

ECONOMICS OF CRIME

TOPIC

What is the nature and extent of relationship between the economic and social factors and crime rate in India?

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INTRODUCTION

For any nation, crime is one of the most important social issues and interest in public safety has only grown stronger in recent years.

The existing literature shows that several factors, social and economic, have an effect on the crime rates, such as unemployment rate, inflation rate, etc.

Since such factors have an effect on the crime rate, these factors can be used in order to control and reduce crime rate. For this purpose, it is essential to understand the nature and the extent of the relationship between crime rates and these variables. While several factors have been identified which are responsible for the trend in crime rates but there is no consensus on the actual causes of crimes. However, it is generally accepted that crimes have caused different implications relating to economic and social costs to the society.

Economic models, not only predict and explain the behaviour of criminals, but can also be used to describe the causes of crime and the dynamic interaction between criminals and anti-crime measures.

LITERATURE REVIEW

Initial theories of crime emphasized on the effect of poverty and social deprivation on crime rates (Shaw and McKay, 1942, Cloward and Ohlin, 1960). Fleisher (1966) talks about the role income plays in committing of crimes by people. He argued that

crime rates are positively associated with unemployment and low income levels. His study stresses that low income and low expected cost of committing crimes leads to an increase in the inclination of committing crimes. Furthermore, the legal lifetime earnings are viewed as very less by low income people and they assume to lose comparatively small earnings if they have a criminal record, the opportunity cost of time spent in jail is low.

However, Gary Becker viewed criminals not as poverty stricken oppressed groups but as rational economic agents. Like any other person he said a potential criminal weighs the costs/risks and benefits when deciding whether or not to commit a crime. He, however, wrote that "some individuals become criminals because of the financial and other rewards from crime compared to legal work, taking account of the likelihood of apprehension and conviction, and the severity of punishment."

Among the other issues examined some important ones were the effects of police presence, convictions, and the severity of punishment on the level of criminal activity (Becker, 1968, Ehrlich, 1973, 1975, 1996). This led to the development of deterrence theory which argues that potential criminals evaluate both the risk of being caught and the punishment associated. This is confirmed that both factors have a negative effect on crime rates through the empirical evidence obtained from developed countries.

Similarly, Ehrlich (1973) models the participation of individuals in non-market, legal and illegal activities, and predicts an unspecified effect of crime on economic development. Moreover, it finds that inequalities increase the level of crime and the probability of trepidation discourages the crime.

Fajnzylber, Lederman and Loayza (2000) conducted cross country comparisons and have found that across countries crime rate differentials are linked to growth and poverty and, to some extent, by demographic factors.

Tang and Lean (2007) tried to determine the effect of inflation and unemployment on crimes in Malaysian economy for the period 1970-2006. Their study concludes that inflation and unemployment have positive and significant impact on crimes in Malaysia.

Dutta and Husain (2009) investigated the determinants of crimes in India using state level data set for the period 1999-2005. The study considered urbanization, poverty, education, load on police force, economic growthC impact on crimes in India.

DATA METHODOLOGY

We employ quantitative research analysis to study our variables and conduct hypothesis testing for the purpose of finding out the significance of each of the variables in our model. First the crime rate trend is analysed. We use multi regression analysis model which is a set of statistical processes for estimating the relationships among other variables. We then assume hypotheses and proceed with the regression analysis, finding out whether the hypotheses assumed are correct or not. This study uses data of unemployment rate, conviction rate, income inequalities (gini), poverty and education index for the years 1990 to 2016 for India extracted from government of India's websites like National Crime Records Bureau, Open Government Data, National Sample Survey and United Nations Development Programme, etc.

THEORETICAL FRAMEWORK

One of the most important underlying assumptions used in economics is that of the rational behaviour. Economists extend this assumption to criminal studies also, as we have done in this paper. Criminals, are treated as rational agents, that participate in criminal behaviour in order to enhance their utility and respond to psychological and economic incentives. In other words, it is assumed that a rational criminal weighs the costs and benefits of committing a crime, and commit the crime only if the benefits exceed the costs. Hence, if it were too costly to commit a crime, less crimes would be committed.

Rational crime analysis does not require that all criminals are rational, as long as some of the criminals do take into account the expected punishment they will face. Individuals who commit spontaneous crimes of passion, or individuals who are intoxicated, or individuals who are poorly informed about the expected punishment may not adequately weigh in the costs and benefits of committing a crime. There also may be they face and possibly grossly underestimate it. There may even be individuals who, perversely, do not consider the expected punishment to be a cost. For example, in some violent street gangs, "serving time" may be considered a badge of honor, or part of an initiation process. It is easy to imagine that many criminals may not respond to changes in the expected punishment.

But if some criminals do take into account the consequences, a social policy can affect crime rate by affecting components that make up expected punishment. In making of such a social policy, there are two fundamental issues, the first involves identifying all the relevant trade-offs, and the second involves weighing the importance of each trade-off.

Becker considers crime to be a type of work, i.e., an activity that takes time and yields economic

benefits. The theoretical model is foremost applicable to property crime. In this model, we consider an individual n 's choice. He can either work to earn an income or commit a crime for the same income.

Let,

W - the individual's wage from honest work

$W(b)$ - Return from committing a crime

A - unemployment benefits

u - the unemployment rate

p - the probability that he/she is caught

S - the cost of punishment.

$c(n)$ - Psychological cost of committing a crime

The individual chooses crime if the expected return from crime minus psychological cost of committing a crime is higher than the expected return from work, i.e., if the following is fulfilled -

$$E(W(b)) - c(n) > E(W) \quad (1)$$

$E(W(b))$ can further be broken down into probability of not getting caught and expected benefit plus probability of getting caught and the cost of punishment, written as follows-

$$E(W(b)) = (1 - p)W(b) + pS \quad (2)$$

The expected return from work is affected by the unemployment the unemployment benefit. The unemployment rate affects the possibilities of becoming employed and, hence, also the expected $E(W)$. If the individual is employed during the period, he/she W , while if unemployed, he/she receives the unemployment benefits. This can be written as follows-

$$E(W) = (1 - u)W + uA. \quad (3)$$

The restriction in equation (1) for individual n written as:

$$c(n) < ((1 - p)(W(b) + p(S)) - ((1 - u)W + uA)), \quad (4)$$

i.e., the psychological cost of committing a crime should be strictly less than the difference in expected return from crime and expected return from honest work. Equation (4) hence states that an individual chooses crime as long as the expected income premium of choosing crime instead of honest work is above the individual-specific threshold value, $c(n)$.

Social policy, thus here can intervene in by affecting $c(n)$. Psychological cost, i.e., $c(n)$, further can depend on several factors such as conviction rates, total police strength, unemployment rate, inequality level in society, inflation rate and so on.

In our paper we use the model stated below to find the relation between crime rates and other given variables.

Crime = f (Conviction rates, Unemployment, Inflation, Inequality, Education, Total Police Strength)

In the above model both pure economic and socioeconomic determinants of crimes have been considered.

Why should Unemployment increase Crime?

The rational choice model of crime predicts that an individual chooses to commit crime when the expected net gain from crime is greater than that from staying out of crime. If one cannot find a well-paying job in the legitimate labor market, he may be more inclined to look for a job in the "criminal industry". This crime-as-an-alternative-job explanation works the best for financially motivated crimes, but it can be applied to other types of crime as well. If you already have a well-paying and respectable job, you have more to lose when committing a crime and may think twice before actually carrying out the crime. This reasoning

suggests that crime should fall during economic booms (when more well-paying legitimate jobs are available), and increase during recessions.

One of the fundamental principles of rational crime analysis is that the rational criminal's choice to commit crime reveals a preference toward illegal activities over legal ones, such as choosing to enter the legitimate labor market. This principle lends itself well to a simple prediction: in periods of high unemployment, the crime rate will be higher than in periods of low unemployment.

How are Income inequalities and Crime related ?

Certain crimes are motivated by economic considerations. According to Kelley (2000), "In the economic theory of crime, areas of high inequality place poor individuals who have low returns from market activity next to high-income individuals who have goods worth taking, thereby increasing the returns to time allocated to criminal activity" and such motivations may be created by a sense of frustration, or an "envy effect". Worsening income gaps can have adverse impact on genuine and legal income generating opportunities and thereby carries with itself the possibility of rise in crime. A growing body of evidence has also demonstrated that economic inequality is associated with a range of health and social problems, such as mental illness and violent crime. This is true across both rich and poor countries. Inequality hurts everyone. The division of resources, as well as wealth, is very uneven in India. This disparity creates different poverty ratios for different states.

On the one hand, some theories suggest that inequality generates a sense of injustice among disadvantaged people, which leads them to seek compensation by other means, including criminal activity. On the other hand, crime can be explained by a cost-benefit analysis: when the poorest citizens have few economic opportunities and there are greater income gaps between rich and poor, the economic benefits of crimes such as robberies or kidnappings – which often end in homicide – tend to be greater.

Why would Inflation increase Crime ?

Long and Witte documented that crime rate increases as inflation rate rises because hard times motivate criminal behaviours and inflation inhibits the capacity of communities to deter crime. Inflation causes the purchasing power to reduce and cost of living to increase. As a result crime rate may increase because an individual is unable to maintain his/her standard of living as before. When prices are rising fast, the demand for black-market goods goes up, which increases the incentive to steal stuff that you can resell to underground street markets. So it might well be inflation that causes crime.

How are Crime rates and Education related ?

One of the most dominant ideas under the umbrella concept of education's impact on crime is the belief that a reduction in crime can most often be achieved by increased crime prevention and that the most effective form of crime prevention is achieved through education. Most people would argue that education can be an important element in preventing individuals from engaging in criminal behaviour. Lochner (2004) emphasizes the role of education as human capital investment that increases future legitimate work opportunities, which discourages participation in crime. If human capital raises the marginal returns from work more than crime, then human capital investment and schooling should reduce crime. Many trends have been supported by contemporary research that has examined possible connections between education and criminal behaviour. That levels of education (higher and lower) are significant in the manifestation of criminal behaviour has received empirical support, as has the notion that individuals with learning disabilities (and thus with lower education, intelligence, and coping skills) are more prone to violent behaviour.

How does increase in Police strength decrease Crime ?

Empirical studies that use reported crime data to evaluate policies for reducing crime will understate

the true effectiveness of these policies if crime reporting/recording is also affected by the policies. For instance, when the size of police force increases, changes in the perceived likelihood that a crime will be solved may lead a higher fraction of victimisations to be reported to the police.

Sherman and Eck (2002) concluded that while there is consistent evidence that having no police (like during police strikes) significantly increases crime, the evidence of a marginal effect of increasing police numbers on crime is weak indeed. Adding more police officers, adopting strong, proven management techniques, can actually reduce the rate of crime. Even their combined impact, though, accounts only for a fraction of the documented reduction.

How are Crime and Conviction rates related ?

The conviction rate of a prosecutor or government is the number of convictions divided by the number of criminal cases brought. Whereas a crime rate is calculated by dividing the number of reported crimes by the total population. The criminal justice plays an important role, an increase in the effectiveness and probability of punishment, if high, might decrease the crime rate. It is naturally assumed that if the conviction rates are high then the chance of getting punished for a crime is also high which makes a criminal weigh his choices before committing a crime.

Historical Trends - Analysis of crime rate: (1973-2016)

Indian Penal code the following broad classification of crimes-

- i) Crimes against body: Murder, Attempt to commit murder, Culpable homicide not amounting to murder, Kidnapping and Abduction, Hurt, Causing death by negligence;
- ii) Crimes against property: Dacoity, Preparation and assembly to commit Dacoity, Robbery, Burglary and Theft;
- iii) Crimes against public order: Riots and Arson;
- iv) Economic crimes: Criminal breach of trust, Cheating & Counterfeiting;
- v) Crimes against women: Rape, Dowry death, Cruelty by husband or his relatives, Assault on women with intent to outrage her modesty, Insult to the modesty of women and Importation of girl from foreign country;
- vi) Crimes against children: Child rape, Kidnapping & abduction of children, Procurement of minor girls, Selling and buying of girls for prostitution, Abetment of suicide, Exposure and Abandonment, Infanticide and foeticide

Further, crime can be classified into-

- (I) Cognizable Crime : A cognizable offence or case is defined as the one which an officer in-charge of a police station may investigate without the order of a magistrate and effect arrest without warrant. Cognizable crimes are broadly categorised as those falling either under the 'Indian Penal Code (IPC)' or under the 'Special and Local Laws (SLL)'
- (II) Non Cognizable Crime : Non-Cognizable crimes are defined as those which can not be investigated by police without the order of a competent magistrate. Police do not initiate investigation in non-cognizable crimes except with magisterial permission.

There is a noticeable pattern observed in the crime against property (which includes dacoity, burglary, robbery, theft).

Dacoity was 10627 in the year 1973 and 3795 in the year 2016. Though there was an initial rise but after few years, the rate of dacoity started to fall. This shows an improvement in reducing crime in the society.

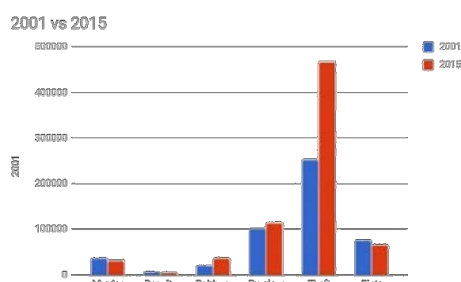
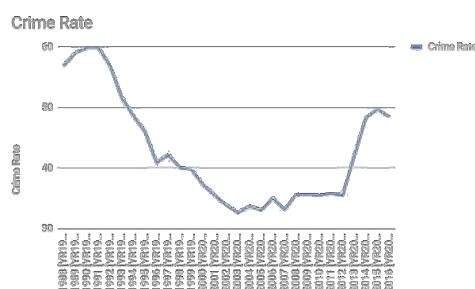
Robbery was 18857 in the year 1973. It has increased from 1973 till 1992. There was a downfall since 1992 to 2007 but there is not a big reduction in

the number. Post 1992 there was a continuous increase in the number and the number rose to 38071 in the year 2014.

Burglary in the year 1973 was recorded to be 181433. This too has seen a downfall. 91218 is the recorded burglary in the year 2007. This shows that burglary has reduced by 2 times. But post 2007 it has been increasing and has reached to a number of 111746.

Theft has experienced a decline in its number from 379412 in 1973 to 285043 in the year 2007. The scenario changed after 2007 and from then India is experiencing continuous rise in the number of theft every year and in 2016 it has reached to 494404, greater than that of 1973.

Therefore, the number of crimes against property as analyzed above shows that the crime against property has reduced subsequently till 2007 but has increased after that. The recent phenomenon like the financial crisis and the current political standoff seem to have contributed to this increase in crime rate. Thus, in order to have an improvement of the crime condition in India, these factors need to be stabilized.



Model Specification And Hypothesis

The general form of the models for political, economic and social factors affecting crimes may be written as -

$$\text{Crime Rate } t = a_0 + a_1 (\text{Lagged Inflation Rate}) + a_2 (\text{Lagged Unemployment rate}) + a_3 (\text{Education Index}) + a_4 (\text{Log Police force}) + a_5 (\text{Standardised Gini}) + u_t$$

Hypothesis 1- Economic Model

$$\text{Crime Rate } t = a_0 + a_1 (\text{Unemployment rate}) + a_2 (\text{Inflation Rate}) + u_{t1}$$

Hypothesis 2 - Political Model

$$\text{Crime Rate } t = b_0 + b_1 (\text{total police force}) + b_2 (\text{conviction rate}) + u_{t2}$$

Hypothesis 3 - Social Model

$$\text{Crime Rate } t = c_0 + c_1 (\text{Education Index}) + c_2 (\text{Inequality}) + u_{t3}$$

Description of variables

Variable	Description	Source
Crime Rate	This is the dependent variable. We have used property crime rates, specifically in our study	The data was collected from reports published by the National Crime Records Bureau
Conviction rate	The conviction rate of a prosecutor or government is the number of convictions divided by the number of criminal cases brought.	The data was collected from reports published by the National Crime Records Bureau
Total Police strength	The actual total police strength at the all India level.	The data was collected from reports published by the National Crime Records Bureau and from
Inflation Rate	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	International Monetary Fund, International Financial Statistics and police research data files.
Unemployment Rate (ILO estimates)	Unemployment refers to the share of the labor force that is	International Labour Organization, ILOSTAT database.

	without work but available for and seeking employment.	
Inequality And Poverty We have used standardized Gini index for the purpose of estimating inequality level in India	We have used standardized Gini index for the purpose of estimating inequality level in India	Solt, Frederick. 2016. "The Standardized World Income Inequality Database." <i>Social Science Quarterly</i> 97. SWIID Version 6.1, October 2017
Education Index	The Education Index is calculated from the Mean years of schooling index and the Expected years of schooling index	Human Development Report, UNDP

Description of variables

	Mean	Max	Min	SD	Mean	Total Crime Rate	Crime Rate	Inflation index	Unemployment Rate	Education Index	Total police Force	Gini Standard
	457096.2	641851	360879	74482.2	42.82966	457096.2	42.82966	7.632273	3.948276	0.4034524	1388992	45.4444
	42.82966	59.9	32.57	9.18334	7.632273	42.82966	42.82966	7.632273	3.948276	0.4034524	1388992	45.4444
	7.632273	13.87025	3.26256	3.173964	3.948276	7.632273	7.632273	7.632273	3.948276	0.4034524	1388992	45.4444
	3.948276	4.4	3.5	0.278543	0.4034524	3.948276	3.948276	3.948276	3.948276	0.4034524	1388992	45.4444
	0.4034524	0.535	0.3	0.0734318	1388992	0.4034524	0.4034524	0.4034524	0.4034524	0.4034524	1388992	45.4444
	1388992	1926247	1065874	220402.4	45.4444	1388992	1388992	1388992	1388992	1388992	1388992	45.4444
	45.4444	8	43.1	1.80025		45.4444	45.4444	45.4444	45.4444	45.4444	45.4444	45.4444

Regression Results-

General Model-

The multiple variable regression analysis that includes all the selected variables in the model, has an erratic result, giving opposite signs for several variables, even though squared R and adjusted R squared have an high value.

$$\text{Crime Rate}_i = a_0 + a_1(\text{Lagged Inflation Rate}) + a_2(\text{Lagged Unemployment rate}) + a_3(\text{Education Index}) + a_4(\text{Log Police force}) + a_5(\text{Standardised Gini}) + u_i$$

The table gives us the result of Multivariable analysis-

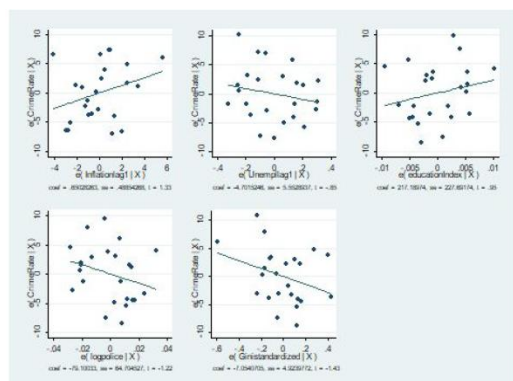
$$\begin{aligned} \text{Crime} = & 1406.804 + 0.6502826(\text{Inflation Rate}) - \\ & 4.701525(\text{Unemployment Rate}) + 217.1897(\text{Education Index}) - 79.10033(\text{Log Police strength}) - 7.054071(\text{Gini Standardised}) \end{aligned}$$

	Coefficient	Standard Error	T	p> t	[95% Confidence Interval]
Inflation Rate	0.6502826	.4885427	1.33	0.200	-.3761075, 1.676673
Unemployment Rate	-4.701525	5.552894	-0.85	0.408	-16.36772, 6.964672
Education Index	217.1897	227.6917	0.95	0.353	-261.1728, 695.5523
Log police strength	-79.10033	64.70453	-1.22	0.237	-215.0395, 56.83884
Gini standardized	-7.054071	4.923977	-1.43	0.169	-17.39896, 3.290822
Constant	1406.804	970.834	1.45	0.165	-632.843, 3446.45

We get an R² value of .7539. But variables have wrong sign, most probably due to model specification error and presence of a high degree of correlation between

variables, also indicating that the model chosen might be inappropriate.

Hence, we reject the first model and use our further specified model, instead of the combined variables model.

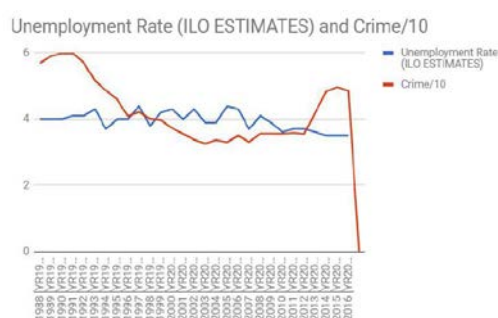


Hypothesis 1-

Crime Rate $t = a_0 + a_1 (\text{Unemployment}) + a_2 (\text{Inflation Rate}) + u_t$

In this model, we regress crime against the unemployment and lagged value of inflation rate.

We use lagged value of inflation rate since we assume that rise in prices takes some amount of time to have an impact on crime rates. The graph below shows the relationship between Unemployment rate and inflation.



The multiple variable regression analysis yields the following results -

Crime $t = 36.0712 + 0.8364859(\text{Inflation Rate}) + 4.255483(\text{Difference in Unemployment Rate})$

Crime Rate	Coefficient	Standard Error	T	p> t	[95% Confidence Interval]
Inflation Rate	0.8364859	0.5467136	1.53	0.139	-.2894918, 1.962464
Difference in Unemployment Rate	4.255483	5.819907	0.73	0.471	-7.73084, 16.24181
Constant	36.0712	4.442043	8.12	0.000	26.92264, 45.21976

We have an R-squared of .09 and an F value of .91. The F test shows that the variables are not jointly significant. The individual t tests also show that the variables are not significant.

We form a Correlation Matrix to check for Multicollinearity

e (V)	Inflation Rate	Unemployment Rate
Inflation Rate	1.0000	
Difference in Unemployment Rate	0.2422	1.0000

As the correlation coefficient between the variables is low, we suspect a low level of multicollinearity in data.

We also perform a test for autocorrelation, and find high level of autocorrelation in the data. To correct this, we use Robust Standard Errors, as shown below-

R-Squared= 0.0902

Crime Rate	Coefficient	Standard Error	T	p> t	[95% Confidence Interval]
Inflation Rate	0.8364859	.6634489	1.26	0.219	-.5299127, 2.202885
Unemployment	4.255483	4.971406	0.86	0.400	-5.983318, 14.49429
Constant	36.0712	5.262198	6.85	0.000	25.2335, 46.9089

The individual t tests show that the variables are still insignificant. We use F test for their joint significance and find that they are not jointly significant, also.

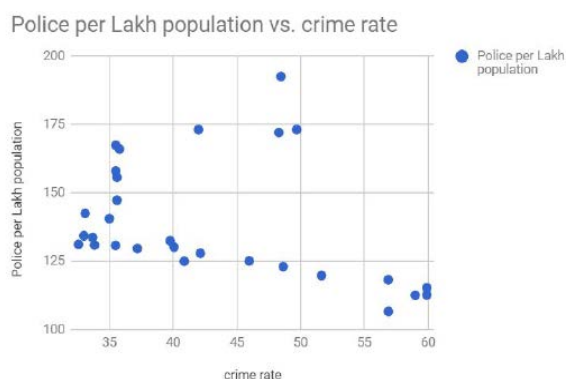
Hence, we reject the first model

Hypothesis 2 -Political Model

Crime $t = b_0 + b_1$ (total police force) + b_1 (conviction rate) + u_{t2}

Relation between Police strength and crime rate

As can be seen in the scatterplot below, there seems to be a negative relation between crime rate and police force per lakh of population, i.e. as police force increases, there is a coincident fall in the rate of crime.



Relation between Crime Rates and Conviction Rates

A high level of conviction rate between 2006-2010, seems to have coincided with a low level of crime rate. Further, a low level of conviction rate seems to be coincident with a much higher level of crime between 2006-2015. Thus, this proves our initial assumption between the relation between crime rates and conviction rates to be correct to some extent.

Lack of data on conviction rate poses a severe limitation to this result.



The multiple regression model gives us the following results-

Crime $t = 1091.63 - 76.62349 \log$ (police force) + 0.8936695 (conviction rate)

Crime Rate	Coefficient	Standard Error	T	p> t	[95% Confidence Interval]
Log Police	-76.62349	40.90241	-1.87	0.103	-173.3423, 20.09533
Conviction Rate	0.8936695	0.9258669	0.97	0.367	-1.295658, 3.082997

Constant Rate	1091.63	599.7471	1.82	0.112	-326.5465,2509.807
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The adjusted R-squared of this model is about 70%, which is quite high. The F test gives value of 11.62 and a p value of .006, thus indicating that the variables are jointly significant, even though they might not be individually significant.

Therefore, we suspect presence of Multicollinearity between the variables and hence calculate the correlation matrix.

Correlation Matrix of variables of regression model

e (V)	Log Police	Conviction Rate
Log Police	1.0000	
Conviction Rate	0.8250	1.0000

As suspected, there is a high degree of positive correlation between the variables.

We also perform Breusch-Godfrey LM test for autocorrelation, even though the test might be susceptible to error due to low number of observations.

Breusch-Godfrey LM test for autocorrelation-

Lags (p)	Chi 2	Df	Prob>chi2
1	2.136	1	0.1439

H0- There is No serial correlation

P value is high, which shows that there might be presence of Autocorrelation in our model.

To correct this, we use a model with robust standard errors.

Log Police	Crime Rate	Coefficient	Standard Error	T	p> t	[95% Confidence Interval]
		-76.62349	53.42856	-1.43	0.195	-202.962, 49.71499

Constant	1091.63	775.5313	1.41	0.202	-742.2102, 2925.47
Conviction Rate	0.8936695	0.8589099	1.04	0.333	-1.13733, 2.924669

-Hypothesis 3

Social Model- Crime Rate $t = c_0 + c_1 (\text{Education Index}) + c_2 (\text{Inequality Index}) + u_t$

The graph shown below, shows the relationship between Crime Rates and standardized GiniIndex, that was used to measure income inequality.

The multiple regression model gives us the following results-

Crime $t = -73.52632 -45.089 (\text{Education Index}) + 1.983181 (\text{GiniStandardised})$

R-Squared - 0.2007

Difference(Crime Rate)	Coefficient	Standard Error	t	p> t	[95% Confidence Interval]
Education Index	-45.0489	26.1576	-1.72	0.100	-99.4466, 9.348799
Gini standardized	1.983181	0.9045116	2.19	0.040	0.1021465, 3.864216
Constant	-73.52632	31.47263	-2.34	0.029	-138.9772, -8.075402

High R-squared shows us that about 20% of the variation in the model can be explained by Inequality Index and Education Index. The F value is 3.43, while its P value is .05, showing that the model is jointly significant. We suspect high multicollinearity in data, because of which we suggest performing the principal component analysis. But, since such analysis does not lead to unique relationship between the variables, we do not use it here. Thus, we see that 1 unit change in Standardised Gini, leads to change in crime rate, to increase by 1.983 units, *ceteris paribus*. While, 1 unit change in Education Index, leads to change in crime rate, to decrease by 45.04 units, *ceteris paribus*.

Conclusion

From our research, it is evident that certain social and economic factors do have correlation with the crime rates. The results of our findings have been summarized in the table below –

Model	Results
Economic Model - Crime Rate $t = a_0 + a_1$ (Unemployment rate) + a_2 (Inflation Rate) + u_1	We find presence of low degree Multicollinearity and autocorrelation in the data. We use Robust Standard errors to correct this. Since the F tests and t tests, both show the variables to be insignificant, we reject this model.
Political Model - Crime Rate $t = b_0 + b_1$ (total police force) + b_2 (conviction rate) + u_2	76% of the variation in the model can be explained by total police force and conviction rate. Since the F test shows the variables to be jointly significant, we fail to reject this model.
Social Model- Crime Rate $t = c_0 + c_1$ (Education Index) + c_2 (Inequality Index) + u_3	20% of the variation in crime rate can be explained by Education Index and Inequality Index. The F value is 3.43, while its P value is .05, showing that the model is jointly significant. We fail to reject this model.

Thus, policy measures that affect social and economic variables can have a significant impact on the crime rates, and thus, economic and social policy options can be successfully used in order to reduce the rates of crime,

significantly. The study is conducted on only property crime data, but we do believe that similar analysis could be constructed for other rational crime fields.

Our study suffered from serious limitation of lack of available data, because of which several large sample tests could not be conducted. Since the data is time series, we have sufficient reason to believe that there is existence of autocorrelation.

Limitation

This research work is carefully prepared, still we are aware of its limitations and shortcomings.

The limitations of this study present some space for further improvement in investigating the effect of property crime rate on economic variables. The first limitation is the number of the units of analysis that we used in our study is very small as we took a small range of years (1988-2016) to investigate this subject. Because of this it is difficult to find significant relationships from the data, as statistical tests normally require a larger sample size. Therefore enlarging the dataset is desirable.

The second limitation is that the data prior to 1988 had a different definition for property crimes and this further limited the scope of the analysis. The size of the sample had created a significant obstacle in finding a trend and a meaningful relationship.

The third limitation is the type of crime analysed (property crimes in our model). By investigating a broader set of types of crime, a more accurate analysis of magnitude of the relationship between the crime rate and economic variables might be done.

The data on Gini Index is collected from various sources as one source does not have the Gini Index for all the years for which we are conducting our research. So this is also a limitation that we encountered.

Apart from these problems we saw that there is a lack of prior research studies on this topic although various researches have been conducted for the total crime rate and not specifically for

the property crime rates. As prior research studies forms the basis of the literature review and helps in laying a foundation for understanding the research but due to the lack of this, it created a limitation.

Discovering these limitation can serve as an important opportunity to identify gaps in the research and to describe the need for further research.

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