Adj. R-squared:                  0.626
Method:                 Least Squares   F-statistic:                     2158.
Date:                Tue, 20 Oct 2020   Prob (F-statistic):          2.29e-277
Time:                        16:57:41   Log-Likelihood:                -3829.1
No. Observations:                1288   AIC:                             7662.
Df Residuals:                    1286   BIC:                             7672.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.6053      0.143     11.191      0.000       1.324       1.887
x1          2.729e-05   5.88e-07     46.454      0.000    2.61e-05    2.84e-05
==============================================================================
Omnibus:                      916.646   Durbin-Watson:                   1.890
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            64745.534
Skew:                           2.601   Prob(JB):                         0.00
Kurtosis:                      37.342   Cond. No.                     2.66e+05
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 2.66e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 13: *OLS Regression results for percentage of the population that is employed as the independent variable and total number of Policing technologies as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.021
Model:                            OLS   Adj. R-squared:                  0.014
Method:                 Least Squares   F-statistic:                     2.789
Date:                Wed, 21 Oct 2020   Prob (F-statistic):             0.0974
Time:                        22:15:58   Log-Likelihood:                -362.17
No. Observations:                 129   AIC:                             728.3
Df Residuals:                     127   BIC:                             734.1
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.0422      0.547      3.733      0.000       0.960       3.125
x1             0.0551      0.033      1.670      0.097      -0.010       0.120
==============================================================================
Omnibus:                      144.453   Durbin-Watson:                   1.831
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             2724.803
Skew:                           4.130   Prob(JB):                         0.00
Kurtosis:                      23.945   Cond. No.                         25.6
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 14: *OLS Regression results for percentage of the population that is Black as the independent variable and total number of Policing technologies which are facial recognition as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.015
Model:                            OLS   Adj. R-squared:                  0.007
Method:                 Least Squares   F-statistic:                     1.945
Date:                Wed, 21 Oct 2020   Prob (F-statistic):              0.166
Time:                        22:13:29   Log-Likelihood:                -362.59
No. Observations:                 129   AIC:                             729.2
Df Residuals:                     127   BIC:                             734.9
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.2467      1.126      1.107      0.270      -0.982       3.475
x1             0.0972      0.070      1.395      0.166      -0.041       0.235
==============================================================================
Omnibus:                      144.629   Durbin-Watson:                   1.914
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             2653.938
Skew:                           4.156   Prob(JB):                         0.00
Kurtosis:                      23.607   Cond. No.                         51.2
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 15: *OLS Regression results for percentage of the population that are living in Poverty as the independent variable and total number of Policing technologies which are facial recognition as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.013
Model:                            OLS   Adj. R-squared:                 -0.003
Method:                 Least Squares   F-statistic:                    0.7991
Date:                Wed, 21 Oct 2020   Prob (F-statistic):              0.375
Time:                        22:18:57   Log-Likelihood:                -71.494
No. Observations:                  62   AIC:                             147.0
Df Residuals:                      60   BIC:                             151.2
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.5251      0.168      9.054      0.000       1.188       1.862
x1            -0.0071      0.008     -0.894      0.375      -0.023       0.009
==============================================================================
Omnibus:                       38.122   Durbin-Watson:                   1.954
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               83.196
Skew:                           2.078   Prob(JB):                     8.59e-19
Kurtosis:                       6.865   Cond. No.                         36.2
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 16: *OLS Regression results for percentage of the population that are Black as the independent variable and total number of Policing technologies which are gunshot detection as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.022
Model:                            OLS   Adj. R-squared:                  0.006
Method:                 Least Squares   F-statistic:                     1.381
Date:                Wed, 21 Oct 2020   Prob (F-statistic):              0.245
Time:                        22:19:46   Log-Likelihood:                -71.198
No. Observations:                  62   AIC:                             146.4
Df Residuals:                      60   BIC:                             150.7
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.8029      0.354      5.092      0.000       1.095       2.511
x1            -0.0256      0.022     -1.175      0.245      -0.069       0.018
==============================================================================
Omnibus:                       36.782   Durbin-Watson:                   1.887
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               77.369
Skew:                           2.020   Prob(JB):                     1.58e-17
Kurtosis:                       6.692   Cond. No.                         58.7
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 17: *OLS Regression results for percentage of the population that are living in poverty as the independent variable and total number of Policing technologies which are gunshot detection as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.042
Model:                            OLS   Adj. R-squared:                  0.026
Method:                 Least Squares   F-statistic:                     2.616
Date:                Wed, 21 Oct 2020   Prob (F-statistic):              0.111
Time:                        22:17:58   Log-Likelihood:                -70.581
No. Observations:                  62   AIC:                             145.2
Df Residuals:                      60   BIC:                             149.4
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.9671      0.362      5.434      0.000       1.243       2.691
x1            -0.0097      0.006     -1.617      0.111      -0.022       0.002
==============================================================================
Omnibus:                       37.954   Durbin-Watson:                   1.964
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               82.937
Skew:                           2.064   Prob(JB):                     9.78e-19
Kurtosis:                       6.882   Cond. No.                         224.
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 18: *OLS Regression results for percentage of the population that is White as the independent variable and total number of Policing technologies which are gunshot detection as the dependent variable in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.070
Model:                            OLS   Adj. R-squared:                  0.070
Method:                 Least Squares   F-statistic:                     97.43
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           3.35e-22
Time:                        16:50:26   Log-Likelihood:                -4416.4
No. Observations:                1288   AIC:                             8837.
Df Residuals:                    1286   BIC:                             8847.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.6858      0.260     10.331      0.000       2.176       3.196
x1             0.1523      0.015      9.871      0.000       0.122       0.183
==============================================================================
Omnibus:                     1531.798   Durbin-Watson:                   1.720
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           186499.844
Skew:                           6.021   Prob(JB):                         0.00
Kurtosis:                      60.707   Cond. No.                         21.1
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 19: *OLS Regression results for percentage of the population that is Hispanic as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.097
Model:                            OLS   Adj. R-squared:                  0.096
Method:                 Least Squares   F-statistic:                     137.6
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           2.97e-30
Time:                        16:55:57   Log-Likelihood:                -4398.0
No. Observations:                1288   AIC:                             8800.
Df Residuals:                    1286   BIC:                             8810.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         -5.5876      0.861     -6.487      0.000      -7.277      -3.898
x1             0.0004   3.26e-05     11.728      0.000       0.000       0.000
==============================================================================
Omnibus:                     1615.976   Durbin-Watson:                   1.685
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           250431.666
Skew:                           6.543   Prob(JB):                         0.00
Kurtosis:                      70.046   Cond. No.                     1.11e+05
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.11e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 20: *OLS Regression results for income per capita as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.005
Model:                            OLS   Adj. R-squared:                  0.004
Method:                 Least Squares   F-statistic:                     5.866
Date:                Tue, 20 Oct 2020   Prob (F-statistic):             0.0156
Time:                        16:51:21   Log-Likelihood:                -4460.5
No. Observations:                1288   AIC:                             8925.
Df Residuals:                    1286   BIC:                             8935.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.3722      0.224     19.524      0.000       3.933       4.812
x1            -0.1509      0.062     -2.422      0.016      -0.273      -0.029
==============================================================================
Omnibus:                     1576.564   Durbin-Watson:                   1.607
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           201892.020
Skew:                           6.333   Prob(JB):                         0.00
Kurtosis:                      63.013   Cond. No.                         3.76
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 21: *OLS Regression results for percentage of the population that is Native as the independent variable and total number of Policing technologiesin 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.010
Model:                            OLS   Adj. R-squared:                  0.010
Method:                 Least Squares   F-statistic:                     13.57
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           0.000240
Time:                        16:53:13   Log-Likelihood:                -4456.7
No. Observations:                1288   AIC:                             8917.
Df Residuals:                    1286   BIC:                             8928.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          6.3591      0.618     10.286      0.000       5.146       7.572
x1            -0.1320      0.036     -3.683      0.000      -0.202      -0.062
==============================================================================
Omnibus:                     1586.166   Durbin-Watson:                   1.619
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           210084.089
Skew:                           6.390   Prob(JB):                         0.00
Kurtosis:                      64.248   Cond. No.                         49.8
==============================================================================
```

Figure 22: *OLS Regression results for percentage of the population that is living in Poverty as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.014
Model:                            OLS   Adj. R-squared:                  0.013
Method:                 Least Squares   F-statistic:                     17.62
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           2.88e-05
Time:                        16:59:54   Log-Likelihood:                -4454.7
No. Observations:                1288   AIC:                             8913.
Df Residuals:                    1286   BIC:                             8924.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          6.6799      0.623     10.720      0.000       5.457       7.902
x1            -0.3753      0.089     -4.198      0.000      -0.551      -0.200
==============================================================================
Omnibus:                     1594.448   Durbin-Watson:                   1.623
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           214411.125
Skew:                           6.446   Prob(JB):                         0.00
Kurtosis:                      64.879   Cond. No.                         20.6
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 23: *OLS Regression results for percentage of the population that is living self employed as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                 -0.000
Method:                 Least Squares   F-statistic:                    0.8469
Date:                Tue, 20 Oct 2020   Prob (F-statistic):              0.358
Time:                        17:03:11   Log-Likelihood:                -4463.1
No. Observations:                1288   AIC:                             8930.
Df Residuals:                    1286   BIC:                             8940.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.4898      0.361     12.442      0.000       3.782       5.198
x1            -0.1083      0.118     -0.920      0.358      -0.339       0.123
==============================================================================
Omnibus:                     1577.957   Durbin-Watson:                   1.606
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           202485.780
Skew:                           6.343   Prob(JB):                         0.00
Kurtosis:                      63.101   Cond. No.                         5.49
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 24: *OLS Regression results for percentage of the population that walk to work as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.096
Model:                            OLS   Adj. R-squared:                  0.095
Method:                 Least Squares   F-statistic:                     136.5
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           4.92e-30
Time:                        16:48:36   Log-Likelihood:                -4398.5
No. Observations:                1288   AIC:                             8801.
Df Residuals:                    1286   BIC:                             8811.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         13.5607      0.825     16.432      0.000      11.942      15.180
x1            -0.1258      0.011    -11.681      0.000      -0.147      -0.105
==============================================================================
Omnibus:                     1526.494   Durbin-Watson:                   1.716
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           189308.465
Skew:                           5.973   Prob(JB):                         0.00
Kurtosis:                      61.179   Cond. No.                         308.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 25: *OLS Regression results for percentage of the population that is White as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.007
Model:                            OLS   Adj. R-squared:                  0.006
Method:                 Least Squares   F-statistic:                     9.291
Date:                Tue, 20 Oct 2020   Prob (F-statistic):            0.00235
Time:                        17:00:45   Log-Likelihood:                -4458.8
No. Observations:                1288   AIC:                             8922.
Df Residuals:                    1286   BIC:                             8932.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.8056      0.513      5.474      0.000       1.800       3.811
x1             0.3440      0.113      3.048      0.002       0.123       0.565
==============================================================================
Omnibus:                     1574.849   Durbin-Watson:                   1.622
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           202018.823
Skew:                           6.319   Prob(JB):                         0.00
Kurtosis:                      63.038   Cond. No.                         11.3
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 26: *OLS Regression results for percentage of the population that work from home as the independent variable and total number of Policing technologies in 2015*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.171
Model:                            OLS   Adj. R-squared:                  0.170
Method:                 Least Squares   F-statistic:                     264.5
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           3.16e-54
Time:                        17:21:25   Log-Likelihood:                -4343.0
No. Observations:                1288   AIC:                             8690.
Df Residuals:                    1286   BIC:                             8700.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.3041      0.229     10.049      0.000       1.854       2.754
x1             0.8896      0.055     16.263      0.000       0.782       0.997
==============================================================================
Omnibus:                     1544.335   Durbin-Watson:                   1.790
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           235190.597
Skew:                           6.007   Prob(JB):                         0.00
Kurtosis:                      68.101   Cond. No.                         4.97
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 27: *OLS Regression results for percentage of the population that are Asian as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.005
Model:                            OLS   Adj. R-squared:                  0.004
Method:                 Least Squares   F-statistic:                     6.303
Date:                Tue, 20 Oct 2020   Prob (F-statistic):             0.0122
Time:                        17:22:40   Log-Likelihood:                -4460.3
No. Observations:                1288   AIC:                             8925.
Df Residuals:                    1286   BIC:                             8935.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          3.8252      0.267     14.301      0.000       3.300       4.350
x1             0.0381      0.015      2.511      0.012       0.008       0.068
==============================================================================
Omnibus:                     1574.706   Durbin-Watson:                   1.606
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           201004.392
Skew:                           6.320   Prob(JB):                         0.00
Kurtosis:                      62.880   Cond. No.                         21.9
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 28: *OLS Regression results for percentage of the population that are Black as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.626
Model:                            OLS   Adj. R-squared:                  0.625
Method:                 Least Squares   F-statistic:                     2149.
Date:                Tue, 20 Oct 2020   Prob (F-statistic):          1.14e-276
Time:                        17:09:41   Log-Likelihood:                -3830.7
No. Observations:                1288   AIC:                             7665.
Df Residuals:                    1286   BIC:                             7676.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          1.6191      0.144     11.281      0.000       1.338       1.901
x1          2.619e-05   5.65e-07     46.362      0.000    2.51e-05    2.73e-05
==============================================================================
Omnibus:                      918.241   Durbin-Watson:                   1.890
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            64892.817
Skew:                           2.608   Prob(JB):                         0.00
Kurtosis:                      37.380   Cond. No.                     2.76e+05
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 2.76e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 29: *OLS Regression results for percentage of the population that are Employed as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.071
Model:                            OLS   Adj. R-squared:                  0.071
Method:                 Least Squares   F-statistic:                     98.88
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           1.70e-22
Time:                        17:23:51   Log-Likelihood:                -4415.8
No. Observations:                1288   AIC:                             8836.
Df Residuals:                    1286   BIC:                             8846.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.6489      0.261     10.133      0.000       2.136       3.162
x1             0.1514      0.015      9.944      0.000       0.122       0.181
==============================================================================
Omnibus:                     1532.480   Durbin-Watson:                   1.724
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           187114.732
Skew:                           6.024   Prob(JB):                         0.00
Kurtosis:                      60.805   Cond. No.                         21.6
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 30: *OLS Regression results for percentage of the population that are Hispanic as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.076
Model:                            OLS   Adj. R-squared:                  0.075
Method:                 Least Squares   F-statistic:                     105.4
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           8.09e-24
Time:                        17:20:01   Log-Likelihood:                -4412.8
No. Observations:                1288   AIC:                             8830.
Df Residuals:                    1286   BIC:                             8840.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         -3.4464      0.775     -4.445      0.000      -4.968      -1.925
x1             0.0001    1.4e-05     10.266      0.000       0.000       0.000
==============================================================================
Omnibus:                     1610.687   Durbin-Watson:                   1.688
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           242008.919
Skew:                           6.517   Prob(JB):                         0.00
Kurtosis:                      68.876   Cond. No.                     2.07e+05
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 2.07e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 31: *OLS Regression results for the average income as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.099
Model:                            OLS   Adj. R-squared:                  0.099
Method:                 Least Squares   F-statistic:                     142.0
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           4.02e-31
Time:                        17:19:15   Log-Likelihood:                -4396.0
No. Observations:                1288   AIC:                             8796.
Df Residuals:                    1286   BIC:                             8806.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         -5.6344      0.852     -6.610      0.000      -7.307      -3.962
x1             0.0004      3e-05     11.915      0.000       0.000       0.000
==============================================================================
Omnibus:                     1615.635   Durbin-Watson:                   1.686
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           250513.325
Skew:                           6.540   Prob(JB):                         0.00
Kurtosis:                      70.059   Cond. No.                     1.18e+05
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.18e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 32: *OLS Regression results for the income per capita as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.005
Model:                            OLS   Adj. R-squared:                  0.004
Method:                 Least Squares   F-statistic:                     6.102
Date:                Tue, 20 Oct 2020   Prob (F-statistic):             0.0136
Time:                        17:22:02   Log-Likelihood:                -4460.4
No. Observations:                1288   AIC:                             8925.
Df Residuals:                    1286   BIC:                             8935.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.3733      0.224     19.549      0.000       3.934       4.812
x1            -0.1495      0.061     -2.470      0.014      -0.268      -0.031
==============================================================================
Omnibus:                     1576.654   Durbin-Watson:                   1.608
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           201983.014
Skew:                           6.334   Prob(JB):                         0.00
Kurtosis:                      63.027   Cond. No.                         3.86
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 33: *OLS Regression results for the percentage that is Native as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.000
Model:                            OLS   Adj. R-squared:                 -0.000
Method:                 Least Squares   F-statistic:                    0.5430
Date:                Tue, 20 Oct 2020   Prob (F-statistic):              0.461
Time:                        17:20:45   Log-Likelihood:                -4463.2
No. Observations:                1288   AIC:                             8930.
Df Residuals:                    1286   BIC:                             8941.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.1950      0.219     19.132      0.000       3.765       4.625
x1             0.2803      0.380      0.737      0.461      -0.466       1.026
==============================================================================
Omnibus:                     1575.924   Durbin-Watson:                   1.611
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           200911.304
Skew:                           6.330   Prob(JB):                         0.00
Kurtosis:                      62.861   Cond. No.                         1.79
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 34: *OLS Regression results for the percentage that is Pacific as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.013
Model:                            OLS   Adj. R-squared:                  0.012
Method:                 Least Squares   F-statistic:                     16.31
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           5.69e-05
Time:                        17:18:39   Log-Likelihood:                -4455.4
No. Observations:                1288   AIC:                             8915.
Df Residuals:                    1286   BIC:                             8925.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          6.5159      0.607     10.739      0.000       5.326       7.706
x1            -0.1490      0.037     -4.039      0.000      -0.221      -0.077
==============================================================================
Omnibus:                     1586.838   Durbin-Watson:                   1.620
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           210935.573
Skew:                           6.393   Prob(JB):                         0.00
Kurtosis:                      64.376   Cond. No.                         46.7
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 35: *OLS Regression results for the percentage that is living in poverty as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.090
Model:                            OLS   Adj. R-squared:                  0.089
Method:                 Least Squares   F-statistic:                     127.0
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           3.68e-28
Time:                        17:17:53   Log-Likelihood:                -4402.8
No. Observations:                1288   AIC:                             8810.
Df Residuals:                    1286   BIC:                             8820.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         -6.7644      0.997     -6.788      0.000      -8.719      -4.809
x1             0.3327      0.030     11.270      0.000       0.275       0.391
==============================================================================
Omnibus:                     1615.816   Durbin-Watson:                   1.694
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           246633.929
Skew:                           6.550   Prob(JB):                         0.00
Kurtosis:                      69.514   Cond. No.                         163.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 36: *OLS Regression results for the percentage that is working a professional job as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.011
Model:                            OLS   Adj. R-squared:                  0.011
Method:                 Least Squares   F-statistic:                     14.79
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           0.000126
Time:                        17:09:02   Log-Likelihood:                -4456.1
No. Observations:                1288   AIC:                             8916.
Df Residuals:                    1286   BIC:                             8927.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          6.4651      0.621     10.408      0.000       5.246       7.684
x1            -0.3495      0.091     -3.845      0.000      -0.528      -0.171
==============================================================================
Omnibus:                     1592.878   Durbin-Watson:                   1.622
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           213185.575
Skew:                           6.437   Prob(JB):                         0.00
Kurtosis:                      64.698   Cond. No.                         20.2
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 37: *OLS Regression results for the percentage that is working self employed job as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                 -0.000
Method:                 Least Squares   F-statistic:                    0.7491
Date:                Tue, 20 Oct 2020   Prob (F-statistic):              0.387
Time:                        17:17:13   Log-Likelihood:                -4463.1
No. Observations:                1288   AIC:                             8930.
Df Residuals:                    1286   BIC:                             8941.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          4.4702      0.357     12.508      0.000       3.769       5.171
x1            -0.1028      0.119     -0.865      0.387      -0.336       0.130
==============================================================================
Omnibus:                     1577.852   Durbin-Watson:                   1.605
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           202390.287
Skew:                           6.342   Prob(JB):                         0.00
Kurtosis:                      63.086   Cond. No.                         5.34
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 38: *OLS Regression results for the percentage that walk to work as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.098
Model:                            OLS   Adj. R-squared:                  0.097
Method:                 Least Squares   F-statistic:                     139.4
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           1.30e-30
Time:                        17:23:15   Log-Likelihood:                -4397.2
No. Observations:                1288   AIC:                             8798.
Df Residuals:                    1286   BIC:                             8809.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         13.4830      0.811     16.632      0.000      11.893      15.073
x1            -0.1257      0.011    -11.806      0.000      -0.147      -0.105
==============================================================================
Omnibus:                     1527.764   Durbin-Watson:                   1.720
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           190616.042
Skew:                           5.979   Prob(JB):                         0.00
Kurtosis:                      61.385   Cond. No.                         301.
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 39: *OLS Regression results for the percentage that is white the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.045
Model:                            OLS   Adj. R-squared:                  0.044
Method:                 Least Squares   F-statistic:                     60.67
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           1.38e-14
Time:                        17:07:07   Log-Likelihood:                -4433.8
No. Observations:                1288   AIC:                             8872.
Df Residuals:                    1286   BIC:                             8882.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         26.6025      2.881      9.235      0.000      20.951      32.254
x1            -0.2770      0.036     -7.789      0.000      -0.347      -0.207
==============================================================================
Omnibus:                     1530.580   Durbin-Watson:                   1.703
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           180827.017
Skew:                           6.026   Prob(JB):                         0.00
Kurtosis:                      59.782   Cond. No.                     1.11e+03
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.11e+03. This might indicate that there are
strong multicollinearity or other numerical problems.
```

Figure 40: *OLS Regression results for the percentage that drive to work as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                  0.000
Method:                 Least Squares   F-statistic:                     1.281
Date:                Tue, 20 Oct 2020   Prob (F-statistic):              0.258
Time:                        17:08:04   Log-Likelihood:                -4462.8
No. Observations:                1288   AIC:                             8930.
Df Residuals:                    1286   BIC:                             8940.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          3.5493      0.634      5.601      0.000       2.306       4.793
x1             0.1029      0.091      1.132      0.258      -0.075       0.281
==============================================================================
Omnibus:                     1572.948   Durbin-Watson:                   1.613
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           199010.866
Skew:                           6.311   Prob(JB):                         0.00
Kurtosis:                      62.573   Cond. No.                         20.8
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 41: *OLS Regression results for the percentage that is unemployed as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.011
Model:                            OLS   Adj. R-squared:                  0.010
Method:                 Least Squares   F-statistic:                     13.80
Date:                Tue, 20 Oct 2020   Prob (F-statistic):           0.000212
Time:                        17:10:17   Log-Likelihood:                -4456.6
No. Observations:                1288   AIC:                             8917.
Df Residuals:                    1286   BIC:                             8928.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          2.4867      0.515      4.833      0.000       1.477       3.496
x1             0.3993      0.107      3.715      0.000       0.188       0.610
==============================================================================
Omnibus:                     1575.452   Durbin-Watson:                   1.626
Prob(Omnibus):                  0.000   Jarque-Bera (JB):           203275.233
Skew:                           6.321   Prob(JB):                         0.00
Kurtosis:                      63.232   Cond. No.                         11.9
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 42: *OLS Regression results for the percentage that works from home as the independent variable and total number of Policing technologies in 2017*

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      y   R-squared:                       0.049
Model:                            OLS   Adj. R-squared:                  0.041
Method:                 Least Squares   F-statistic:                     6.521
Date:                Wed, 21 Oct 2020   Prob (F-statistic):             0.0118
Time:                        22:17:08   Log-Likelihood:                -360.34
No. Observations:                 129   AIC:                             724.7
Df Residuals:                     127   BIC:                             730.4
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          5.8946      1.286      4.585      0.000       3.351       8.439
x1            -0.0493      0.019     -2.554      0.012      -0.088      -0.011
==============================================================================
Omnibus:                      130.404   Durbin-Watson:                   1.723
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             1797.032
Skew:                           3.673   Prob(JB):                         0.00
Kurtosis:                      19.745   Cond. No.                         244.
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
```

Figure 43: *OLS Regression results for the percentage that are White as the independent variable and total number of Policing technologies that were facial recognition in 2015*

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