SYSTEM CHECKING EFFECT OF UNEMPLOYMENT AND POPULATION ON CRIME IN INDIA

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ABSTRACT

In this paper, we analyze the relationship between unemployment, crime and Population. Here we use Indian data to estimate the effect of population on unemployment and crime rate. The aim of this study is to investigate consistency in identifying unemployment and crime rate of some popular region using previous year data of that region. According to the theory of economics of crime, increased unemployment rates lead to higher property crime rates. A fixed-effects model is estimated to investigate this hypothesis. A controlled experiment on a data of 10 years was performed to investigate whether the methods for unemployment or crime identification, known from the literature, provide similar results. In addition, a qualitative analysis of the experiment data was performed to investigate whether it shows potential results or not. The ANOVA test was perform to find the relationship between population and unemployment and crime rate. If the value of PR is greater than F then there is a considerable difference between two values are not similar. And if PR is less than F than there is no much difference between two values. In analysis of crime and population, or in crime and unemployment in both cases PR is less than F that means there is a relationship. The results show that unemployment had a positive and significant effect on some property crimes (burglary, car theft and bike theft).

Keywords: PR, F (Variation Between Sample Means / Variation Within The Samples).

I.   INTRODUCTION

In 2013, the unemployment rate is on the peak from last 10 years. Moreover between 2000 – 2018 our population is continuously increasing, according to a report in this period crime rate is also increasing. That shows that unemployment and crime are concurrently occurring, as India population is increasing rapidly which will affect employment, and if peoples are unemployed then they try to earn money by wrong way which increase in crime. To the extent that increased the legitimate employment opportunities deter potential offenders from committing crimes, a decline in the unemployment rate such as that observed during the 1990s may be said to cause the declines in crime rates. Studies of crime rates generally find small and statistically weak unemployment effect, whereas several studies also find that unemployment also cause some serious crimes like murder.

The crime rate (crime incidence per 100,000 of population) in India increased from 383.5 in 2018 and 385.5 in 2019 to 383.8 in 2020 according to the National Crime Records Bureau. Moreover an additional problem associated with interpreting the empirical relationship between population and crime or between crime and unemployment concerns the direction of causation. To the extent that criminal activity reduces the employability of offenders, and crime level may itself impede employment growth and increases regional unemployment levels.

In this Paper we estimate the effect of unemployment and crime or population and crime using data of period 2008 – 2018. Here we do Comparative study of crime, population and unemployment will be done using ANOVA method to identify that, Is there any relation between crime and population or crime and unemployment?

First we collect the data from a trustable source and then perform the ANOVA method on the data by which, we can keep a check on crime rate in country if the unemployment and population growth is increasing or decreasing.

The results of ANOVA method shows that the crime, population and unemployment are very much related to each other.

II.   LITERATURE REVIEW

Trends of crimes in India is keep fluctuating as the population is increasing and also with the rapid development of new towns and cities. The rise in crimes is increasing worstly as the unemployment increases

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which is worrying factor for the Indian Government. In India, the crime data is maintained by NCRB(National Crime Records Bureau)[1].Crime is an illegal event which affects the harmony of humanity. The one who victimized in a crime, is affected both physically and mentally. That is the memory of crime is haunted him throughout the life. Due to increasing population it is not possible to use traditional data collection and analysis method for accurate estimation of crime and unemployment effect, here we use some advance methods to analysis the previous records[2]. This is very much important to do a analysis between unemployment and crime or population and unemployment to make a country developed and to remove loop holes available that occurring the situation[3]. Although we sees that all the crime catogries are progressively increasing over past 40 years of study period, with the exception of unregistered crimes. In order to overcome this problem, we use the index line graphs in which relation between crime and unemployment is shown[4]. Increases unemployment and population will affect the crime rates as per the previous studies been conducted, as unemployment leads to increases the level of inequality and poverty within the society, because to this unstability in the society more crime are occurred and hence crime rate increases[5]. Various researchs conducted before has documented the correlation between crime, unemployment and population. In theory, the unemployed peoples due to different reasons commit crimes and in turn perpetrate more of them[6]. Unemployment and poverty are paradox to each other as if a person is employed has a good life to live, but a person who is unemployed, have nothing to survive in life can generally do crime to make himself stable in the society[7].

III. METHODOLOGY

This part will introduce our approach to estimate the effect of unemployment and population on crime rate. We will start by collecting the data from various trustable sources and converted them into .csv file which is acceptable by our coding language. We first use OLS regression to estimate the effect of population on crime and then for unemployment on crime rate, Then we applied ANOVA test on the selected data to find a relationship between unemployment and crime, or population and crime.

Effect of Unemployment and population on crime

This activity involves various steps:

• Collect the data of Unemployment ratio, population and crime rate of previous years

• Arrange them in a sequence.

Data

Crime Rate-Per 100K Population(M1)	India Population(M2)	Unemployment Rate (%)(M3)	Year
3.83	1200669765	5.36	2008
3.76	1217726215	5.61	2009
3.76	1234281170	5.65	2010
3.81	1250287943	5.65	2011
3.75	1265780247	5.66	2012
3.58	1280842125	5.67	2013
3.66	1295600772	5.6	2014
3.39	1310152403	5.56	2015
3.22	1324517249	5.51	2016
3.12	1338676785	5.41	2017
3.08	1352642280	5.33	2018

• Use crime rate as M1, Population as M2, unemployment as M3.

	M1	M2	M3
0	3.83	1200669765	5.36
1	3.76	1217726215	5.61
2	3.76	1234281170	5.65
3	3.81	1250287943	5.65
4	3.75	1265780247	5.66

- Create a CSV to store the data.
- Here we use different package such as pandas, matplotlib, statsmodels.
- Define a variable in which we read our input file.
- First apply OLS function on any two columns such as on M1 and M2.
- Then apply ANOVA test on the result of OLS.
- Now again use OLS on M1 and M3, and then apply ANOVA test again.
- Again apply it for M2 and M3, and similarly use ANOVA again.

|	df	sum_sq	mean_sq	F	PR(>F)	
M2	1	0.698714	0.698714	49.10947	0.000063	
Residual	9	0.128049	0.014228	NaN	NaN	
	df	sum_sq	mean_sq	F	PR(>F)	
M3	1	0.284998	0.284998	4.734478	0.057559	
Residual	9	0.541766	0.060196	NaN	NaN	
	df	sum_sq	mean_sq	F	F	PR(>F)
M3	1	3.23E+15	3.23E+15	1.32E+00	1.321931	0.27988
Residual	9	2.20E+16	2.44E+15	NaN	NaN	NaN

Relation Estimation

We are finding the relationship between or population and crime using regression and Anova test in python.
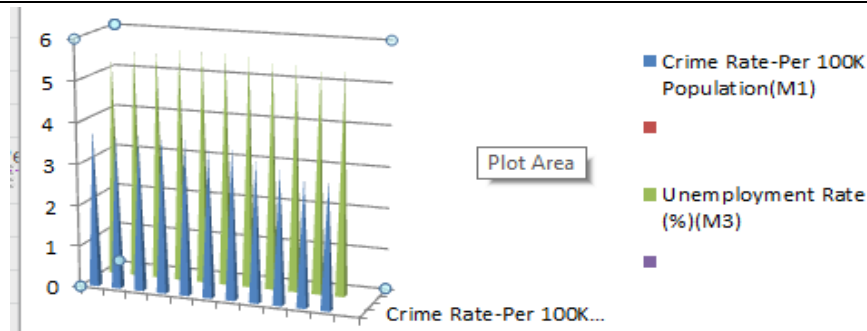
In ANOVA test, If value of PR is greater than F then there is a considereble difference between two values- Two values are not similar.

If value of PR is less than F then there is no much difference between two values-Two values are similar.

- Unemployment and crime rate relationship graph from 1991-2007.
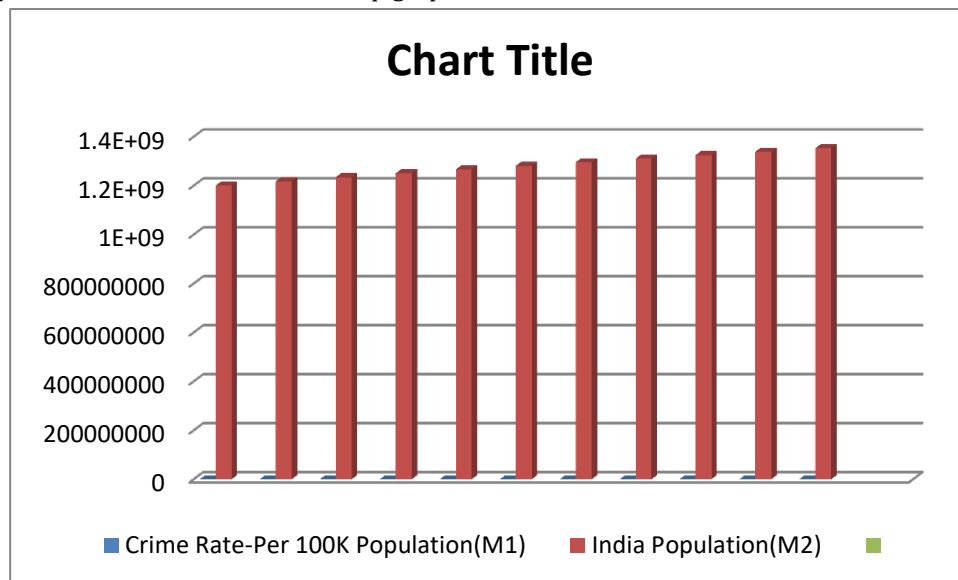
- Unemployment and crime rate relationship graph from 2008-2018.

IV.   CONCLUSION

This paper states a system which is used for the checking of effect of population and unemployment on crime rate. The suggested approach to do so is make a data file which contains records of previous years unemployment ratios and crime rates, using advance python package such as pandas, statsmodels and regression techniques and OLS (Ordinary Least Squares) method, these method are applied on three sequential components that is crime rate, population and unemployment ratio and generates a relationship between these.

In addition, this is also helpful in analysis a region where more crimes are occurring in coming time, and can be prevented using some advance preventions like spreading more police force in that area, or by controlling unemployment ratio of that particular region. To analyze this method, it is tested on two different datasets and final results are validates the accuracy of more than 95% and this system very reliable and is available 99.99%.

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