Determinants and Maximum Likelihood Functions of Juvenile Crime in Punjab, Pakistan

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ABSTRACT

Juvenile Delinquency and crime is a worldwide phenomenon. Until recently, Pakistan authorities have realized the magnitude of juvenile crime and evinced keen interest in scientific and empirical studies on juvenile's crime, its causes, prevention/ control and rehabilitation. Thus, the juvenile delinquency would be a serious threat to social and moral fabric of the society in the near future. The study was conducted at Faisalabad and Bahwalpur Districts in Punjab Province, along with two Borstal Institutions and Juvenile Jails. A sample of 221 juvenile convicts in both jails was taken for data collection. Traditionally money, land, women, old enmity are described as causal factors. Thus, it seems imperative to identify and analyze the determinants of juvenile crime in Punjab Province. A Probit Model was estimated to identify the determinants of juvenile crime (murder). The results showed land dispute, honor killing, inferiority complex, large family size, income disparity, and friend's motivation are the main determinants of the juvenile heinous crime.

Key Words: Juvenile; Crime; Murder; Probit

INTRODUCTION

Juvenile Delinquency has become a global epidemic and is spreading in developing and developed societies in both organized and semi-organized manners. In any civilized society, the criminal justice system has the highest premium as it guarantees the rule of law and fair play to its citizens. In fact, economic growth is unthinkable in a country where there is strife and fear for one's life and property (Khan, 1997). The delinquent person is guilty of anti-social conduct, perhaps less serious than criminal of misconduct. The other cited factors responsible for juvenile delinquency are: broken homes, delinquent community environment, bad company of peer/ school group, slums with criminal neighborhood, poverty, and unemployment (Auolakh, 1999).

In Pakistan, money, land, sexual assault, illiteracy, honor killing, old enmity, and drug are the main factors causing juvenile delinquency. The recent emergence of militancy "*deeni madras*" (religious education institutions) has further exacerbated the situation. These institutions impart instruction in militancy and sectarian hatred to young persons below eighteen years of age. The determinants of juvenile murder are higher age group, bigger family size, community environment, inferiority complex, personality trait, land dispute, honor killing and financial status. Other factors like education of the respondent and his father, residential status of the murderer before committing the act; friend's motivation and basic needs are also positive but not significant.

The Cyber Net has developed tendency of gang wars among the youth of both developed and developing nations and Pakistan is no exception in such delinquencies (Nadeem, 2002). The dearth of scientific literature on crime, especially juvenile delinquency in Pakistan is attributed to the lack of relevant data (Usmani, 1978). In the light of above discussion, it seems imperative to make a serious beginning to address serious social problems.

Juvenile delinquency is becoming a serious social taboo. The social dimension of the problem has serious repercussions on the moral and social fabric of the society. The family unit is tearing apart and parents are generally worried about the future of their offspring's. Furthermore, the surge of sectarian violence especially among teenagers has further exacerbated the growing evil of youth delinquency. Thus, if the increasing trend of youth delinquency is unabated and un-noticed, this will further create socio-economic problems of stunning proportions.

Therefore, there is a dire need to undertake a study in order to identify the casual factors of Juvenile Delinquency and suggest remedial measures to arrest its fast growing trends. The study will be useful for the policy makers, law enforcing agencies and civil society.

METHODOLOGY

The present study was conducted in two districts of Punjab, namely, Faisalabad and Bahawalpur. In Punjab Province, two Borstal Institutions and juvenile jails are working for rehabilitation of juvenile convicts. The total population of juvenile convicts having 221 respondents was taken for the study. A well-designed and structured questionnaire was developed and pre-tested. The data were subject to econometric analysis and SPSS package was used to estimates the Parameters.

The empirical analysis employ the non linear

Table I. Descriptive Statistics and Variables used in Probit Analysis

Variable	Description
MURD	1 if the juvenile commit murder; zero otherwise
RESPONAG	Age of the respondent in years
EDU	Years of schooling completed by respondent
FEDU	Years of schooling completed by respondent's father
MEDU	Years of schooling completed by respondent's mother
STATRESI	Dichotomous variable equal to unity if place of residence is rural; zero otherwise
FAMSIZ	Family size (number of members)
COMENVR	Dichotomous variable equal to unity if Peoples in community violate the law, zero otherwise
INFERIOR	Dichotomous variable equal to unity if respondent experiences inferiority complex; zero otherwise
FRNDMOTI	Dichotomous variable equal to unity if friends motivated juvenile to commit murder, zero otherwise
BASCNEED	Dichotomous variable equal to unity if Basic needs fulfilled by parents; zero otherwise
PERSTRAI	Dichotomous variable equal to unity if personality trait (emotional); zero otherwise
LAND	Dichotomous variable equal to unity if reason for committing murder is land dispute; zero otherwise
RETALIAT	Dichotomous variable equal to unity if reason for committing murder is retaliation (honor killing); zero otherwise
LOINCO	Income < Rs. 4000 equal to unity otherwise zero
HIGHINCO	Income > Rs. 4000 equal to unity otherwise zero

*Where:

M= Murder is dependent variable, independent variables are defined in Table.I along with relevant statistics b_0 b_{15} are parameters to be estimated

e= is the error term

maximum likelihood probit estimate technique for the juvenile murder. The equation is specified as:-

$$M_i = a + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_k X_{ki} + e_i \qquad 1$$

$M_i = 1$ if juvenile crime is murder; otherwise zero;

X_j is a set j^{th} explanatory variables where j = 1 ---k

Such models are appropriate when the choice between two alternatives depends on the characteristics of the problem Amemiya (1981). To estimate these types of model, there are two most commonly used approaches. These are:

i. Linear Probability model (LPM)

ii. Non linear Probability Model (NLPM)

a) The Logit Model

b) The Probit Model

The LPM is the simplest of three models in that it can be estimated by the familiar OLS set up. Although LPM is simple to apply, these models are fraught with several problems, such as non-normality and heteroskedasticity of the error term and it allows the predicted values of the dependent variable to fall outside the unit interval Capps and Kramer (1985). The problems are surmountable[1] but even the LPM is logically not a very attractive model because it assumes that the marginal or incremental effect of explanatory variable (X) remains constant throughout. These difficulties can be overcome by using monotonic transformation (Probit and Logit specifications), which ensures that the values of prediction be within the unit interval Capps and Kramer (1985). Among the NLPM models both Logit and Probit usually lead to the sa conclusions for the same data[2].

The choice as to which specification be used is a matter of mere convenience (Hanushek & Jackson, 1997). However, Probit model is selected for the analysis of juvenile murder. The function used in Probit is the inverse of the standard normal cumulative distribution function.

The probit model. The Probit model is associated with the cumulative normal probability function. To understand this model, assume that committing juvenile murder depends on an unobservable continuous index Z_i that is determined by the explanatory variables in such a way that the larger the value of the index Z_i the greater the probability to commit juvenile murder.

Now assume that there is a critical cut off value of the index Z_i^*

which translates the underlying index to commit juvenile murder Specifically,

M = 1 if $Z_i > Z_i^*$

M = 0 if $Z_i \leq Z_i^*$

The Probit model assume that Z_i^* is normally distributed random variable, so that the probability of Z_i^* is less than or equal to Z_i can be computed from the cumulative normal probability function.

$$P_i = \Pr(M = 1) = \Pr(Z_i^* \leq Z) = M(Z_i) \qquad 2$$

$$P_i = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z_i} e^{-t^2/2} dt .$$

$$P_i = F(Z_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\alpha + \beta X_i} e^{-t^2/2} dt . \qquad 3$$

Where t is a standardized normal variable, i.e. t ~ N (0,1)

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[1] For example, we can use WLS to resolve the heteroskedasticity problem or increase the sample size to minimize the non- normality problem. By resorting to restrict least squares or mathematical programming techniques, we can even make the estimated probabilities lie in the 0-1 interval.

[2] See Robert (1998) and Gujarati (2003)

P_i represents the probability that an event occurs juvenile murder in the instant case. Since this probability is measured by the area under the standard normal curve, so more the juveniles are likely to commit murder, the larger the value of the index Z_i. Inverse of the cumulative normal function (A) is applied to obtain estimates of the index Z_i. That is

$$Zi = F^{-1}\ (Zi) = F^{-1}\ (Pi) = \alpha + \beta X_i \qquad 4$$

Where F^{-1} is the inverse of the normal cumulative function.

Marginal effects can be obtained by calculating the marginal probability, which represents a change in the probability that $Y_i = 1$ given a change in k-$_{th}$ explanatory variable, as

$$\partial P_i\ /\ \partial X_{ik} = f\ (X_i\ /\ \beta)\ \beta_k \qquad 5$$

Where f (.) is the value of the standard normal density function, evaluated at the mean of the exogenous variables (Kwakyi *et al*., 1989; and Capps & Kramer, 1985)[3]

Estimation of probit model. The data reveals that 71 percent of the juvenile crime is murder, which is characterized as one of the heinous acts ever committed by human beings. The murder is specified as the dependent variable having value as one and zero otherwise. The estimating probit model is specified as below:

M = b_o + b_1 EDU + b_2 RESPONAG+ b_3 FEDU + b_4 MEDU + b_5 FAMSIZ + b_6 STATRESI + b_7 COMENVR + b_8 INFERIOR + b_9 RNDMOTI + b_{10} BASCNEED + b_{11} PERSTRAI + b_{12} LAND + b_{13} RETALIAT +b_{14} LOINCO + b_{15} HIGHINCO+e

*The variables and relevant statistics is given in Table I

RESULTS AND DISCUSSION

The empirical analysis of juvenile murder is presented by implying maximum likelihood (Table II). Probit estimation techniques using the cross sectional data collected during the year 2003. Of the total sample, 71 percent juvenile has committed murder, which is a very heinous crime by any standard. This analysis is first of its kind using an advance econometric model.

The analysis reveals that the coefficient of age is significant at 5 percent level with probability of committing murder by 0.043. The coefficient of mother's education having expected sign is significant implying that one-year increase in education lowers the possibility of committing murder by -0.016. The coefficient of family size is significant at 5 percent level. Marginal effect of additional member increases the probability of committing juvenile murder. The juveniles living in communities notorious for crimes or other offences are more subject to such kind of

Table II. Estimates Maximum Likelihood Functions and the Marginal Effects of Juvenile Murder in Punjab, 2003

Variables	Coefficient	Standard Error	Marginal Probability
Responag	.13458**	.07610	.04301
Edu	.02150	.02840	.00687
Fedu	-.00499	-.19831	-.00159
Medu	-.05099*	.03793	.01629
Statresi	.08584	.21913	.02744
Famsiz	.07588**	.04004	.02425
Comenvr	.78587***	.22433	.25117
Inferior	.62237***	.21421	.19891
Frndmoti	.19219	.23225	.06142
Bascneed	-.14644	.21238	-.04680
Perstrai	.39794**	.22517	.12718
Land	.69864***	.30571	.22329
Retaliat	.37984**	.24721	.12140
Lowinco	.37615**	.23198	.12022
Highinco	.00837	.33390	.00267

* indicate that the coefficient is significantly different from zero at 0.1 probability level
**indicate that the coefficient is significantly different from zero at 0.05 probability level
***indicate that the coefficient is significantly different from zero at 0.01 probability level

omissions and commissions.

The children having bad community environment have 0.25 probability of committing juvenile murder. The coefficient of inferiority complex is highly significant. Thus implies that inferiority in juvenile offender further increase the probability of committing murder by 0.20. The personality traits of the respondents also influence juvenile behavior. The coefficient of personality trait has positive sign and is significant at 5% level. The emotional children have 0.12 marginal probability of committing juvenile murder. Land dispute and retaliation (honor killing) are inter-related factors, which are common in our society. The coefficients of both variables are significant.

The marginal probability of land dispute is 0.22, which implies that children commit more murder due to the fact that land is an important source of income and social repute, while the marginal probability of retaliation is 0.12 connotating that retaliation had less effect on the juvenile murder than those of land dispute. The results are consistent with the earlier research (Auolakh, 1986). The coefficient of low income is significant and has positive relationship with juvenile murder. Children of the families with low income indulge themselves in different criminal activities. The marginal effect of an additional decrease in the income caused an increase in committing murder. The marginal probability of committing murder of high-income families is 0.0026, which is far less than that of low-income families.

[3]This formulation is applicable only for the k-$_{th}$ continuous variable. The marginal probability for a dichotomous variable can be computed by taking the difference between the probabilities when the variable takes the value 0 and 1 while holding all other variables constant at the mean values

CONCLUSIONS

The determinants of juvenile murder are higher age group, bigger family size, community environment, inferiority complex, personality trait, land dispute, honor killing and financial status. Other factors like education of the respondent and his father, residential status of the murderer before committing the act; friend's motivation and basic needs are also positive but not significant. The policy implications derived from these results are that population control measures may be taken and major thrust must be given to alleviate poverty in order to reduce juvenile murder. The land dispute and honor killing are yet other important variables, which should be addressed at the community level in order to reduce land dispute and self-respect.

The community environment must also be improved by providing general immunities, recreational facilities and playgrounds so that youth in the country are engaged in healthy activities. The parents and family members while tending their offsprings with great care can address the inferiority complex and personality traits. The parent's attitude must be friendly and manner oriented in developing the child behavior rather than authoritative, nagging and fixing (mother fixation).

RECOMMENDATIONS

1. Mother's education matters a lot intending and mending the child behavior in a positive manner, therefore, it is emphasized to encourage female education. It is common saying that the best school for a child is the lap of a mother.

2. The community environment should be hospitable having educational and recreational facilities.

3. Public awareness regarding juvenile behavior, parent's attitude, and juvenile friendly atmosphere must be provided through electronic and print media.

4. Thrust on poverty reduction should be a top priority to remove such social evils from the society.

5. The government should put emphasis on social development and agrarian reforms, especially land reforms, to help avoid the juvenile involvement in such crimes.

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