

Relationship between Crime and Economic Conditions in Punjab A Time Series Approach from 1984-2015

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Abstract: Using the time series data from 1984 to 2015, this study attempts to explore Punjab economic situation and the relationship between criminal activities. Six variables are used for economic conditions, such as crime as a dependent variable, male dropout ratio, female dropout ratio, unemployment, household size and urbanization. We check their relationship with the reported crime. Augmented Dicky Fuller test for unit root process indicates that all variables are stationary at the level and first difference. For long-term relationships, Johansen Cointegration technology has been applied. The results of the statistical process show that dropout ratio and unemployment and other variables are closely related to crime. VECM has been applied to check the short-run relationship between the variables. VECM results show variables adjustment towards equilibrium. Study gives evidence that economic conditions have significant impact on crimes and increasing dropout, unemployment which is Positive related with crime in Punjab. It is also shown that the crime is influenced by economic condition.

Keywords: Crime rate, dropout, unemployment.

1. Introduction

Crimes have always plagued everywhere in human society. The account of crime is as timeworn as old times of mankind. Cain, son of Adam and Eve committed first crime by murdered his brother. Crime has a complex nature as a subject, for example, regarding its reasons and cost, various academic disciplines such as criminology, sociology, geography, psychology and demography study it from their own perspective. A relatively new emerging field, however, is the economics of crime which tries to identify the socio-economic causes and consequences of criminal activities in a society. Crime define in a wrong way by the state or the

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parliament of the country or law of the land. Each country sets out series of acts (crime), which are prohibited, and punishes a criminal of these acts by a fine or imprisonment or both.

Tappan (1960) defined that "A crime is an instrumental act or omission in violation of criminal law. The importance of economic growth has no denial both in theoretical and empirical economic literature. Growth of the economy is a fundamental objective in any policy decision making. Economic growth of an economy for a sustained period of time is a condition for poverty alleviation process. It makes possible the generation of employment opportunities as argued in Okun's law. Generated employment increases the sources of higher incomes. It is the economic growth that has enabled the modern world to achieve the development objectives of sustenance, Self-esteem and servitude. Objective of poverty alleviation can be achieved by increasing growth of the economy. The establishment of the basis of sustained growth trajectory of the economy warrants a suitable environment for investment. Though a sufficient amount of investment in talent and effort for policy making plays a vital role in growth and development of the economy yet law and order situation and governance has its own importance. Bad law and order situation and crimes create conflict in the economy. Crime increases uncertainty in the society. Crime is an intolerable phenomenon in any civilized society. The history of crime dates back to the origin of human history on this globe .There is no universal and permanent definition of the crime. In different era different definitions were presented. Any act or an omission that is forbidden, for the protection of public, by public law and is liable to be punished in a legal arranged in its own name is a crime (Marshal and Clark, 1952). In other words, crime is an Instrumental act of violation of law that is committed without any justification and sanctioned as offence by the state. Gillado and Tan-Cruz (2004) discuss about murder, physical injury, rape, theft, homicide and robber these crimes have their socioeconomic significance in the economy.. Crime is associated with money and acceptance the law breaking behavior. Crime discourages economic activities and hence is the burden in the development of the country. Organized crime is more damaging. Crime creates problems in daily life and it challenges the capability of the government. Crime affects negatively the accumulation of physical,

human and social capital. It increases production costs as because of crime expenditure on insurance premiums and private security increased. Crime also destroys the social infrastructure of the society. Fear generated by criminals affect productivity when employees are willing to work few hours or even not willing to work in a specific time periods or near in bad neighbors Higher criminal activities have created insecurity in the economy.

Various reasons support that education make less criminal activities; first schooling increases the return to sincere work and increase opportunity cost of illegal behavior Freeman, (1996). Furthermore, custody and big punishment needs for t for the criminal behavior. If higher wage is offered then opportunity cost of schooling becomes higher. Second, schooling may have direct effect on financial reward itself. Finally, schooling may affect the change preferences in indirect ways, which may affect decision to involve in crime. For example education leads to more one's patience (Becker and Milligan, 1997).

Other economic variable also affect crime and one of them is unemployment. Crime and labor market are interlinked. The incentive for the criminal activities increases with the unemployment, zero income and low income which makes the cost benefit analysis easy for the individual (Fleisher, 1966).

1.1 Unemployment and Economic growth

Unemployment is a multi-dimensional phenomenon; it is an economic phenomenon showing imbalance in economic activity. Moreover, it is also considered social phenomenon because of its effects on the social structure of societies. For the objectives of monetary policy or fiscal policy economic growth is main goal. The investment leads to achieving rate of sustained economic growth in the national economy and addressing the problem of unemployment. The greater the unemployment rate; the less opportunities to achieve high economic growth as well as the emergence of the negative social aspects. Unemployment is an worldwide marvel with the economic and social effects. All countries including developing ones confront this phenomenon; these states move slowly in economic growth whereas affected by population growth with a design and shape of the population pyramid, revealing a high rate of dependency

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and causing the high economic and social cost of unemployment and its relationship to economic growth. When community does not use work force fully is called unemployment condition (Habees 2012).

1.2 School dropout and crime

We define dropout as, any student who leaves school for any reason before graduation or completion of a program of studies without transferring to another elementary or secondary school. High school dropouts are having a harder time finding and keeping jobs than individuals with higher levels of education. Young high school dropouts are much less likely to be active labor force participants than their higher-educated peers. Dropping out of high school is positively associated with crime (Thornberry 1984). Education has two possible ways to reduce crimes. First way is that good education increases the opportunity cost of crimes because criminal needs time for committing crime and that time cannot be used in other productive purposes like legal work because high education confirms the better job opportunities in legal sector. Second is the time wastage of criminal for being in custody or in jail. This cost is very high for criminal because he can raise his income by spending his time in other ways (Lochner 2007).

1.3 Household size and crime

Large Household or more children increase the consumption level and these phenomena create high poverty level (Libois 2018). If family members are more and income level less than people do criminal activity for fulfill their consumption needs. High household size positively related to crime. As household size increase and income level low, then it lead to increase the criminal activity.

1.4 Urbanization and crime

Urbanization also effect crime rate. People don't have jobs opportunities in rural areas so people move to cities. Unplanned urbanization may contribute to crime, and since urbanization in Pakistan is unplanned (Arif 2003).

1.5 Research questions

After excess of studies, multiple questions arise in mind. Is dropout of children contributing to crime? Is child labor responsible for the dropout of children from school? How large household contributes in crime? How crime and economic growth links? How unemployment effect crime?

1.6 Objectives

To determine the association between reported crime and economic conditions.

To find out the connection between dropout ratio and reported crime.

To trace the relationship of unemployment and reported crime.

1.7 Research methodology

This present study uses time series data, therefore estimation techniques need to be consistent with the standard properties of time series data. Unit root exist in time series data. If time series data contains unit root, then Ordinary Least Square (OLS) cannot be used to report consistent and efficient estimates. Therefore, for check the presence of Augmented Dickey Fuller (ADF) unit root used in study. However, in case of evidence of unit roots in the data, Johansen Co-integration technique can be used to find the association between variables. For check the long run and short run results and impact on independent variables on dependent Vector error correction model and granger causality use. These two modifications contribute to the validity of the estimates.

The maximum possible number of years of time series data has been collected, that is, from 1984 to 2015 which make it of 32 years data. In this context, the study is restricted to the total of six variables for ensuring sufficient degree of freedom for econometric modeling. Out of these six variables, dropout male and female, unemployment, Urbanization and household size are independent variables whereas; crime is the dependent variable. Econometric properties of the estimates are checked using various tests.

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1.8 Research gap

Researcher carried studies by concentrating on crime reduction. This research focused on crime study on Pakistan level but there is no study on Province level to understanding crime effects on state so this become a research gap. Education is necessary to reduce crime because more education less unemployment and less crime. More educated will less likely to go for crime (Moretti 2009).The above study is well organized but still there are many loop holes that need to be filled with rigorous research work, with the proper organizing of institutes. If institutes and staff are not well established then there will be more dropouts and unemployment.

2 Literature review

Goulas (2012) explored that how the crime-uncertainty interaction impacts on economic growth. Using a panel of 25 countries over the period 1991-2007, he find evidence that increased crime has an asymmetric effect on growth depending on the future prospects of the economy as reflected in the degree of macroeconomic uncertainty. the results indicate that higher-than-average macroeconomic uncertainty enhances the adverse impact of crime on growth implying that a 10% increase in the crime rate can reduce annual per-capita GDP-growth by between 0.49 and 0.62 percent.

Habees and Rumman (2012) argued that relationship between unemployment and economic growth in Jordan and some Arabcountries. Unemployment is considered as an economic indicator in this study. The high rates of economic growth and the decline in the unemployment rate do not confirm the existence of strong relationship between growth and unemployment. Despite the rate of growth is positive, it is not possible at present to reduce unemployment rates significantly in some Arab countries such as Algeria due to restructuring the Algerian economy which relies heavily on growth in the hydrocarbon sector, which despite its importance does not create jobs in large numbers.

Kumar (2013) explained state level data to analyze causal links between crime and growth. It is found, applying instrumental variable methodology, that higher levels of crime rate hamper per capita income and economic growth rates. International homicide and robbery rates negatively affect growth rates. Lowering of the homicide rate at national minimum level increases average annual growth rates. Moreover, it is observed that loss in growth is smaller in the states with higher per capita income. The results in Kumar (2013) are evident that quality of political, legal, economic institutions and socioeconomic policy environment may be helpful to crime levels and economic growth.

Raja *et al.* (2013) described time series data explored the relationship between economic conditions and criminal activities in Pakistan. Dicky Fuller test suggested that all variables are stationary at the first level. For the long run relationship Johanson cointegration technique applied. Coefficient of Gini index is high which means that in long run income inequality affects the crime ratio. Inflation reduces the purchasing power which becomes a cause of crime.

Ahmad *et al.* (2014) study examined the impact of crime on the economic growth of Pakistan by using yearly data from 1980 to 2011. Autoregressive Distributive lag (ARDL) to cointegration is used to find short and long run relationship between crime and Economic growth. In short run crime has negative, but insignificant effect on economic growth. Results of long run reveal that crime has negative and significant effect on economic growth. This negative relationship between crime and economic growth highlight that criminal activities slow down development projects as well as growth of Pakistan economy

Latif *et al.* (2015) discovered the causes of student's dropouts. In different areas there are different reasons for student dropout. Students never dropout from school for a single reason. The main reason is weak financial and economic problems. Education is a basic key for refining life standard, employment opportunities and high efficiency level. If dropout ratio increases fast it may decrease productivity level and unemployment ratio.

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Guzman (2015) analysed the effects of crime on Mexican city. Periodical data from 1990 to 2010 used in this study. Vector Error Correction model used to find the results. The short run results exposed that none of the constituents of aggregate demand distress crime and that the only constituent of aggregate demand affected by crime is private consumption, which is affected negatively by an increase in the crime rate. Further results revealed that crime has a positive effect on GDP, government consumption and imports in the long run. On the other hand, private consumption, investment and exports have a negative effect on crime in the long run.

James (2016) describe that energy explosion has affected regional crime rates throughout the country. There are positive effects on rates of various property and violent crimes in shale –rich countries. Rise in crime rates was caused by demographic shifts or rising population that reduced law implementation.

Cortes *et al.* (2016) explored that the crash down of Ponzi Schemes in 2008 in Colombia as a natural experiment to estimate the causal effect of a financial-crisis ambitious economic shock on subnational criminal results. The Failure of the structures affected hundreds of thousands of investors who lost millions of dollars, making the episode under study one of the largest Ponzi crisis of recent history.

Sloan (2016) study tells about the impact of various powerful crimes on restaurant location decisions in a single city, Memphis, T.N. Each crime is positively connected to the number of new restaurants in a package. But, even with the crime problem, these locations provide sufficient benefits, Perhaps population density, which makes them too attractive to restaurant entrepreneurs occurrence of crimes.

Rios (2016) finds crime and violence impact growth via changes in economic factor increase, i.e. reducing labor supply or increasing capital costs. Homicides rates increase by more than 22.5%, and gang-related violence increases by 5.4%. An increase of 9.8% in the number of criminal organizations is enough to eliminate one economic sector. This study

show that increases in criminal attendance and violent crime reduce economic divarication, increased sector attentiveness, and diminished economic difficulty.

Sharkey (2016) used longitudinal data and an array of empirical methods this study assessed strong evidence that the level of powerful crime in a country has a causal effect on the level of increasing economic mobility amongst individuals raised in families. Exploratory evidence suggested that violent crime may increase the prevalence of high school dropout.

Ghani (2017) finds that Urbanization has created various social problems, among which is crime that became a collective portent to all urban areas in both developed and developing nations. Crime increase in many parts of the world along with the unemployment and poverty. Nature of crime is not uniform but varies from one physical region to another. Crime is not a single factor; there are unequal factors that encouragement criminal activities.

Libois *et al.* (2018) studied the link between a household's fertility choices and deviations in their size and structure. The results exposed that number number of children affects from household size in an unforeseen manner. Increasing the household size or having more children would straightpay to a household's poverty.

3 Materials and methods

This section is encompassed in such a way to investigate the data related substances to emerge the study objectives through calculation and approximation of the considered data along with examining and discussion the results. It does also include area of study, reasons of study, exploration new techniques, research variables, and recognitions method and model collection for desire results. Furthermore this study analysis technique to achieve research objectives and research questions.

3.1 Area of study

The study area that is focused in this study is Province Punjab. This study is about crime and economic conditions in Punjab which cover

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time period from 1984-2015. In Pakistan most of research on crime focused overall Pakistan but in province level there is no study. That is the reason for selection of this area to check how different variables effects crime in Punjab.

4 Theoretical framework

One of the oldest theories of criminal behavior is the rational choice theory, which was first developed in the late 18th century and, since then, has been expanded on in many different ways. As other theories about criminal behavior have developed, they have been linked to the idea of rational choice and have created a broader interpretation of what rational choice means.

According to Nobel Prize-winning economist Gary Becker(1968) rational choice theory is used in both criminal and non-criminal behaviour. It involves intentionally committing some act because the reward gained from that act will be greater than the risk associated with it.

This theory rules out such factors as biological, psychological or environmental factors that might force someone to commit a crime. Instead, it asserts that criminals make a choice to commit a crime after weighing the costs. They also will consider the benefit of not committing the crime, but ultimately determine that the rewards of the crime are greater than the benefit of not committing the crime. From review considering Gillani and Lochner work we build a model in which the following determinates of crime are taken.

Crime=f (unemployment rate, Male Dropout ratio, Female Dropout ratio, Household size, urbanization)

In the above model both pure economic and socioeconomic determinants of crimes are considered. First variable is used unemployment rate and it is observed that if the person is unemployed then he must adopt some other ways to get money. Moreover, for an unemployed person, the opportunity cost of committing a crime is also low, which may force him to be involved in illegal activities. Thus, unemployment may have positive effect on crimes . Next variables are used male and female drop out ratio. Many children cannot complete their high school even primary education. Then they involve in criminal activities. Education can reduce

the crimes through wages. Basically education is the source for raising wage of a person. Lochner (2007) argued that education has two possible ways to reduce crimes. First way is that good education increases the opportunity cost of crimes because criminal needs time for committing crime and that time cannot be used in other productive purposes like legal work because high education confirms the better job opportunities in legal sector. Second is the time wastage of criminal for being in custody or in jail. This cost is very high for criminal because he can raise his income by spending his time in other ways. Large Household or more children increase the consumption level and these phenomena create high poverty level (Libois 2018). Urbanization also effect crime rate. People don't have jobs opportunities in rural areas so people move to cities. Unplanned urbanization may contribute to crime, and since urbanization in Pakistan is unplanned (Arif 2003).

4.1 Data Sources

Variables data used from various surveys, reports and articles. Data of all reported crimes are taken from Punjab Development Statistics. Data on unemployment are taken from Pakistan Bureau of Statistics. Male dropout and female dropout data are collected from Pakistan Bureau of Statistics. Data for Household size are taken from Household integrated economic survey (HIES) and data for urbanization are taken from Labour force survey and Pakistan Bureau of Statistics.

5 Empirical framework

Error Correction model and Granger causality use for the final results. They data type use is secondary and data period is from 1984 to 2015. Here check the adjustment of variables short run towards long run and how they affect crime. All reported crime use as a dependent variable and unemployment rate, female dropout, male dropout, household size and urbanization use as independent variables.

For check the relationship among variables used Granger Causality and Vector Error Correction Model (VECM) model use. According to Gillani (2009) for check the nexus unemployment, poverty, inflation and crime used causality and cointegration. Guzman (2015) checks the crime effects

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on Mexican economy Vector Error Correction Model (VECM), Augmented Dickey Fuller use. Habib Ullah and Law(2010) work on Property crime and macroeconomic variables in Malaysia by using Vector Error Correction Model (VECM) and Augmented Dickey Fuller use and results shows positive effect.

5.1 Analytical Model

The dependent variable set in the study is crime ratio; all reported crime ratio are taken in whole work. Unemployment rate (U) is simply the number of unemployed person out of total labour force. Male and female drop out refers percentage of students failing to complete a particular school or any institution course.

$$C = \beta_1 + \beta_2 U + \beta_3 MDR + \beta_4 FDR + \beta_5 HHS + \beta_6 UR + \mu_i \quad (1)$$

C= All Reported Crimes

β_1 = Constant

U= Unemployment rate

MDR= Male Dropout Ratio

FDR= Female Dropout Ratio

HHS= Household Size

UR=Urbanization

μ_i =Error term

In the above model, crime is used as a dependent variable. Unemployment rate, Male and female dropout ratio, Household size and urbanization are used as an independent variable. β 's shows coefficient and μ_i error term. The co-integration test is performed in two steps: first, a single series is tested to achieve a common integration sequence. If the series is the same order, which would mean synergistic integration. Using the Augmented Dickey Fuller (ADF) test, stationary series for testing. The ADF test is a standard unit root test; it analyses the order in which the data sequences are integrated.

5.2 ADF Unit Root Test

Augmented Dickey Fuller (ADF) test used for check the stationarity when data is time series. In this thesis used the Augmented

Dickey Fuller test. Augmented Dickey Fuller is a test of Unit Root for time series data.

Following are the form of ADF test equations.

$$\Delta y = \alpha_0 + \gamma y_{t-1} + \sum_{i=1}^p \beta \Delta y_{t-i} - 1 + \mu_t$$

$$\Delta y = \alpha_0 + \gamma y_{t-1} + \alpha_2 t + \sum_{i=1}^p \beta \Delta y_{t-i} - 1 + \mu_t$$

μ is an error term and this error term is white noise.

Dickey and Fuller in 1977 provide augmented dickey fuller(adf) test and deliver accumulative distribution of augmented dickey fuller test statistics by showing if calculated value is less than critical value of adf then y is stationary.as error term is improbable to white noise dickey and fuller extend their test results and comprise the additional lag term of dependent variable in order to exclude autocorrelation.

This test is not committed for small data because of its power and size. Adf provide wrong direction when data set is so small, in sometimes it reject null-hypothesis when its true and accept when it is incorrect. power and size properties problem solve through two new tests ,dickey fuller generalized least square (dfgls) and ng-perron tests.

5.3 Johansen Cointegration Analysis

Johansen-co-integration shows the degree of association among variables.it shows the long term relationship between two or more than two variables.Co-integration used for any econometric model that is non-stationary time series. Co-integration occurs when calculated when calculated statistics values are significantly different to zero. If all variables stationary at 1st difference then Johansen co-integration apply.

5.4 Vector Error Correction Model (VECM)

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A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be cointegrated. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The vector error correction (VEC) model is just a special case of the VAR for variables that are stationary in their differences $I(1)$. The VEC can also take into account any cointegration relationships among the variables.

VECM used when following conditions occur

- (1) the time series are not stationary in their levels but are in their differences
- (2) the variables are cointegrated.

An error correction model belongs to a category of multiple time series models most commonly used for data where the underlying variables have a long-run stochastic trend, also known as cointegration.

5.5 Results and Discussion

In this section comprise the data results. This section is significant judgment of investigator the struggle is based on secondary data. In the first step of thesis is descriptive statistics, in second step Augmented Dickey Fuller (ADF) test apply for stationarity, third step for Cointegration which tells association among variables then Vector Error Correction (VECM) and Granger Causality used for short run and long results.

Crime is dependent variable and Unemployment, Male dropout, Female dropout, Urbanization, Household size use as a independent variables to check how much crime affected by these variables.

Table 5.1: Descriptive Statistics

	Reported crime	Drop female	Drop male	HH size	Unemploy ment	Urban
Mean	3.30091	1.6281	0.8911	6.19468	0.32707063	16.048

	7	25	25	8		13
Median	3.30092	1.8000	0.7500	6.26500	0.242500	16.510
	1	00	00			00
Maximum	3.30427	2.1400	3.4300	7.58000	1.750000	18.740
	5	00	00	0		00
Minimum	3.29754	0.0900	0.0600	5.01000	0.023000	12.230
	2	00	00	0		00
Std.Dev.	0.00203	0.5305	0.6808	0.59053	0.395031	2.2368
	8	96	41	1		13
Skewness	.000552	.20646	2.1257	.013769	2.825447	.05603
	5	09	80	3		76
Kurtosis	1.79769	6.1507	8.0435	3.61161	10.22894	1.8512
	5	14	03	6		87
Jarque-Bera	1.92754	2.0540	1.0169	0.59972	2.509080	3.4036
	3	8	1	0		68
Probability	0.38145	0.0000	0.0000	0.74409	0.000000	0.1823
	2	00	00	22		49
Observations	32	32	32	32	32	32

Source: Author's calculation using Eviews software 9.

5.6. Interpretation of Descriptive Statistics

Finally, the behavior of unemployment rate is given in the table no 5.1. The average unemployment in during 1984 to 2015 is 8.58 which is a double digit rate. However, there are very high and very low unemployment rates in Pakistan as well. Probability value of all variables are greater than 0.05 which normal distribution of data. The highest Similarly, lowest unemployment which observed very low in Pakistan. The value of skewness suggests that distribution of crime is positively skewed; with leptokurtic distribution as value of kurtosis is greater than 3. It means that distribution of urbanization is sharper than normal distribution, which is also reflected in the significant value of Jarque Bera test.

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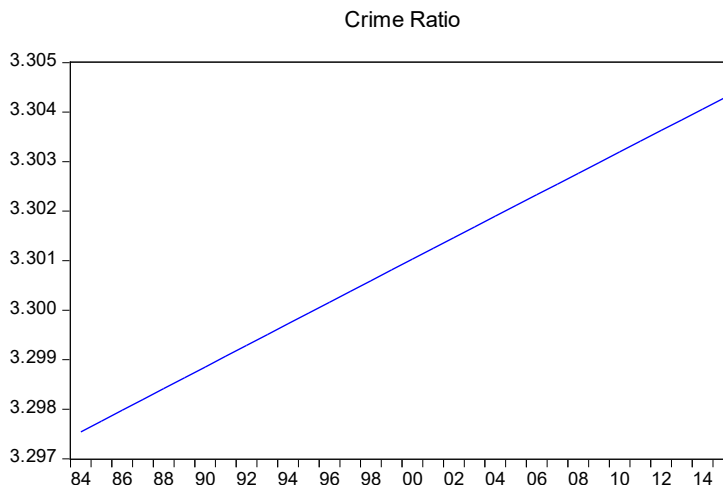


Figure 5.1 Crime Ratio

The figure shows that crime rate increase as with year increase. straight line shows direct relation in which at every level crime rates growing up.

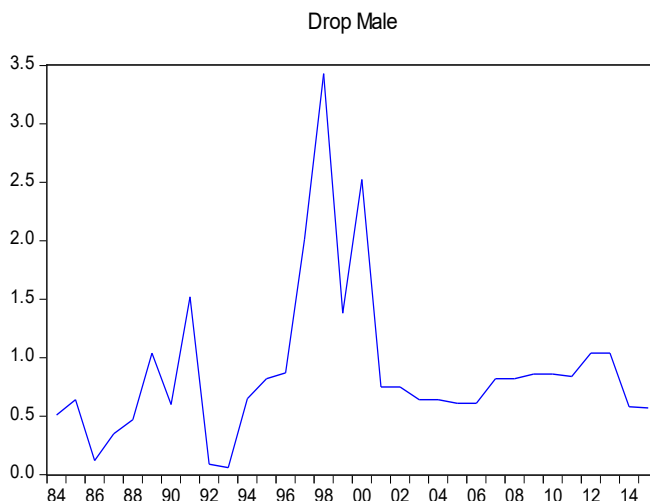


Figure 5.2 Dropout Male

The figure shows male dropout ratio. this diagram showing trend in dropout ratio. Male dropout reached 0.5 percent after that 3.0 and then decline. less male dropout ratio is a good sign.

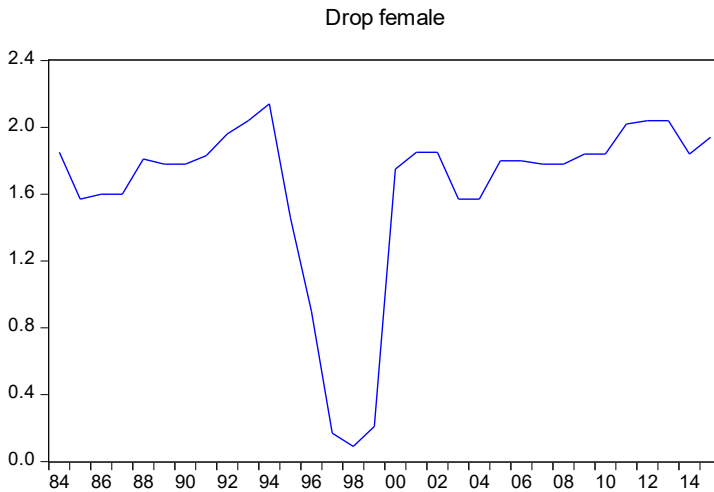


Figure 5.3 Dropout Female

The figure shows trend in dropout female which describes that dropout rate reached at 2.0 percent. Female dropout rate is high than male dropout. according to National womens Law Center ,A US research finds that girls are dropping out of high school greater than boys which have greater economic cost.

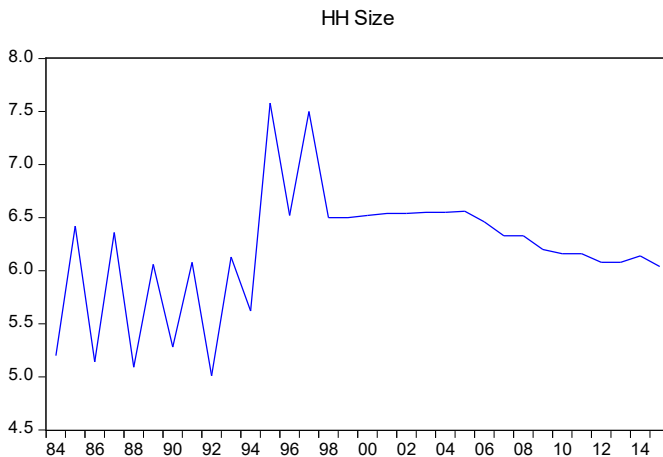


Figure 5.4 Household Size

This figure shows household size trend. As per years increase household size increase. but as we see after some time this size become low it may be due to some awareness because low household size bring low

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consumption and expenditures which is a good sign for prosperity in family.

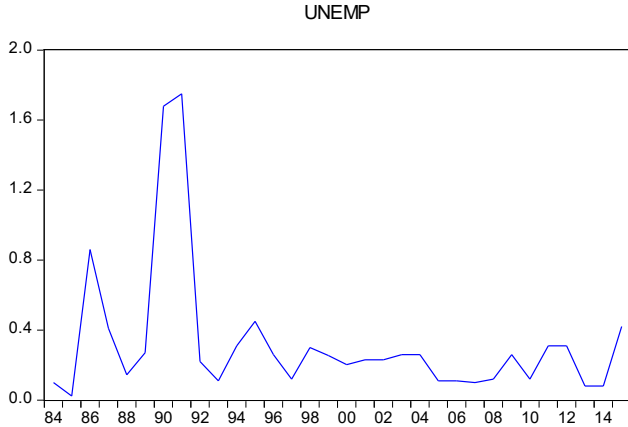


Figure 5.5 Unemployment

This diagram shows unemployment trend.as years increase unemployment level increase.High unemployment brings high crime rates which affects society and economy badly.

5.7 Estimation of Econometric Model

Table 5.2 Stationary Tests (Agumented Dickey Fuller (Adf))

VARIABLE	At level		AT FIRST DIFFERENCE	
	T statistic	- P-value	T -statistic	P-value
Reported crime	-2.788898	0.0096	-2.7865498	0.0218
Dropout female	-2.788898	0.0718	-4.522299	0.0013
Dropout male	-3.437961	0.0171	-8.687813	0.0000

HH size	-	0.1696	-3.066017	0.0406
	2.330904			
Unemployment	-	0.0136	-7.681213	0.0000
	3.533526			
Urban	-	0.0288	-1.812375	0.3668
	3.228491			

Source: Author's calculation using Eviews software 9.

5.8. Interpretation of Augmented Dickey Fuller test

The table 5.2 summarizes the results of the ADF tests at the level and first differences of all variables, including all possible options, i.e. constants. One of the purposes of Table 5.2 is to use more robust estimation techniques to confirm the results of symmetric analysis. The effectiveness of the ADF test depends on the appropriate hysteresis length selection and the appropriate options, none, constant and both.

This Augmented Dickey Fuller(ADF) test explains variables are stationary or non-stationary. If data is non-stationary or stationary at second difference its difficult to understand which test apply and also data is not reliable. The data is stationary if ADF value is greater is smaller than critical value and ADF statistical and critical values are always negative. In this model all variables are stationary at first difference except two variables Urbanization and Household size ,they both stationary at level.

Table 5.3 Johansen Cointegration Results

Trace and Maximum Eigen Value Test

Unrestricted Co-integration Rank Test (Trace Test)				
Hypothesized		Trace	0.05 percent	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**

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None *	0.999999	600.1552	95.75366	0.0001
At most 1 *	0.912496	183.0971	69.81889	0.0000
At most 2 *	0.803822	110.0150	47.85613	0.0000
At most 3 *	0.661201	61.15294	29.79707	0.0000
At most 4 *	0.462329	28.68253	15.49471	0.0003
At most 5 *	0.285073	10.06726	3.841466	0.0015

Unrestricted Co-integration Rank Test (Maximum Eigen value Test)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 percent Critical Value	Prob.**
None *	0.999999	417.0581	40.07757	0.0001
At most 1 *	0.912496	73.08208	33.87687	0.0000
At most 2 *	0.803822	48.86204	27.58434	0.0000
At most 3 *	0.661201	32.47042	21.13162	0.0009
At most 4 *	0.462329	18.61526	14.26460	0.0096
At most 5 *	0.285073	10.06726	3.841466	0.0015

Source: Author's calculation using Eviewssoftware 9.

5.9. Interpretation of Johansen Co-integration trace And maximum eigen value

The above table shows cointegration results. Cointegration results show the degree of association between variables. P value of co integration test is 0.0001 which is less than 0.005 its mean all independent variables have association with dependent variable. It tells that variables have long run association. When all variables are co integrated then we apply Vector Error Correction Model (VECM) which tells equilibrium adjustment towards short run to long run.

Table 5.4 Vector Error Correction (Vecm) Model

Variables	coefficient	Std.error	T-Statistic
D(Drop-Female(1))	0.612870	0.09424	6.50354
D(Drop-Male(-1))	0.041669	0.08777	0.47475
D(HH-Size(-1))	0.036592	0.10646	0.34373
D(UNEMP(-1))	0.113866	0.06554	1.73732
D(URBAN (-1))	0.226789	0.11544	1.96454
VECM Value	-0.855142	0.22971	3.72274
R.Squared	0.949017	Mean	0.011724
		Dependent Variable	
Adjusted R.Squared	0.916029	S.D dependent variable	0.378258
F-Statistics	28.76792	Akaike info Criterion	-1.290257

Source: Author's calculation using Eviews software 9.

5.10. Interpretation of Vector Error Correction Model (Vecm)

Table 5.4 represents Vector Error Correction Model (VECM). It contains short run effects of different variables on log of reported crime. If VECM term is negative, then it means that there exists short run disequilibrium in the model which reverts back to equilibrium level in the model. It shows that if there is any short run disequilibrium in the model, 85 percent restores back to equilibrium in the current year.

All the variables reported crime, dropout female, dropout male and urban have correct theoretical signs. Starting with the one and two years lag effects of dropout ratio on current reported crime. It means that if reported crime increases this years, it will falls in next year.

Economic theory states that there is positive relationship between reported crime and dropout ratio. The negative effect at lag one is not observed in economic theory. There are also possitive effects of households saving on reported crime in Pakistan, which is also theoretically correct sign. In theory, unemployment is have possitive effects on reported crime.

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Table 5.5 Granger Causality Test

Pairwise Granger Causality Tests

Date: 04/15/18 Time: 10:48

Sample: 1984 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DROP_FEMALE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause DROP_FEMALE		NA	NA
DROP_MALE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause DROP_MALE		NA	NA
HH_SIZE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause HH_SIZE		NA	NA
UNEMP does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause UNEMP		NA	NA
URBAN does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause URBAN		NA	NA
DROP_MALE does not Granger Cause DROP_FEMALE	32	6.64518	0.0048
DROP_FEMALE does not Granger Cause DROP_MALE		9.80335	0.0007

HH_SIZE	does	not	Granger	Cause	32	3.19844	0.0580	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	HH_SIZE	1.32630	0.2835	
UNEMP	does	not	Granger	Cause	32	0.18625	0.8312	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	UNEMP	0.21197	0.8104	
URBAN	does	not	Granger	Cause	32	0.35296	0.7061	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	URBAN	2.15300	0.1372	
HH_SIZE	does	not	Granger	Cause	32	2.57652	0.0961	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	HH_SIZE	1.93989	0.1647	
UNEMP	does	not	Granger	Cause	32	0.92120	0.4111	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	UNEMP	0.23120	0.7953	
URBAN	does	not	Granger	Cause	32	0.15108	0.8606	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	URBAN	0.83786	0.4444	
UNEMP	does	not	Granger	Cause	HH_SIZE	32	0.55068	0.5834
HH_SIZE	does	not	Granger	Cause	UNEMP	4.58629	0.0201	
URBAN	does	not	Granger	Cause	HH_SIZE	32	0.18933	0.8287
HH_SIZE	does	not	Granger	Cause	URBAN	2.64326	0.0909	
URBAN	does	not	Granger	Cause	UNEMP	32	4.85586	0.0165
UNEMP	does	not	Granger	Cause	URBAN	1.77964	0.1894	

Source: Author's calculation using Eviews software 9.

5.11. Interpretation of granger causality test

Dropout female does not cause granger causality. Crime ratio does not cause granger causality. Drop out male does not cause granger causality.

Household size does not cause granger causality. Unemployment does not cause granger causality cause. So all variables are unidirectional and have long run relationship.

6 CONCLUSION

“People respond to incentives” is a universal truth that allows us to claim that people participate in criminal activities for their own personal or economic incentives. Backer (1968) introduced the crime and economic discipline by designating criminals and law enforcement agencies as rational individuals. But unlikely crime rate increase day by day but economics of crime have received a little attention. The higher rate of crime increases insecurity, frustration and mental unrest. The study has found significance relationship between crime and economic condition and this study also covers some real implications. The results showing greate positive results between unemployment, male and female dropout, urbanization and household size affect crime ratio in Province Punjab. According to results decreasing the number of dropout directly link with low crime rate in Punjab.

However different other variables also effects crime or increase crime in Punjab. Urbanization and household size effects crime ratio in Punjab. The trend analysis shows that political instability, institutional corruption, unemployment, education and employment policies are the main factors of high crime rates in Province Punjab.

If Government provides more jobs to individuals or establish Rozi schemes it will more decrease unemployment and less unemployment means high enrollment in schools which prevent dropout ratio and also decrease the crime level. This thing is very important because today without a high school diploma an individual’s chance for better life become slow.

There is lack of planning of urbanization. As hundred years ago Marshall (1920) identified the benefits of urbanization like knowledge spillover because of cluster of highly skilled workers. Similarly labour market pooling and specialized suppliers. These are all the benefits of urbanization. But in case of Punjab urbanization causes more crimes. So the reason behind is the unplanned urbanization in Punjab. Because of this

lack of planning resources become scarce, land shortage problem and environmental degradation occur which motivate people towards crimes. Urbanization also increases many problems in society ,like inadequate infrastructure, lack of affordable housing, pollution ,poverty and crime rate. Government should take steps to solve this problem. Govt should provide employment opportunities near rural areas so urbanization must be controlled.

A large Household size brings many problems, in which crime must be considered. A large number of peoples in house mean high consumption, less saving and more part of income used. This size also creates crime, because when people don't have rupees to fulfill their needs they started crime as a short cut way of income.

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