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Economics of Property Crime Rate in Punjab

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This study intends to ascertain the impact of socio-economic, demographic and deterrent variables and the effect of technical criminal know-how and past criminal experience on property crime rate. The property crime equation comprises of the following independent variables: population density, unemployment rate, literacy rate, police strength and number of police proclaimed offenders in a society. The property crime equation has been estimated by using a time-series data set for Punjab from 1978 to 2012. We have applied Johansen cointegration approach to test the long run relationship among the variables. Empirical findings suggest that police strength has a deterrent effect while past criminal experience enhances property crime rate in Punjab. The study finds population density has a significant positive relationship while education has a significant negative relationship with property crime rate. Further we also find a negative relationship between unemployment and property crime which is supported by the concept of ‘consensus of doubt’ in the discipline of crime and economics.

JEL Classification: D6

1. INTRODUCTION

“People respond to incentives” is a universal truth that allows us to claim that people participate in criminal sector for their own social, psychological or economic incentives. Current study has focused on property crime rate that comprises of those types of offences that intentionally and deliberately attempt to or actually cause loss of property. A higher property crime rate discourages commercial activity which in turn distorts the process of economic growth. The social scientists particularly economists seem keen to identify the potential determinants of property crime that can be helpful for policy-makers in order to restore peace and stability. Becker (1968) introduced the crime and economics discipline by designating criminals and law enforcement agencies as rational individuals. Following in his footsteps economists from all around the world are contributing to investigate those potential factors which can affect the magnitude of crime rate in different societies.

Unfortunately there is a growing concern about higher crime rate in Pakistan but economics of crime have received a little attention in the country. All available studies, which review this newly emerging discipline have a common characteristic of using a country level data of socio-economic variables in explaining their effect on crime rate.

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The crime rate, however, seems sensitive to the geographical boundaries of countries. The sizable literature uses states, provinces, and even the districts level data to gain insights into this serious issue. Thus it seems better to observe the effect of various socio-economic and demographic factors on crime rate at sub-national level in Pakistan because there is lot of variation in most of the core socio-economic and demographic aggregates across regions. We use the sub-national data to estimate the crime rate equation in order to avoid the overstatement or understatement of the effects of various socioeconomic, demographic and deterrent variables. The current study has selected Punjab as a case study due to higher property crime rate there and its major role in Pakistan's economy. Moreover, we have focused on the property crime rate only because it is more responsive to socio-economic, demographic and law enforcement conditions of a society [Becsi (1998)].

The higher incidence of property crimes in Punjab has resulted in a state of insecurity, frustration and mental unrest that spells out a dire need to deal with the situation. Our empirical investigation focuses on those factors which can significantly affect the property crime rate but have been least focused in most of the empirical attempts available at country level literature of crime and economics. First, a deterrent variable labelled as police strength to check its deterrent effect on property crime rate has been included in the current study. Secondly, an explanatory variable population of police proclaimed absconders¹ has been incorporated in economic model of property crime to capture the effect of technical criminal know-how and past criminal experience on property crime rate. Finally population density; unemployment and education have been used as control variables to see their impact on property crime rate.

For this purpose we have applied Johenson Cointegration approach to a time series data set for Punjab from 1978–2012. The study finds a significant negative impact of increasing police strength and education on property crime rate. The increase in the number of police proclaimed offenders and population density have a significant positive impact on property crimes. In view of these findings, we believe current study will not only be helpful in proposing sound policy recommendations regarding property crime prevention but will also make useful contribution to the existing literature of crime and economics.

The study has been arranged as follows: we review the literature in Section 2. The theoretical framework is presented in Section 3. In Section 4 there is a debate on methodology used in empirical estimation along with the sources of data used. Empirical findings have been stated in Section 5 and finally concluding remarks along with policy recommendations are presented in Section 6.

2. LITERATURE REVIEW

Study of crime remained a subject of interest in each society during different eras. When father of economics Smith (1776) talked about the accumulation of wealth by people he also discussed the motivation of people towards crime and demand of people for the protection from crime. Paley (1785) reported the role of deterrent variables in

¹Police proclaimed absconders are the persons that have committed crime but crime prevention authorities are still unable to arrest these persons. A lot of police reports consider it as a vital reason of high property crime rate.

changing the magnitude of crime rate in different societies. However, there was the father of utilitarianism Bentham (1879), who introduced calculus while determining the criminal behaviour and optimal level of law enforcement by crime prevention authorities. Fleisher (1966), Tullock (1967), Rottenberg (1968), Becker (1968), Stigler (1974), Landes and Posner (1975) have contributed a lot to reconnect economists with Crime and Economics Discipline [Ehlich (1996)].

If we talk about the recent theoretical foundations of crime and economics, then we will have to go back to the contributions of Becker (1968) who led the foundations of theoretical model of criminal behaviour. He was of the view that every criminal is an economic agent as he commits crime only, when there is an expectation of increase in his utility. He also discussed the optimal structure of institutions that are responsible for crime prevention in some state by arguing that these institutions should be designed so that they should suffer minimum cost during crime prevention. In this regard along with Stigler (1968) he preferred private enforcement of law rather than public enforcement of law.

Landes and Posner (1975) criticised the above mentioned idea of Becker of turning the most likely and an ideal public enforcement of law into private enforcement of law. They were of the view that private enforcement has severe drawbacks as there can be possibility of under enforcement or over enforcement. However they favour the private enforcement of law only in civil offenses as these can be detected with an ease and can be punished at zero cost.

Friedman (1984) defended the idea of private enforcement of law by Becker and Stigler (1968) with the help of an historical example of Ireland where private enforcement of law prevailed for three hundred years not only in civil offences but also in most severe criminal offences like murder etc. during the Anglo-Saxon period. Friedman concluded that private enforcement is not as effective in offences under criminal law as it is in offences under civil law but these inefficiencies can easily be eliminated by making some minor changes in some of the formal and informal institutions that play vital role in crime prevention.

Friedman (1995) presented a new idea of turning the criminal law into civil law in support of the above mentioned Becker's idea about optimal enforcement of law. He argued that punishment for the crime prevention either in terms of imprisonment or execution is not optimal and turning of criminal law into civil law can enable a country to punish offenders in terms of monetary fines. In this way net cost of crime prevention will be zero and there will be lesser burden on taxpayers.

The above mentioned debate about the rationality of criminals and efficient law enforcement by a state is the main theme of modern crime and economics discipline. Since a criminal activity involves multi-disciplines but the current study will concentrate only on those national and international studies which are related to identifying socio-economic, demographic and deterrent variables of crime rate.

Gillani, *et al.* (2009) have empirically investigated the effect of unemployment, inflation and poverty on crime rate of Pakistan by using a time series data from 1975–2007. They applied Johansen cointegration approach to conclude that unemployment rate, poverty and inflation are granger cause of crime in Pakistan. After that Jalil (2010) investigated the link between urbanisation and crime rate in Pakistan using a time series

data set during 1964–2008. He also used Johenson cointegration approach in this empirical investigation and reported that a lack of planning regarding the expansion of urban areas increase crime rate while literacy rate and unemployment have a significant and negative impact on crime rate of the country.

All these studies had a little focus on deterrent variables in economic model of crime. Jabbar and Mohsin (2014) highlighted the measuring error problem and lack of deterrent variables in the economic modal of crime at country level literature. Using a time series data set for Punjab during 1978–2013, he applied Johenson cointegration approach and proved that police strength, high conviction rate and a higher literacy rate in a society have a significantly negative impact on murder crime rate while the impact of unemployment on violent crime is ambiguous.

In the large part of international literature the effect of various socioeconomic variables particularly the effect of unemployment on crime rate is ambiguous [Chiricos (1987)]. We will also discuss a few studies of crime and economics at sub-national level. Chiricos (1987) has also explored the unemployment crime relationship while other researchers like Coack and Wilson (1985) found insignificant and weak relationship between unemployment and crime rate. After a thorough research he concludes that we can get a weak and even an insignificant relationship between crime and unemployment if we use a time-series data or if we use the data of U.S economy for unemployment through the 1970s. He concluded that cross sectional studies better explain the relationship between unemployment and crime rate as compared to the time series analysis.

Imroho, *et al.* (2006) examined the effect of various economic, socio and demographic variables on the crime rate across different countries of the world with the help of a cross-sectional analysis. They selected at least one country from each of the continents of the world and they selected 1980 in USA as a benchmark year. They checked the effect of unemployment rate, fraction of low human capital individuals in an economy, income inequality, age categories, and the probability of apprehension along with duration of jail sentence on property crime. To check the effect of above said variables on property crime rate they used overlapping generation model to allow individuals to participate in either legitimate market activities or in illegal activities. In their final findings amazingly 79 percent people involved in property crime were not found unemployed but they were under employed. Moreover their model also predicted that 18 years of age or younger were 76 percent of the total criminals who participated in property crimes. Furthermore 46.1 percent people who were involved in property crimes did not have a high school diploma. Moreover they concluded that small differences in probabilities of apprehension and income inequality can generate a significantly large difference in the crime rates in similar environments.

Gumus (2004) investigated the effects of deterrent, socio-economic, and demographic variables on crime rate of 75 large US cities by using a cross sectional data. He concluded that per capita income and poverty are the root causes of crime in large US cities while the unemployment was statistically significant only in 1/8 of empirical equations used in this study.

Omotor (2009) used inflation, income, literacy rate, and unemployment rate to investigate their role in crime nexus of Nigeria. By using ECM and co-integration

approach, he tested the relationship between crime rate and above said socio-economic variables to conclude that unemployment has a positive relationship with crime rate while a low literacy rate and high population of Nigeria were not found the root causes of stimulating crime rate in Nigeria.

New developments are taking place in the crime and economics literature and providing new insights related to crime and its determinants. Current study also intends to bring forward some of the important causes of property crime rate in Punjab [Pakistan].

3. THEORETICAL FRAMEWORK AND EMPIRICAL PROCEDURE

In social sciences criminal behaviour can be discussed by different theories, however an economist has his own ideas to examine it. An economist always believes that people are rational and they respond to incentives so they treat criminals as economic agents as they participate in offences related to theft and snatching to enhance their utility. It can be argued that the choice between committing and not committing some criminal activity depends on the net-payoff (φ_i) of some criminal activity. Decision of participation in an illegitimate activity (P_i) by criminals is decreasing function of expected cost (C_i) and increasing function of gain (G_i) from criminal activity that can be described as under;

$$P_i = f(C_i, G_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

$$C_i = f(c_i, wl_i, p_i, f_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

$$G_i = f(L_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

Where, C_i is total cost faced while committing a crime and furthermore c_i can be described as direct cost i.e. time spend in planning and committing of a crime, efforts of self-defense,² wl_i denotes foregone market wages in case of arrest or conviction, p_i stands for probability of arrest or conviction and f_i represents the fines or other penalties in term of imprisonment. While in the above stated Equation (3), G_i is gross gain and L_i is something gained (loot) as a result of criminal activity. Thus net pay off³ φ_i can be defined as the difference of gross gain and total cost i.e.

$$\varphi_i = G_i - C_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

Or

$$\varphi_i = L_i - c_i - wl_i - p_i f_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

It can be claimed that a criminal activity takes place if and only if;

$$\varphi_i > 0$$

It is important to note that we consider the expected gains as economic incentives because theft and snatching are more responsive to socio-economic and law enforcement variables. The above discussion is core of economic model of crime used in

²Efforts made to avoid penalties, arrest, imprisonments or monetary fines etc.

³The net pay-off (φ_i) can also be stated as expected utility of committing some crime by a criminal.

the current study. After studying Buonnano, *et al.* (2008); Cherry, *et al.* (2002); Becsi (1999) and Jalil, *et al.* (2010) we have formulated the following economic model of crime;

$$\text{Crime} = f(\text{Population, Unemployment, Education, Police Strength, Police Absconders})$$

The above stated function contains those types of socio-economic, demographic and deterrent variables, which correspond to the theoretical framework of the current study.

The current study will use a demographic variable in the form of population density that can be the representative of urbanisation because property crimes are often considered as an urban phenomenon [Gumus (2004)]. The next variable used in our modal is unemployment, which is one of the most controversial variables of crime analysis, however it is likely to be correlated with crime in one or another way. Third variable, education can affect the decision of committing some crime as it increases the expected legitimate earnings. The next variable included in our modal is a deterrent variable labelled as police strength, which is expected to be negatively correlated with property crime rate of a society. The last variable included in our modal is the number of police proclaimed absconders in a society about which it can be argued that in case of a low opportunity cost of committing some crime police proclaimed absconders prefer to commit property crimes for their material wellbeing.

The above discussion enables us to specify the following empirical equation to estimate,

$$PC_t = \alpha + \beta_1 POP_t + \beta_2 UR_t + \beta_3 LR_t + \beta_4 PS_t + \beta_5 PPO's_t + e_t \quad \dots \quad (6)$$

Property crime (PC_t) is a dependent variable along with the independent variables, POP_t stands for population density, UR_t represents the unemployment rate, LR_t stands for the literacy rate, PS_t exhibits the police strength and $PPO's_t$ stands for the police proclaimed absconders in Punjab during some t year. We will estimate Equation (6) by using suitable econometric technique to get empirical findings of the study.

Since we have a time series data set so we will use the standard practice of checking the data to see if it is stationary or non-stationary by using unit root test. If unit root test⁴ discloses that all the variables are stationary at level then study will follow the simple OLS technique. If all the variables are non-stationary at level then study will follow the ARDL approach, finally if all the variables will be stationary at level 1 then the study will follow the Johenson maximum likelihood approach to find the long-run relationship among the dependent and independent variables.

4. DATA, VARIABLE CONSTRUCTION AND ECONOMETRIC ISSUES

A data set related to Punjab during 1978–2012 has been used for empirical investigations. In this regard a few *missing values*⁵ related to unemployment and literacy rate were obtained by calculating averages and using compound interest formula [Jalil (2010)].

⁴Study follows the Augmented Dicky Fuller test [ADF] to check if the data is stationary or not.

⁵We found missing values for those years in which labour force survey had not been published.

Table 1

Nature of Explanatory Variables their Brief Definitions and their Data Sources

| Variables | Nature of the Variable/ Definition | Source of Data |
|---|---|---|
| Property Crime | Depicts Criminal Behaviour/ It has been taken as sum of dacoity and burglary including motor vehicle snatching, motor vehicle theft, cattle theft, all other theft. | Various Issues of Punjab Development Statistics. Various Issues of Annual Crime Report, DIG Police (Crime), Punjab. |
| Population Density | Demographic/Population of Punjab in per square miles during some specific year. | Various Issues of Punjab Development Statistics. |
| Unemployment Rate | Economic/Number of persons who are unemployed out of the Total Labour force in Punjab. | Various Issues of Labour Force Survey. |
| Literacy Rate | Socio-economic/A person is said to be literate who can read and write his/her name. | Various Issues of Labour Force Survey. |
| Police Strength | Deterrent/ The number of police employees available to thousand members of Punjab in some particular year. | Various Issues of Annual Administration Report, AIG Police (Establishment), Punjab. |
| Number of Police Proclaimed Offender | Depicts Criminal Behaviour/ number of police proclaimed absconders present in society to 1000 member of Punjab. | Various Issues of Annual Crime Report, AIG Police (Crime), Punjab. |

4.1. Descriptive Statistics

Table 2 given below narrates the descriptive statistics for the variables used in this study. It becomes clear that in last 34 years, average value of Property Crime (PC) per 1000 persons is 0.59. Magnitude of coefficient of variation depicts that unemployment rate has least variation ranging from 5.5 to 8.6 and population density and PC/1000 are more volatile variables. Except the average value of proclaimed offenders which lies above the middle of data, averages of the rest of the variables in data lie almost in the centre of the data which shows that data is almost equally spread around its mean values.

Table 2

Descriptive Statistics

| Variables | Mean | S.D. | Min. | Max. | Coefficient of Variation |
|---------------------|--------|-------|--------|-------|--------------------------|
| PC per 1000 Persons | 0.590 | 0.201 | 0.300 | 1.098 | 34.08 |
| Population Density | 337.96 | 78.46 | 215.18 | 470.8 | 23.21 |
| Unemployment Rate | 6.971 | 1.024 | 5.464 | 8.606 | 14.69 |
| Literacy Rate | 45.424 | 9.59 | 31.25 | 60.6 | 21.11 |
| Police Strength | 1.326 | 0.302 | 0.838 | 1.911 | 22.83 |

| | | | | | |
|-----------------|------|------|-------|------|-----|
| Proc. Offenders | 0.21 | 0.23 | 0.022 | 0.88 | 110 |
|-----------------|------|------|-------|------|-----|

4.2. Estimation Procedure

Our purposed ADF test indicates that all the variables used in this study are stationary at (I=1), therefore, we apply Johansen Cointegration Approach to the following set of equations:

$$PC_t = \alpha + \beta_1 PD_t + \beta_2 UR_t + \beta_3 LR_t + \beta_4 PS_t + \beta_5 PPO's + e_t$$

5. EMPIRICAL RESULTS

Our purposed ADF test indicates that all the variables used in this study are stationary (I=1), therefore, Johansen Cointegration Approach is used for estimation purposes.

Table 3
Results of the Unit Root Test

| Variable | Only Intercept | Trend and Intercept | Conclusion |
|-----------------------------|----------------|---------------------|-------------|
| PC | | | |
| Level | -0.325323 | -3.806383 | |
| 1st Difference | -6.227111 | -6.218713 | I(1) |
| Population Density | | | |
| Level | 0.966131 | -1.798407 | |
| 1st Difference | -8.325482 | -8.626124 | I(1) |
| Unemployment | | | |
| Level | -2.757306 | -2.898596 | |
| 1st Difference | -5.029617 | -4.974713 | I(1) |
| Literacy Rate | | | |
| Level | 0.062647 | -3.277343 | |
| 1st Difference | -6.390288 | -6.275866 | I(1) |
| Police Strength | | | |
| Level | -0.002685 | -2.030985 | |
| 1st Difference | -4.144891 | -4.067436 | I(1) |
| Proclaimed Offenders | | | |
| Level | -2.831661 | -0.584165 | |
| 1st Difference | -3.867865 | -4.872781 | I(1) |

5.1. Results of Johansen Cointegration Techniques

Table 4
Cointegration Rank Test (Trace) [Property Crime]

| Hypothesised No. of CE(s) | Eigen Value | Trace Statistic | 0.05 Critical Value | Prob.** |
|------------------------------|-------------|--------------------|------------------------|---------|
| <i>None *</i> | 0.97 | 239.69 | 103.84 | 0.00 |
| <i>At most 1*</i> | 0.86 | 122.36 | 76.97 | 0.00 |
| <i>At most 2*</i> | 0.53 | 60.19 | 54.08 | 0.01 |
| <i>At most 3*</i> | 0.49 | 36.01 | 35.19 | 0.04 |
| <i>At most 4</i> | 0.25 | 14.33 | 20.26 | 0.27 |

| | | | | |
|------------------|------|------|------|------|
| <i>At most 5</i> | 0.15 | 5.05 | 9.16 | 0.28 |
|------------------|------|------|------|------|

Table 5

Cointegration Rank Test (Maximum Eigenvalue) [Property Crime]

| Hypothesised No. of CE(s) | Eigen Value | Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
|------------------------------|-------------|------------------------|------------------------|---------|
| <i>None *</i> | 0.97 | 117.33 | 40.96 | 0.00 |
| <i>At most 1*</i> | 0.86 | 62.16 | 34.81 | 0.00 |
| <i>At most 2</i> | 0.53 | 24.18 | 28.59 | 0.16 |
| <i>At most 3</i> | 0.49 | 21.68 | 22.29 | 0.06 |
| <i>At most 4</i> | 0.25 | 9.27 | 15.89 | 0.40 |
| <i>At most 5</i> | 0.15 | 5.06 | 9.16 | 0.28 |

Trace test indicates four cointegration equations while maximum eigen value test indicates 2 cointegration equations at 5 percent level of significance in property crime modal. Thus the variables of under discussion modal have long run relationship with each other. The null hypothesis stating that there are zero cointegration vectors is rejected.

The results of the estimated model are presented below.

$$PC_t = 1.3 + 0.008POP_t - 0.127UR_t - 0.059EDU_t - 0.065PPC_t + 0.393PPO's_t \quad (7)$$

(0.00036) (0.00388) (0.00310) (0.02042) (0.02307)

5.2. Interpretation and Discussion of the Results

Empirical findings indicate that there is a significantly positive relationship between population density and property crime which is consistent with the findings of Bechdolt Jr. (1975), O'Brien, *et al.* (1980) and Regoeczi (2003) who also found a positive relationship between property crimes and population density. Consistency of result with the literature of crime and economics allow us to claim that population density is one of the major determinants of property crime in Punjab.

The logic of this result is quite simple that an increase in population density decreases the probability of arrest, which leads to a lower cost for offenders, that motivates them towards property crime. It can also be argued that population density increases the number of criminals and crime targets and decreases protection of crime targets, which results in a positive relationship between property crime rate and increase in population density.

Secondly, we have found a negative and significant relationship between unemployment and property crime which is consistent with the empirical findings of Entorf and Spengler (2000) who have reported negative estimates for some of the theft crimes. Cantor and Land (1985) also argued that unemployment could have both a positive and negative impact on crime rates. Imrohorglu (2001) concluded that about 79 percent of the people engaging in criminal activities are employed thus it can be argued that rise in property crimes is not only related to illiterate, unemployed and the poor class of a society but rich, educated, employed and underemployed people can also boost these types of crimes particularly in societies like Punjab.

Consensus of doubt in crime and economics discipline provides some technical reasons of such a negative relationship between unemployment and property crime. In this regard they state that most often unreliable figures of crime and unemployment data are available because official rates of unemployment considerably understate the true numbers of people who are without work. Similarly crime prevention authorities often understate or overstate the true number of registered crimes for their own incentives. The above mentioned discussion reveals that a general belief of positive relationship between unemployment and crime is not necessarily proved true in each study [Orsagh and Witte (1981)].

Thirdly, there is a negative and significant relationship between literacy and property crime rate, which is consistent with the empirical findings of Buonanno (2003), Lochner and Moretti (2001), Usher (1997), Lochner (2007) and Jalil, *et al.* (2010). The economic rationale behind this empirical finding is that a literate person is relatively more risk averse and forward-looking, which produces a negative association of education with illicit behaviour.

Moreover, current study yields a significantly negative relationship between property crime and per capita police men available to society, which is similar to the findings of Sjoquist (2012), Baltagi (2006), Vollaard (2005), Berkeley, *et al.* (2012), Kelaher and Sarafidis (2011). It can be argued that an increase in per capita police men available to society increases the probability of arrest that leads to a higher expected cost of crime. It is well known that police effectiveness regarding detection and prevention of crime in Punjab depends upon the geographically focused police practices along with the hot-spots policing. As property crimes are often considered as an urban phenomenon, the presence of free media and influential personalities in these areas compel crime prevention authorities to deter property crimes first. Crime prevention authorities try to depute their most efficient employees to deter the property crime for the sake of departmental reputation and for some of the other job related incentives. Thus this result is not only consistent with the international literature but also quite logical and corresponds to the current culture of most of the institutions of the province.

Finally, current study has reported a significantly positive relationship between property crime and increase in number of police proclaimed offenders in a society. It explicitly means that if number of police proclaimed absconders increase in some society then obviously there will be an increase in property crime rate of that society. This result is quite logical and dynamics of this result need some discussion. When police department declares a person as an absconder then termination of such a person from legitimate labour market is not amazing because a person of such repute is not accepted as a labourer by any person or organisation. Furthermore, fear of arrest, imprisonment and monetary penalties do not allow him to join legitimate labour market for legal earnings. Then it becomes inevitable for such a person to commit crime of theft and snatching for his survival. The above reasoning supports a positive and significant impact of population of proclaimed offenders on property crime rate as a police proclaimed offender has a lower opportunity cost of committing a crime.

It is also very important to note that these persons have not only a low opportunity cost of committing property crime but an adequate criminal know how from their past criminal experiences helps them a lot. All these factors support our positive and

significant relationship between number of police proclaimed absconders and property crime rate [Buonnano (2008); Fajnzylber, *et al.* (2002); Sah (1991)].

CONCLUDING REMARKS

The main objective of the study was to identify the impact of socioeconomic, demographic and deterrent variables on property crime rate of Punjab empirically. For this purpose a time series data set from 1978–2012 was used. Johenson cointegration approach has been applied to test the existence of long run relationships among the variables.

A positive and significant relationship of population density with property crime is first empirical finding of the study, which leads us to believe that population density is the main determinant of crime in Punjab. Although unemployment depicts a negative relationship with property crime. It may be due to the technicalities of data or empirical procedure that study has adopted.

Third major finding of our study is that education plays a vital role to control property crime rate in Punjab as literacy rate has a negative and significant relationship with property crime. The empirical results have proved that there is a deterrent effect of police strength on property crime rate and finally an increase in number of police proclaimed offenders in a society has a positive and significant effect on property crime rate.

Policy Implications

The study brings forth some important policy recommendations regarding crime prevention in Punjab. Authorities should concentrate on controlling population growth rate in Punjab to make the province less dense and there should be effective planning particularly in urban areas regarding infrastructure. Developing new housing colonies near populated areas can be an effective measure to minimise the effect of increasing population densities on property crime rate. Promoting education level can be a valid remedial measure to minimise the criminal behaviour. The state should create not only more job opportunities but also improve the real wages of prevailing jobs, otherwise education without jobs can be a curse as awareness and technicalities of educated individuals can promote white collar crimes. Finally, enhancing the police strength by new recruitments, providing them a better training, better transportation, better tools of communications and advance weapons can be an effective measure in detection and prevention of crime in Punjab.

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