PhD Thesis on

REVISITING THE RATIONAL ACTOR MODEL OF CRIME: A THEORETICAL AND EMPIRICAL SUPPLEMENT FROM KP, PAKISTAN

Submitted By **Ikram Ullah**
05/PhD/PIDE/2011

Advisor: **Dr. M. Idrees Khawaja**
Associate Professor, PIDE

Co-Advisor: **Dr. Nasir Iqbal**
Associate Professor, PIDE

Department of Economics
Pakistan Institute of Development Economics (PIDE),
Islamabad

2018

Author's Declaration

I Mr. Ikram Ullah hereby state that my PhD thesis titled **"Revisiting the Rational Actor Model of Crime: A Theoretical and Empirical Supplement from KP, Pakistan"** is my own work and has not been submitted previously by me for taking any degree from **Pakistan Institute of Development Economics, Islamabad'** or anywhere else in the country/world.

At any time if my statement is found to be incorrect even after my Graduation the university has the right to withdraw my PhD degree.

Mr. Ikram Ullah

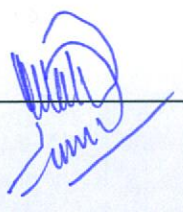
05/PhD/PIDE/2011

Plagiarism Undertaking

I solemnly declare that research work presented in the thesis titled **"Revisiting the Rational Actor Model of Crime: A Theoretical and Empirical Supplement from KP, Pakistan"** is solely my research work with no significant contribution from any other person. Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me.

I understand the zero tolerance policy of the **HEC** and **Pakistan Institute of Development Economics, Islamabad** towards plagiarism. Therefore I as an Author of the above titled thesis declare that no portion of my thesis has been plagiarized and any material used as reference is properly cited.

I undertake that if I am found guilty of any formal plagiarism in the above titled thesis even after award of PhD degree, the University reserves the rights to withdraw/revoke my PhD degree and that HEC and the University has the right to publish my name on the HEC/University Website on which names of students are placed who submitted plagiarized thesis.

Students/Author Signature: 

Name: Mr. Ikram Ullah

05/PhD/PIDE/2011

Certificate of Approval

This is to certify that the research work presented in this thesis, entitled: **"Revisiting the Rational Actor Model of Crime: A Theoretical and Empirical Supplement from KP, Pakistan"** was conducted by Mr. Ikram Ullah under the supervision of Dr. M. Idrees Khawaja and Dr. Nasir Iqbal. No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics from **Pakistan Institute of Development Economics, Islamabad.**

Student Name: Mr. Ikram Ullah
05/PhD/PIDE/2011

Signature: _____

Examination Committee:

a) **External Examiner: Dr. Muhammad Arshad Khan**
Associate Professor
Department of Management Sciences
COMSATS Institute of Information Technology
Islamabad

Signature: _____

b) **Internal Examiner: Dr. Faiz ur Rehman**
Assistant Professor
Quaid-i-Azam University,
Islamabad

Signature: _____

Supervisor: Dr. M. Idrees Khawaja
Dean, Air University School of Management
Islamabad

Signature: _____

Co-Supervisor: Dr. Nasir Iqbal
Associate Professor
PIDE, Islamabad

Signature: _____

Dr. Attiya Y. Javid
Professor/Head, Department of Economics
PIDE, Islamabad

Signature: _____

Acknowledgements

All glory is to Allah, the creator of all creatures, who is Omnipotent, Omnipresent and the source of all knowledge and wisdom. All praises to Almighty Allah, the most beneficent and merciful, who surely has the power and absolute control over everything. Who gives us the power to do, the sight to observe and the mind to think and judge, and by mercy of Allah I was able to complete my thesis.

I was lucky, and no doubt it is a great honor for me, to become research student of Dr. Muhammad Idrees Khawaja and Dr. Nasir Iqbal. Their highly technical skilled knowledge, meaningful suggestion, insightful comments helped me on my approach to this work right from planning to its execution. Through their unique guidance, encouragement and moral support I touch the feet of success to submit my thesis. I have no words to express my gratitude to these great teachers. I will never forget their polite and friendly behavior. They are being a true inspiration for me in the field of Economics and particularly in the field of Behavioral Economics. Their consistent guidance at every step makes it possible for me to complete this research in time. I genuinely feel that without their sincere and ever available help, completion of this thesis will not have been possible.

I am very thankful to Dr. Muslih ud Din, Dr. Ather Maqsood, Dr. Ijaz Ghani, Dr. Waseem Shahid Malik, Dr. Fazal Mehmood and Dr. Etzaz Ahmad who taught me during the course work and their lessons helped me a lot in writing my thesis.

I am very grateful to HEC for providing necessary funding under TRGP scheme. I am also very pleased to the survey team: Irshad Muhammad, Jawad Khan, Muhammad Anas, and Subhan Ullah with special efforts from Yousaf Shah and Zakir Ullah. Besides these I am appreciative to Ilyas Muhammad, Najmus Saqib, Atta Ullah, Hamad Zamir and Gul Arzo for help in data collection. I am relieved to Khadim Ullah, Saqib Ahmad, Shakil Ahmad, Adalt Khan, Abdul Qadeer, Muhammad Azhar, Shahab Alam, Muhammad Zada, Muhammad Saqib, Syed Yawar Ali, Muhammad Zeeshan Ibrahim and Abdullah who helped me in data entry.

I am gratified to the two jail superintendents who helped a lot and provided lists of ex-inmates and also to Police special branch officers Haidar Zaman Khan, Habib, Fazal Wadud, and Suleman for their help. SHO's who helped in the identification of addresses and contact numbers of Ex-inmates are also appreciative. I am grateful to some of the faculty members from other universities who helped the survey teams: Muhammad Farooq, Department of Statistics, University of Peshawar,

Dr. Wajid khan, Department of Management Studies, Muhammad Asaf Khan, Department of Management Studies, Abdul Wali Khan University Mardan and Mr.Muhammad Asghar Khan, Department of sociology, University of Swat.

At the end, I am also grateful to Paolo Vanin and Filippo Belloc - the two external reviewers – and Dr. Muhammad Arshad Khan whose deep insights and critical comments helped me improve the thesis a lot.

Ikram Ullah

Abstract

The number and intensity of crimes in our society is increasing at such a rate that many small non-serious crimes are considered normal. Our minds -individually and collectively- are occupied by two types of thought process at each point in time. First, every one of us thinks and plans (legally or illegally) about how to get rich. The second thought that occupies our minds is how to safeguard ourselves and our belongings from being targeted by the criminals. The current research endeavor is an effort to understand the increasing trends of both of our concerns that have deep rooted connections with our personal, social and economic life.

The study of crime in economics is not new. The principles of economics have been utilized to understand crime even before Adam Smith, but it was Becker (1968) who popularized the economist's tool-kit for explaining crime. The economist's tool-kit that developed after Becker considers the cost-benefit calculus of individuals contemplating to commit a criminal act as the most important element that can be manipulated -through the criminal justice system- to control crime and criminality in the society. The economists' tool-kit however, by focusing on the criminal justice system variables, ignores other important influences such as individual differences, social structures and the structure of opportunities and setbacks faced by the individuals. While being within the scope of economics, this study argues that besides the criminal justice system variables, individual differences, social influences and the structure of opportunities and setbacks all are relevant factors for understanding crime and criminality.

The theoretical arguments developed in this study are empirically tested by using three different and purposively collected data sets from Khyber Pakhtunkhwa, Pakistan. The first data set is collected from university level students (n = 457) and is utilized for understanding crimes such as academic dishonesty, campus crimes and other relevant crimes. The second data set is collected from ex-prisoners (n = 325) of the Khyber Pakhtunkhwa jails and is utilized for evaluating crimes such as violent crimes, property crimes and other crimes prevailing in this sub-sample. The third and final data set consists of university employees (n = 405) where relevant information on white-collar crimes, academic dishonesty and other related crimes are collected.

The three data sets are analyzed using principle component and regression analysis most suited to the estimation of a count dependent variable. Besides Poisson and Negative Binomial regression models, the study also estimate and report results of ordinary least square regressions which serves

to check robustness of the results. The results obtained from regression analyses are generally supportive of the theoretical implications of the model. More precisely, the results obtained from the regression analysis of the students' sample reveals that personal morality, human and social capital are important predictors of academic dishonesty and other campus related crimes. Deterrence variables (both social and legal) are however found to have no influence on the crimes considered for the students' sample. In contrast to the students' sample, results of the ex-inmate's sample reveal that human and social capital and deterrence variables all are important predictors of crimes committed by this sub group, but personal morality has no influence. Similarly, in the university employees' sample, it is found that legal sanctions, morality, human capital and social capital are important predictors of illegal behavior.

Results obtained from empirical analysis of the three sub-samples reveals that different crimes are sensitive to different sets of variables. Hence a one-size-fits-all approach for controlling crime in the country is not an appropriate policy. Rather controlling diverse crimes requires - besides a generic approach based on the criminal justice system - that policy needs to be tailored in accordance with the characteristics of crimes and the criminals.

LIST OF ABBREVIATIONS

ACJS	Awareness about the Criminal Justice System
ACS	Activity Scale
ARAM	Augmented Rational Actor Model
ATM	Automated Teller Machine
BMI	Business Monitor International
CCTV	Close Circuit Television
CHRI	Commonwealth Human Rights Initiative
CP	Central Prisons
CSIS	Center for Strategic and International Studies
DJ	District Jails
DS	Discrimination Scale
FATA	Federally Administered Tribal Area
FBR	Federal Board of Revenue
GDP	Gross Domestic Product
GoP	Government of Pakistan
GPI	Global Peace Index
GST	General Strain Theory
GTI	Global Terrorism Index
HC	Human Capital
HRCP	Human Rights Commission of Pakistan
ICG	International Crises Group
IDPs	Internally Displaced People
ISPU	Institute for Social Policy and Understanding
JJ	Johansen Co-Integration
JL	Judicial Lockups
KP	Khyber Pakhtunkhwa
MD	Marital Status
MS	Morality Scale
NCD	National Crime Data
OSAC	Overseas Security Advisory Council of the United States

PATA	Provincially Administered Tribal Area
PBS	Pakistan Bureau of Statistics
PE	Parents Education
PeeE	Perceived Anti-social behavior of Peers
PPD	Perceived Probability of Detection
PPLS	Perceived Probability of Legal Sanctions
PPPS	Perceived Probability of Personal Sanctions
PPSS	Perceived Probability of Social Sanctions
PS	Parenting Scale
PSLS	Perceived Severity of Legal Sanctions
PSPS	Perceived Severity of Personal Sanctions
PSSS	Perceived Severity of Social Sanctions
RP	Risk Preference
SAS	School Attachment and Quality Scale
SAT	Situational Action Theory
SBP	State Bank of Pakistan
SC	Social Capital
SES	Socio-economic Status
SJ	Sub Jails
TIP	Transparency International Pakistan
TP	Time Preference
U-C	Unemployment Crime Relationship
UNODC	United Nations Office on Drugs and Crime
USIP	United States Institute of Peace
VECM	Vector Error Correction Model
WPB	World Prison Brief

LIST OF FIGURES

LIST OF TABLES

CONTENTS

Chapter 01

Introduction

1.1 Background

For an economist, what should sound healthier than growth rates? Growth rates in macroeconomic indicators such as Gross Domestic Product (GDP), stock market prices and the likes are always cherished. There are, however, many macroeconomic indicators whose growth would grate many economists. Examples of such indicators are unemployment, inflation and the growing budget deficits. The worst of all these unpleasant growing indicators is the growing crime[1] rate which is a serious cause of concern for every member of the society. In a recent article, the Executive Director of the United Nations Office on Drugs and Crime (UNODC) commented as follows while referring to global crime;

"Out there is a gigantic threat to humanity, poorly understood, inadequately studied and as a consequence, ineffectively dealt with. There is a UN Convention against transnational organized crime; there is Interpol, regional intelligence-sharing centers, as well as national crime-fighting agencies. But frankly, we are chasing shadows: we do not really know what we are talking about" (Costa, 2010, p. 648).

Reports shows that the global economic impact of crime and violence is indeed substantial[2]. It is estimated that a 10 percent uniform reduction in crime and violence would generate a surplus equal to ten times the total development assistance from developed countries to under developed countries, and three times the overall incomes of the worlds' 1.1 billion extreme poor's (GPI, 2015).

There is no doubt that most people, if given a choice, would love to live in societies where compliance with laws and regulations is high. But the irony is that individuals rarely adhere to societal laws and institutional rules even at places where future leaders are trained. Perhaps societies without crime may not be imaginable but Pakistan is a special case in this regard. The country is being rated "critical" for terrorism, "critical" for political violence, and "high" for crime

[1] Any act by individuals or group that has injurious consequences for the society as a whole or for one or more people within it (Blackburn, 1993).

[2] According to Global Peace Index (2015) estimates, the world loses 13.4 percent of its GDP due to crime, which equals the combined GDP of UK, Germany, Canada, Brazil, France and Spain.

(OSAC, 2015). The average annual increase in the overall crime rate in Pakistan is 18 percent while that of crime against person and property is 24 percent (Anjum, 2013). There are more than five million drug addicts in the country and this number is increasing by 10 percent per annum (Khan, 2016). In international comparisons, Pakistan is ranked 6th in South Asia (only slightly better than Afghanistan) and 154th in world with respect to crime and violence. Pakistan is the 5th ranked highest militarizing country with the rate of growth in militarization only less than Syria and North Korea (4, 16 and 5 percent respectively). On domestic conflict domain, Pakistan is rated the least peaceful country of the world (GPI, 2015).

Besides violent and property crimes, white collar and other crimes in Pakistan have also reached serious levels. For instance, a recent study by Farroq (2017) reports the underground economy of Pakistan to be 41 percent of GDP and tax evasion to be 3.5 percent of GDP. The author further reports that in the year 2010-11, the Federal Board of Revenue (FBR) itself embezzled an amount of Rs. 500 billion. Similarly, although an ignored category of crimes, academic dishonesty in educational institutions is a deep-rooted problem with an ever-increasing trend (Nazir and Aslam, 2010). According to a 1941 estimate, around 23 percent of the students were involved in academic cheating whose number increased to 64 percent in 1964 and 76 percent in 1980 (Kisamore, Stone & Jawahar, 2007). More recent estimates suggest academic dishonesty to be even closer to 100 percent (see for example, Rehman & Waheed, 2004 & Sorgo et al., 2015).

Academic Dishonesty is usually considered a very minor crime but has serious consequences for the economy. At the very least, academic dishonesty threatens the reputation of honest students, teachers, education system and that of the whole nation (Thomas, 2017). Additionally, students who are involved in academic dishonesty deprive themselves of education and skills that may be critical in the job market (Passow et al., 2006; Reisig & Bain, 2016). Besides lack of critical skills, extant empirical research has proved that dishonest students carry over their dishonesty to the job market (Sorgo et al., 2015; Saana et al., 2016; Lin & Wen, 2007; Sim, 1993; Lawson, 2004). Thus, a dishonest academic environment cannot produce an honest work force which is the most important driver of economic development.

To cope with the ever-increasing rates of crime, governments at various levels (i.e. federal, provincial and local) are continually allocating huge amounts of money to ensure public order and safety in the country. According to a recent estimate (GPI, 2015), Pakistan spends $ 67503 million

annually to control crime and violence in the country (which amounts to 8 percent of GDP). Similarly, the Government of Khyber Pakhtunkhwa (KP) allocates at least 16 percent of its total budget to public order and safety each year (GoP, 2016). Worsening the matters is the fact that these costs are only part of a huge whole[3]. Crime, in a sense, is a tax on our life standards that imposes upon us both visible and non-visible costs (Welsh, Farrington & Sherman, 2001).

1.2 Motivation

Crime is costly, not only for the immediate victims, but for all of us. The fear of voracious crimes adds to our concerns regarding our children. Every person of the society lives with a sense of vulnerability and can become a victim of criminality in any space or time. This naturally causes each person of the society to call for more visible actions, tougher laws and harsher penalties. The issue of crime and criminality is a serious one and requires thoughtful responses. A well thought-out and rational response to crime calls for a deeper understanding of the processes that leads to crime and criminality. Tougher laws and harsher penalties may be part of the tool kit, but it cannot be the total solution. To chalk out a comprehensive solution for the problem of crime and criminality in the country, we need to seek answers to the following set of core questions.

1. What prompts individuals to get involved in crime? Why do others never commit a crime, no matter how desperate their circumstances?
2. Do individuals think about the benefits and the risks when committing a crime? If yes, then why do some people commit crimes regardless of the consequences?
3. Why do certain individuals offend more frequently than others?
4. Why are certain areas more crime-prone than others?

The textbook answers to some of the above questions can be classified in three categories; the classical philosophy, the positivist school of thought and the critical criminology. The classical philosophy, associated with Beccaria (1764) and Bentham (1789), is based on the idea that each person possesses free will and is the master of his own fate. In this frame of reference, crime is the product of free and possibly rational choice of the individual who assess the cost and benefits of his action. A criminal act is preferred and chosen if the total payoff, net of expected cost of sanctions and others, is higher than that of legal alternatives (Becker, 1968; Ehrlich, 1973;

[3] The mentioned costs are criminal justice system costs of crime. To arrive at the total cost of crime, we will have to add victim costs, criminal career costs and intangible costs (McCollister, French & Fang, 2010)

Heineke, 1978). The problem then the public authorities are facing is to devise a criminal justice system that would increase the cost side and decreases the benefit side of the equation so that criminal activities are minimized (Void, Bernard & Snipes, 1998).

The positivist school, initially dominated by biologists and psychologists but later joined by sociologists, attacked the classical criminology by asserting that criminal acts are not freely and rationally chosen[4]. Rather individuals are predetermined for the sort of behavior they display. Rationalization, according to this view, is only used to justify the predetermined behavior. Positivist theories imply that criminal behavior is determined by factors beyond the control of an individual and hence punishment would not affect the behavior. Thus, the positivist school sought to identify various factors, biological, psychological, economic or social, that increase/decrease the probability of committing crimes. Once such factors are identified, it becomes easier to control crime by means other than punishment.

The failure of the positivist philosophy to control crime caused social thinkers to abandon the positivist ideology in the early 1970's and re-embraced the classical philosophy (the so-called neoclassical criminology) of punishment to control crime (e.g. Becker, 1968). However, there emerged a very new school of thought to whom many criminal behaviors are like legal ones and hence involve the same causal process. Thus, the real problem to investigate is not what characteristics differentiate criminals from non-criminal, the view held by the positivists, but rather why some people are labeled criminal while other non-criminal, despite displaying similar sets of behaviors. These criminologists therefore study the processes by which sets of people and actions are defined as criminal at particular times and places.

All these theories, considered in isolation, explain crime only partially and generate more questions than answers. For example, the positivist theories imply that criminals are different from non-criminal in some important respects, be that physical, biological, social or psychological. But this implication utterly violates the reality that even the hardest criminals display social and legal behavior most of the times. It seems that there are specific timings, characterized by lose social or legal control or availability of opportunities, that criminals are inclined to commit crimes (an observation that leads us to the value of classical and neo classical philosophy).

[4] A detailed, but not comprehensive, list of these theories is given in chapter 3.

Similarly, the classical philosophy of self-centered preferences implies that all individuals are inclined to immoral and unsocial behavior if left uncontrolled. But if all the population is subject to the same law, then why some people obey the law and other violates, irrespective of the consequences? Again, this is an observation that leads us to accepting one of the two alternative theories; that is either criminal and non-criminal are different from each other or the law is written such that certain quarters of the society are inevitable to disobey. Thus, none of the philosophy, on its own, provides us a complete tool kit to tackle the problem of crime and criminality. What we need is to search for an integrated approach that answers most of the above core questions.

Theoretical understanding is necessary to guide empirical work. As mentioned in the preceding paragraph, existing theory guides us partially to understand crime. This deficiency is also reflected in the empirical endeavor. Deficiencies in the empirical studies are detailed in chapter 3 but two recent articles needs a mention as representative. The first study is by Loughran et al. (2016) which Pickett & Roche (2016) claims to be the most comprehensive study based on the rational actor model to date. The second study by Jabbar & Mohsin (2014) relates to Pakistan and the author claims the study to be the most comprehensive in Pakistan. Both studies, although comprehensive in their own respects, have multiple shortcomings. For example, Loughran et al. (2016) estimates the empirical equation using the Poisson regression despite the fact their dependent variable was over-dispersed. The study by Jabbar & Mohsin (2014) have multiple problems. First, the study use "police strength" as one of the deterrence variables but its use has been historically criticized for being influenced by the crime rate itself (i.e. bidirectional causality). Second, the study considers only one type of crime (murder) to avoid the criticism of lumping together distinctly different crime (as is the case with overall reported crime rates). But their discussion that different crimes are motivated by different sets of factors unnecessarily reduces the scope of the economics model of crime. No economics model of crime to-date says anything regarding differing motivations for different crimes. Moreover, if the authors are correct in this (as many criminologists from sociology background would suggest), then murder would be the last crime sensitive to economists' tool kit. Numerous studies have reported that murder is the least sensitive of the crimes to economic variables (e.g. see Ehrlich, 1973). Moreover, the study also misses out to include some important explanatory variables such as income and may have mis-specification issues. Similarly, the study also fails to shed light on which of the two effects on unemployment are dominant in their study. That is, no effort in the empirical specification is made to isolate the motivational effect

from the opportunity effect. Thus, there is a dire need to develop an integrated theory and test it with the most appropriate data so that policy research is carried out in the right direction. To fulfill both needs, the current study is designed to achieve the following objectives.

1.3 Objectives

1. To augment the rational actor model with differing individual's human capital and morality, social capital and opportunities/setbacks.
2. To test the implications of the derived model with data and identify various individual, societal, and policy level variables that sensitize;
    a. University level students to participate in academic dishonesty, campus crimes and other crimes
    b. University employees to participate in white-collar crimes, academic dishonesty and other crimes
    c. Ex-inmates to participate in violent, property and other crimes.

1.4 Significance

There is no dearth of theoretical and empirical research on the economics of crime, but the existing literature lacks rigor in certain important areas. For instance, most of the previous theoretical literature consider the criminal justice system variables as the core of the subject, ignoring important individual and societal level variables. Similarly, empirical studies based on the economist's models of crime are mostly estimated using aggregate and police compiled data with several undesirable consequences. This study attempts to contribute to the existing literature by covering both the mentioned deficiencies.

To the best of my knowledge, this would be the first study to incorporate the effects of differing human and social capital, morality and opportunities in a single rational actor model. The model would then be tested with survey data to evaluate the comparative static implications of the model. Most of the existing studies, internationally or within Pakistan, utilize aggregate and published data with several undesirable consequences[5]. Many advantages can be identified that are associated with estimating a model of crime with individual level data. For example, it is always recommended to study behavior with individual level data (Ehrlich, 1996). Using individual level

[5] Even the pioneers in this field recognizes these deficiencies and recommend the use of individual level data to overcome these (e.g. Ehrlich, 1996)

data is recommended for avoiding issues created by "dark numbers" in police statistics and the presumed symmetry between subjective and objective arrest risks. Moreover, in individual level data, statistical identifications of the relationships are not an issue, and one is reasonably assured that probabilities of arrest and punishment are independent of individual's actions (Eide, Rubin & Shepherd, 2006). Thus, the study is expected to be a valuable addition to the existing theoretical and empirical literature in the field.

1.5 Data and Methodology

To empirically test the implications of the derived model, the study takes Khyber Pakhtunkhwa (KP), Pakistan as the case study. In terms of crimes and terrorism, KP is no doubt the hardest hit province of the country which makes it an ideal case for carrying out the current study. The study utilizes a well-designed and pretested questionnaire to collect primary data from university level students, employees and ex-inmates in the province. Using the criteria suggested by Cochrane (1977) for optimal sample size selection, the sample size for the study is 1500 individuals. The optimal sample size is then equally divided between the three sub-populations and the desired number of respondents is subsequently selected based on the principles of convenience/voluntary response.

Considering the settings and opportunities of each sub-samples to commit specific crimes, the study collected data on academic dishonesty, campus crimes and other student related crimes from the student's sample, white-collar crimes, academic dishonesty and other employees related crimes from the university employees' sample, and violent crimes, property crimes and other street crimes from the ex-inmate's sample. The collected data is then fed into Statistical Package for Social Sciences (SPSS) and subsequently analyzed making extensive use of the principle component analysis and various regression techniques. Since the dependent variables (counts of self-reported crimes committed by the i^{th} individual in the j^{th} sample) are counts in most cases (except where these are normalized), the core regression analyses of the study are based on Poisson regression and Binomial/Negative binomial regression models.

1.6 Organization of the Thesis

The rest of the thesis are organized in six chapters. Chapter 02 is descriptive in nature and serve two purposes. First, the chapter utilize time series data to outline crime trends in Pakistan and KP, with a view to get an idea about whether reported crime rates are increasing or decreasing over the

years. Second, the chapter briefly discuss the characteristics of the Criminal Justice System (CJS), a chartered and only agency of controlling crime, in Pakistan and KP. Chapter 03 reviews theoretical and empirical literature on crime causation. The chapter briefly outlines theories other than the rational actor model and mainly focuses on the theoretical underpinnings of the rational actor model and the empirical studies enticed by the model.

Chapter 04 develops the theoretical framework of the study. The chapter develops the Augmented Rational Actor Model (ARAM) and discusses how each variable of the model influences participation in illegitimate activities. The chapter also contains a contrast of the basic tenants of ARAM with other competing explanation of criminal decision making. Chapter 05 outlines data and methodology that is used to validate the theoretical implications of the model. Chapter 06 is the crux of the study where empirical findings are presented and discussed. The chapter is divided in three parts; analysis of students' data, analysis of employee's data and analysis of the (known) offender's data. Chapter 07 concludes the study and highlight the key policy recommendations stemming from the empirical analysis. This chapter also discuss some of the key limitations of the study.

Chapter 02

Crime and the Criminal Justice System in KP-Pakistan

2.1 Introduction

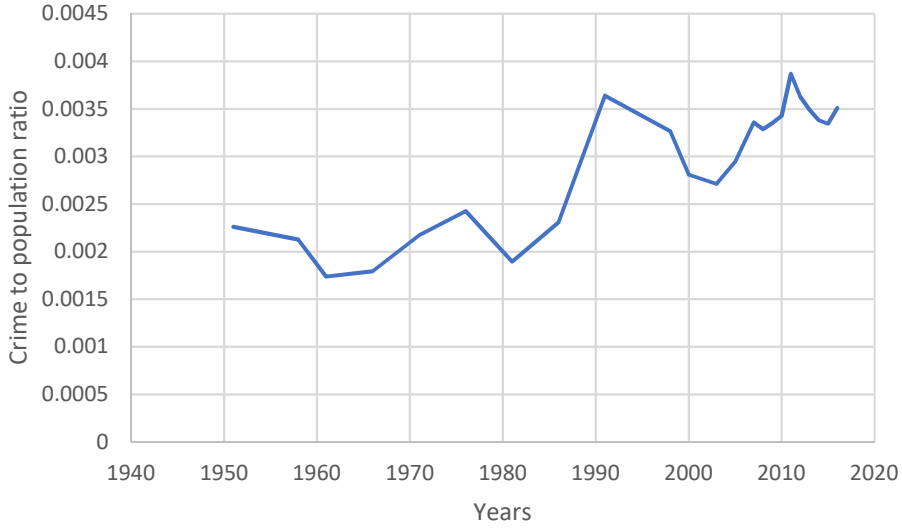
This chapter is a stand-alone chapter which outlines the historical trends in crime and in the policy to control crime in KP and Pakistan. The rational actor model postulates that probability of detection and severity of punishment are the central variables that constitute the cost benefit calculations of individuals contemplating to commit crime. Consequently, as the model predicts, an ***efficient*** criminal justice system should suffice to control crime. In turn, rising crime rates may imply that either the core of the policy to control crime is beyond the scope of the CJS or that the CJS is inefficient. In effect, this chapter is an exposition of the severity of the problem (i.e. crime) and an implicit explanation for the potential causes behind the problem. The chapter is descriptive in nature and focuses on two purposes. First, the chapter utilize time series data to highlight crime trends in KP and Pakistan. This would shed light on whether reported crime rates are increasing or decreasing overtime. Second, the chapter briefly discusses the characteristics of the Criminal Justice System (CJS) in KP and Pakistan, being the only chartered agency for controlling crime in the country. Data from the province of Punjab is also utilized for the purposes of comparison with KP. The chapter is concluded with a brief discussion in which the expected future crime trends and the possible effects of the present characteristics of the CJS on the crime control policy in Pakistan are detailed.

2.2 Crime trends in Pakistan

Since independence, crime happened in Pakistan, but the rate of its growth was relatively stable. After the fall of Dhaka in 1971, crime rates in the country decreased until the Soviet-Afghan war of 1979. Since that period until the early 1990s, reported crime rates increased in the country at a very high rate. With the return of democracy in the early 1990s, the crime rates once again stabilized until 1998 and then the rate steadily decreased until 2003. A second surge in the reported crime rates occurred from 2003 to 2010, followed by a gradual decrease. Recently, the reported crimes are rising once again. Total reported crimes reached its all-time high of 677,554 in 2016 as compared to 633,299 in 2015. Thus, crimes grew at a rate of almost 7 percent from 2015 to 2016.

Figure 2.1 illustrates crime trend (reported crimes to papulation) in Pakistan between 1951 and 2016.

Figure 2.1 Reported crimes to Population ratio in Pakistan (1951-2016)



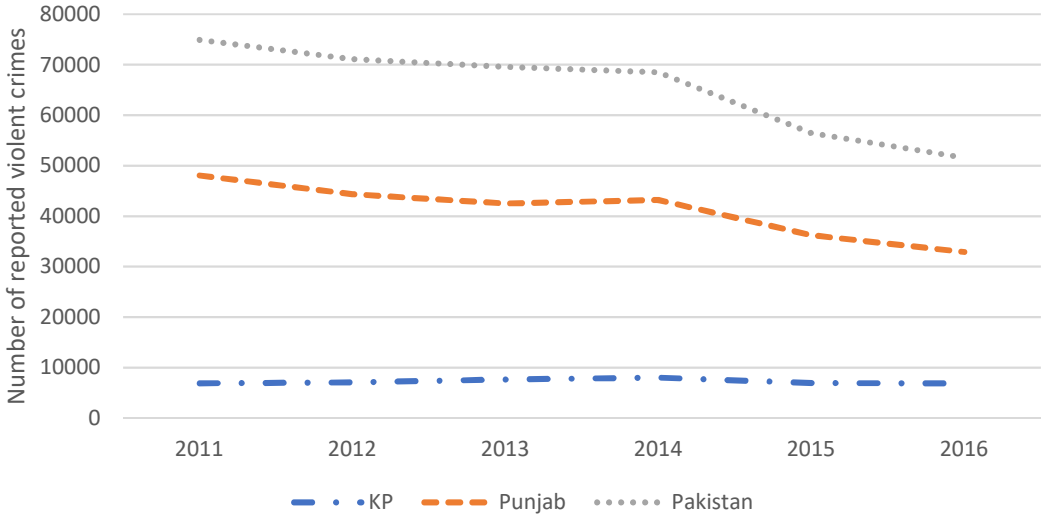
Source: *GoP, 2016*

Government of Pakistan (GoP) classifies total crimes in nine sub-categories as; murder, attempted murder, kidnaping/abduction, dacoity, robbery, burglary, cattle theft, and other related crimes. The last category is a catch-all category which include crimes not included in the first eight categories. To evaluate violent and property crimes trends in Pakistan, the reported crimes are classified in two broad categories. The violent crimes category includes murder and attempted murder, kidnaping/abduction, dacoity and robbery[6]. The rest of the reported crimes are included in the property crimes category. The data is plotted in figure 2.2 below.

As is illustrated in figure 2.2, violent crimes in Pakistan (and Punjab) are steadily decreasing since 2011 but the rate in KP is showing a marked increase during the same period. This might reflect a phenomenon known as "crime displacement" in the literature (Barlow & Kauzlarich, 2010). Crime displacement is said to take place when police effort in one place causes crime to increase in the other (neighboring) place. However, violent crimes are also decreasing in KP since 2014 which is an encouraging sign.

[6] A violent crime or crime of violence is a crime in which an offender or perpetrator uses or threatens to use force upon a victim (Seigel, 2016). This entails both crimes in which the violent act is the objective, such as murder or rape, as well as crimes in which violence is the means to an end.

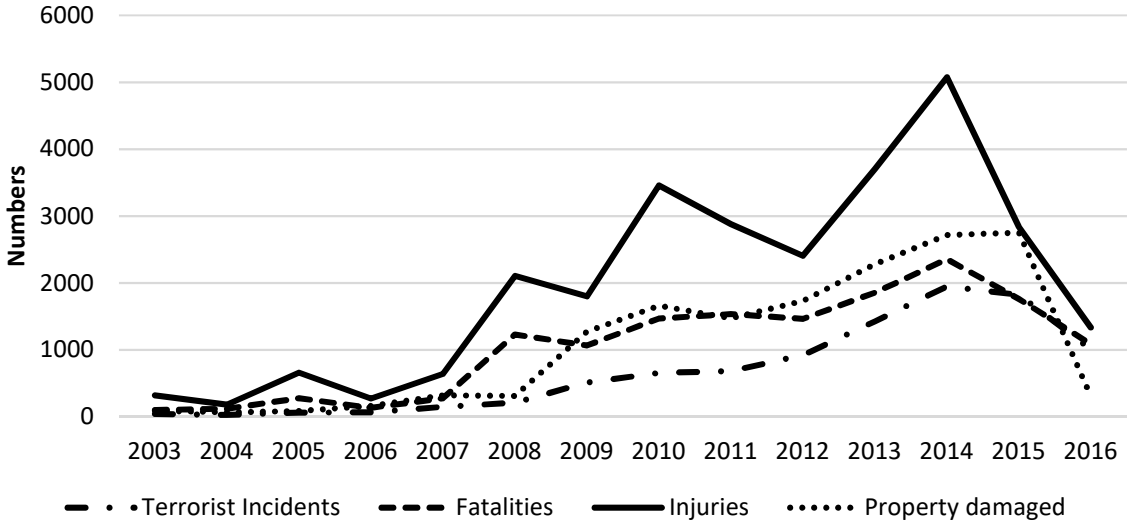
Figure 2.2 Trend in violent crimes (2011-2016)



Source: *GoP, 2016*

The official statistics as illustrated in figure 2.2 are in sharp contrast with that reported in Global Terrorism Index. For instance, in official statistics, the rate of violent crimes in Pakistan is decreasing continuously since 2011 but the Global Terrorism Index data (plotted in figure 2.3 below) shows that terrorist incidents and the resulting fatalities and injuries show a clear upward trend until 2014. The data reported in figure 2.2 is also not in line with the five-year report of National Crime Data (NCD) which claims violent crime to have increased by 27.5 percent from 2008 to 2013 (BMI, 2017).

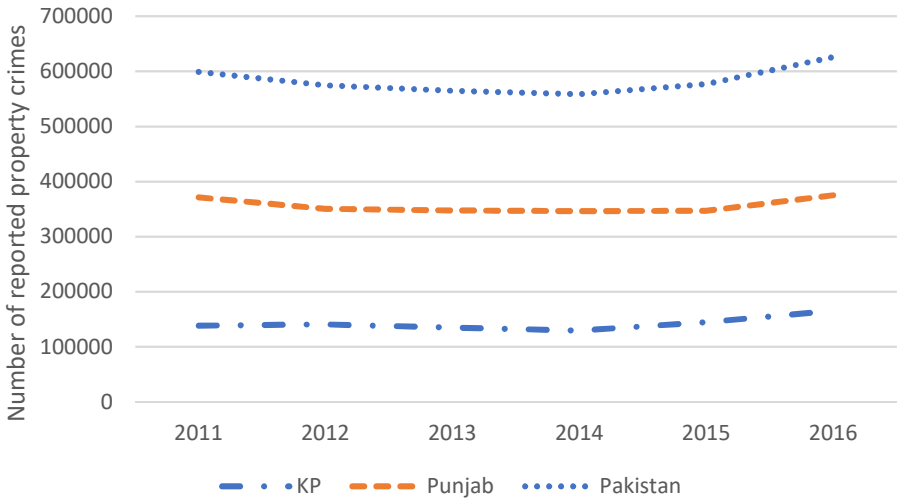
Figure 2.3 Trends in terrorist incidents (2003-2016)



Source: *Global Terrorism Index, various issues*

The property related crimes (property crimes hereafter)[7] trend as illustrated in figure 2.4, include burglary, cattle theft, other theft and the catch all category. Nationwide property crimes increased from a total of 576,820 in 2015 to 625,978 in 2016, registering an increase of 8.5 percent. Property crimes in KP, however, increased from 145147 to 165,458, registering an overall increase of almost 14 percent which is well above the national average.

Figure 2.4 Trend in property crimes (2011-2016)



Source: *GoP, 2016*

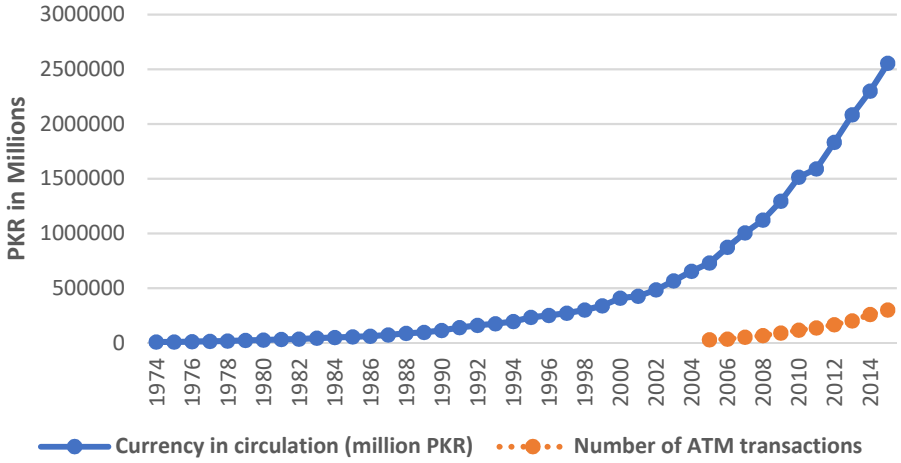
The above depictions of crime rates in Pakistan ignore one important category of crime, i.e. white-collar crimes. To the best of my knowledge, there is no data available on white-collar crimes in Pakistan. However, as suggested by Becker (1968), currency in circulation can be used as an indirect evidence of white-collar crimes growth in the country. Currency in circulation may not be a reasonable proxy for violent crimes but given that currency has an obvious advantage over banking transaction in illegal activities, it is certainly a reasonable proxy for the incidence of property and white-collar crimes.

Figure 2.5 illustrate the amount of currency in circulation in Pakistan since 1974. The figure also shows the number of ATM transactions since 2005. Both currency in circulation and ATM transactions are showing a clear upward trend. In the absence of property and white-collar crimes, the increase in the number of ATM transactions should have, in principle, decreased currency in circulation. Since this is not the case, the increasing trend in both variables may be showing that property and white-collar crimes are steadily increasing in Pakistan. Such doubts are also being

[7] Crimes that are committed for obtaining money, property or other benefits are termed as property crimes.

raised by a recent BMI research report (BMI, 2017) with respect to the huge cash-based economy of Pakistan and business crimes.

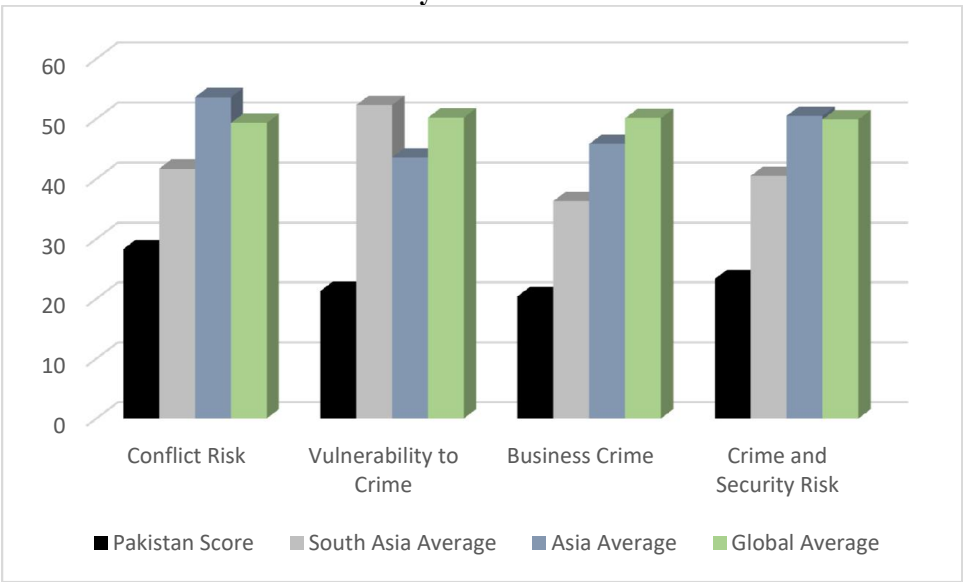
Figure 2.5 Currency in circulation (1974-2015)



Source: *State Bank of Pakistan (SBP), 2016*

As shown in figure 2.3, most of the international thinktank reports are not in line with the official crime statistics of Pakistan. Rather Pakistan is portrayed as a country where crime and extremism are on the rise with each passing year. For example, and besides GTI (2017), the Business Monitor International (BMI, 2017) also rates Pakistan as one of the worst countries in terms of risk that results from crime and violence. The data from the BMI (2017) is reported in figure 2.6 which shows that Pakistan's score on all the dimensions is far below the regional and global average.

Figure 2.6 Pakistan's Crime and Security Risk



Source: *Business Monitor International (BMI) Research, 2017.*

2.3 The criminal justice system in Pakistan

CJS is a system of institutions and practices that maintain social order by discouraging revenge, deterring crime and punishing violations of the law (Siegel, 2016). It attempts to regulate violence through legal systems that authorize the police and the military to use violence within prescribed parameters while penalizing those who use it in other ways (David, 2006). The modern CJS is usually classified in three main parts (Lee, 2016), i.e. legislation, adjudication, and correction. The overview in this chapter ignores legislation and focuses instead on police, courts and the correctional centers.

Table 2.1 below reports total expenditure on public order and safety as a percentage of total general revenue receipts of the provinces. The total general revenue receipts of the provinces include federal transfers (such as share of each province in the divisible pool of taxes, straight transfers and federal grants) and provinces own (tax and non-tax) receipts. The ratios calculated for the federal government are based on net federal resources. As the table shows, provincial governments on average spend a total of 11 percent of its total revenue receipts on public order and safety. Within the sub-parts of the CJS, police department absorbs most of the public money devoted to public order and safety followed by courts and prison administration and operations. At the federal level, courts are allocated the major chunk of the money followed by police and prison administration.

Table 2.1 Expenditure on police, courts and prisons as a percentage of total general revenue receipts

	KP Government		Federal Government		Other Provinces	
Heads	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Public order and safety	11.187	10.578	3.035	2.488	10.345	10.916
Police	8.909	8.618	0.127	0.117	7.985	8.221
Courts	1.327	1.129	2.815	2.297	1.360	1.293
Prison administration	0.543	0.430	0.001	0.001	0.547	0.548

Source:*Provincial and Federal Budgets, 2017-18.*

2.3.1 Police

The police have the job of identifying and arresting offenders, discovering violations of the law and maintaining public order. According to the police act of Khyber Pakhtunkhwa (2017), the police must perform a number of important duties. These duties include (but are not limited to);

- Protecting life, property, honor and liberty of people
- Preventing the commission of offences
- Detecting, investigating and bringing offenders to the justice
- Countering militancy and terrorism
- Collecting and communicating intelligence
- Regulation and controlling of traffic on public roads and streets
- Plus, several emergency and special duties

In effect, the police have the primary responsibility for enforcing the law. This means that they are the point of entry into the criminal justice system and the place where words on statutes are converted into activity that maintains social order. Because of this, police are rightly named as the gatekeepers of the criminal justice system (Smith & Natalier, 2004).

Given this myriad of responsibilities, no one doubts the importance of an agency that provides those functions (ISPU, 2009). However, given the diverse and countless nature of responsibilities, research has shown on several occasions that (e.g. see Conklin, 1977) most of the police time is spent on activities that have nothing to do with crime prevention. Bayley (1994, P. 3) expresses his skepticism of police as a crime prevention agency by stating that, "*the police do not prevent crime. This is one of the best-kept secrets of modern life. Experts know it, the police know it, but the public does not know it. Yet the police pretend that they are society's best defense against crime. This is a myth.*" Bayley (1994), however, ignores volumes of empirical findings that police presence and strength does have a negative effect (i.e. general deterrence) on crime rates.

The diversity in responsibilities also makes it difficult to measure the performance of the police force. With respect to crime prevention, an ideal way to measure the police performance would have been the number of crimes deterred by the police. But how one can measure something that has not happened in the first place? In popular media, we usually hear people referring to the number of police-martyrs in line of duty as it is a measure of police performance. It certainly is

not a measure of (good) performance. Alternatively, arrest statistics are usually used as a measure of performance. Despite the inherent weaknesses in arrest statistics as a measure of performance, such statistics, to the best of my knowledge, are not available in published form in Pakistan. Hence, one is left to use the crime trends as a measure of police performance which is detailed in the previous section.

Table 2.2 Police strength in Pakistan and its neighboring countries

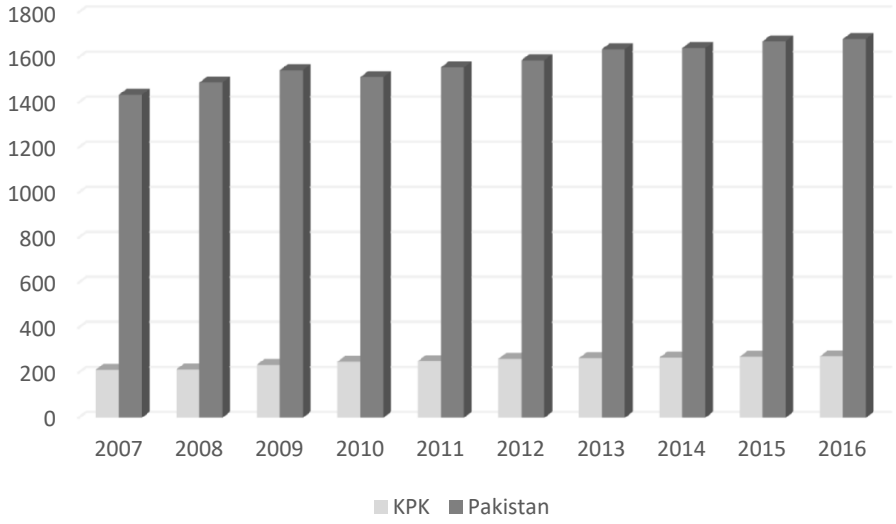
Country	Total police force	Police per 100000 population
Afghanistan	122,000	368
Bangladesh	155,809	98
India	1,760,217	138
Iran	60,000	84
Nepal	60,000	216
Pakistan	525,000[8]	271
Sri Lanka	89,000	438

Sources: *Interpol, 2015. National Crime Records (NCR), 2015. Center for Strategic and International Studies (CSIS), 2006. United States Institute of Peace (USIP), 2011 and BMI, 2017.*

Tengpongsthorn (2017) associated police performance with adequate manpower, modern equipment, working conditions and relationships with the citizens. With respect to manpower, the United Nations (UN) recommends one police officer for every 400 persons (USIP, 2011) during peace time. Looked at this standard, the combined strength of the federal and provincial police force in Pakistan is approximately 0.525 million, which is one of the largest police force in the neighboring countries (Table 2.2). The ratio of police to population in Pakistan is 1: 368 which is better than the UN recommendations. Given that Pakistan army has also recently shifted its focus to internal security (BMI, 2017), the ratio gets even much better if part of the total army strength (which is 640,000) is added to police strength.

[8] The total police force as reported above include 425000 police officers and 100000 officers of Frontier corps and Pakistan Rangers (BMI, 2017)

Figure 2.7 Number of police stations in Pakistan and KPK (2007-2016)



Source: *PBS, 2016*

Besides strength, the police force to have the desired crime deterrence effect, it should be spread in each part of the country. Data on police stations at each division level is available and is attached as appendix 01. A summary is depicted in figure 2.7 which shows the number of police stations (excluding police Chowkies) in Pakistan and Khyber Pakhtunkhwa since 2007. In the ten-year period that the data covers, the number of police stations has increased from a little over 1400 to a little over 1600 police stations. Even though the number of police stations have increased over the years, there are still some areas in the country which are beyond the police reach (BMI, 2017). Besides pressure groups and gangs not allowing law enforcement in certain territories, the police force is also predominantly engaged in cities to focus on anti-terrorism activities (OSAC, 2017). This has weakened the outreach of the police to remote areas.

Despite reasonable in terms of numbers, it has been observed that the police force in Pakistan is under equipped, poorly trained, deeply politicized and chronically corrupt (ISPU, 2009; TIP, 2013; BMI, 2017; OSAC, 2017). Currently, there are only a few forensic laboratories in the country which leaves the police with no options but to torture the accused for confessions. Reportedly, the famous Manawan police academy contains no beds, only twelve toilets but no showers and no medical facility. Consequently, 30 percent of the recruits, on average, routinely skip their training schedules due to illness (ISPU, 2009). The police order 2002 was meant to give the police operational freedom from political interference but subsequent amendments in the Act, especially

with respect to recommendations of transfers and promotions, made it impossible for the police to ignore the political advice (ISPU, 2009; HRCP/CHRI, 2010).

Table 2.3 Sanctioned police posts in KP

Rank	Number of sanctioned posts	Punished officials	Percent of punished officials
Provincial Police Officer	1	Nil	Nil
IGP	5	Nil	Nil
DIG	18	Nil	Nil
SSP/AIG	35	Nil	Nil
SP	78	Nil	Nil
ASP/DSP	263	19	7.22
Inspector	698	65	9.31
SI	2547	423	16.61
ASI	3379	507	15.01
Head Constable	8446	667	7.89
Constable	52706	4605	8.74
Total	**68176**	**6286**	**9.22**

Source: *KP Police Department*, 2017

With respect to the relationship of police with the citizens, a recent study by the Transparency International, Pakistan (TIP, 2017) stated that 90 percent of their respondents were reluctant to report crime due to discriminatory treatment by the police. The study also stated that a good number of their respondents reportedly do not want to contact police in times of need due to fear of harassment. Such negative perceptions of the police force in Pakistan are also reported by OSAC (2017). Given that police are a reactive force, noncooperation in reporting seriously undermines the effectiveness of the police force in crime prevention (Brereton, 2000; Smith & Natalier, 2004).

Moreover, the effectiveness of police force to deter crime also depends on the level of corruption and rent seeking behavior prevailing in the police department (Sieberg, 2005). Corruption can take two forms: bribery, where law enforcers accept payments in return for not reporting crimes or apprehending offenders, and extortion, where law enforcers demand payments for not falsely accusing individuals. Bribery reduces deterrence by lowering expected penalties. By definition, the bribe payment is less than the potential sanction. Extortion reduces deterrence by reducing the difference in the net payoffs between criminal activity and non-criminal activity. Although improving consistently over the years, Pakistan (as is shown in the table 2.4) is still amongst some of the most corrupt countries as ranked by the transparency international.

Table 2.4 Corruption perception index

Country	Rank	Scores				
		2012	2013	2014	2015	2016
Afghanistan	169	8	8	12	11	15
Bangladesh	145	26	27	25	25	26
India	79	36	36	38	38	40
Iran	131	28	25	27	27	29
Nepal	131	27	31	29	27	29
Pakistan	116	27	28	29	30	32
Sri Lanka	95	40	37	38	37	36

Source: *Transparency International, 2017*

Payments to avoid being charged of an offence is widespread in Pakistan (OSAC, 2017). Amongst various public institutions in Pakistan, police force is consistently ranked as the top most corrupt department by the Transparency international (see table 2.5 below). Transparency International's Global Corruption Barometer (2013) shows that 82 percent of respondent's regard Pakistan's police force as corrupt or extremely corrupt, making it the most perceptibly corrupt institution in the country. This perception of corruption is supported by the fact that in the same survey, 65

percent of the respondents admitted to paying a bribe to the police, indicating the widespread scale of corrupt practices within law enforcement.

Recently, the Sindh additional inspector general revealed to the Supreme Court that more than 12,000 personnel were recruited illegally in police department from 2012 to 2015 and that 99 percent of funds were illegally issued in cash for investigation in various cases (BMI, 2017). The same picture also emerges from the KP police department data (as reported in table 2.3) who punished, on average, approximately 10 percent of its employees on various charges. All such stories collectively resulted in most of the public discounting the police force as an effective law enforcement agency, considerably deflating its ability to maintain law and order.

Table 2.5 Corruption in various public-sector departments

Transparency International Rankings				
2002	**2006**	**2009**	**2010**	**2011**
Police	**Police**	**Police**	**Police**	Land Administration
Power Sector	Power Sector	Power Sector	Power Sector	**Police**
Taxation	**Judiciary**	Health Sector	Land Administration	Taxation
Judiciary	Land	Land	Education	**Judiciary**
Custom	Taxation	Education	Local Governments	Power
Health Sector	Custom	Taxation	**Judiciary**	Tender and Contracting
Land	Health Sector	**Judiciary**	Health	Customs
Education	Education	Local Governments	Taxation	Health
Railway	Railway	Custom	Customs	Military
Banking Sector	Banking Sector	Tendering	Tender and Contracting	Education

Source: *Transparency International, 2011.*

2.3.2 Judiciary

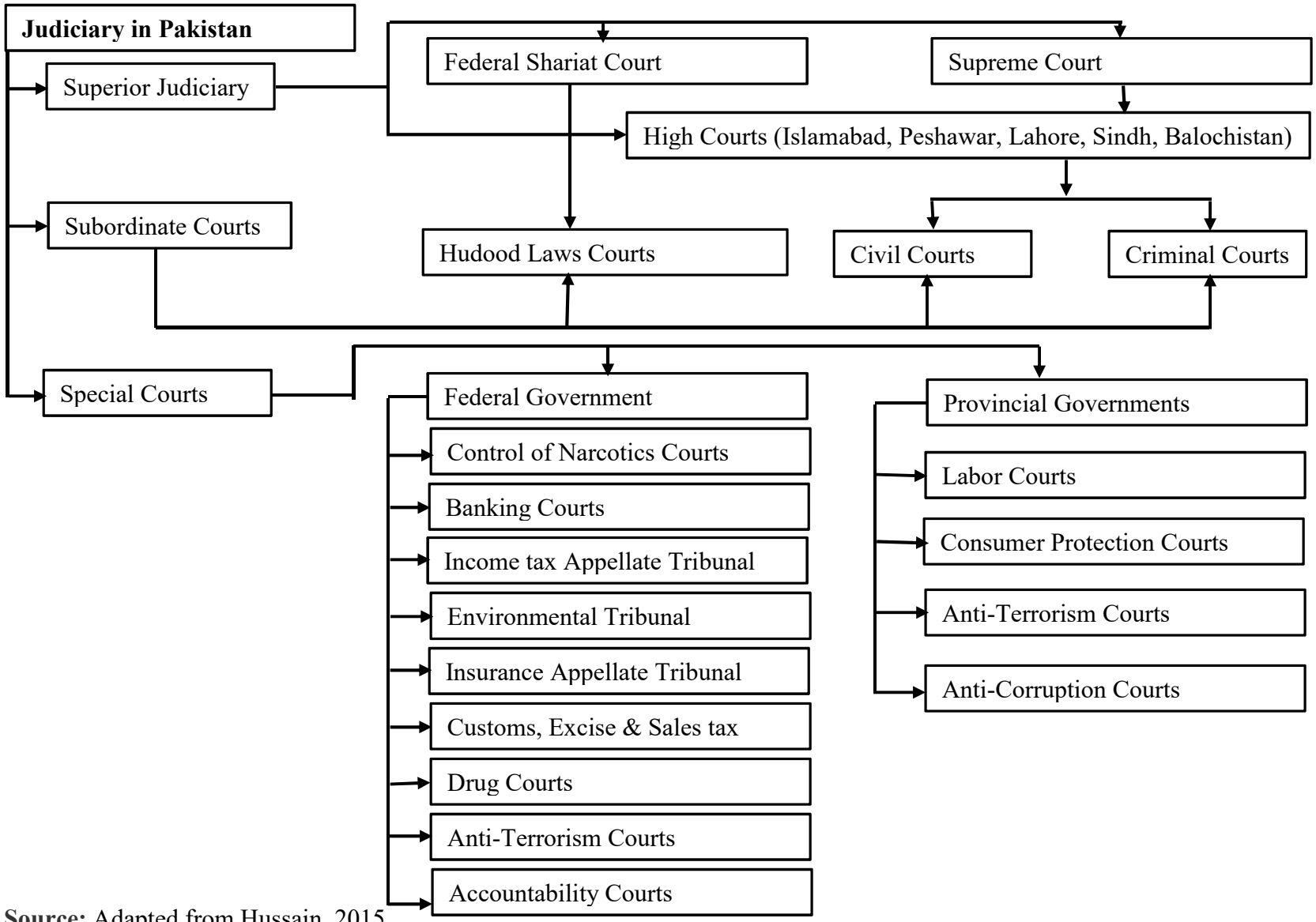
Judiciary is the second most important element in the criminal justice system for controlling crime. The current judicial system of Pakistan originated during the Hindu rule over India with

subsequent modification during Muslim and British rule (Hussain, 2015). After independence in 1947, the Government of Pakistan reserved the Government of India Act 1935 and hence the British period legal and judicial system continued, with amendments overtime to suit the requirements of the country (Hussain, 2015).

The judicial system of Pakistan, as depicted in Figure 2.9, can be classified in three categories; Superior courts, subordinate courts and special courts. The superior courts of Pakistan include the Supreme Court, the Federal Shariat Court and the five high courts situated in each provincial capitals and Islamabad. The superior courts are important in that these courts hear appeals on cases decided in the subordinate courts but the bulk of cases, approximately 90 percent of the total filed cases, are decided by the subordinate courts (Hussain, 2015). The subordinate courts are further classified as; Civil courts, criminal courts and courts entertaining criminal cases under Hadood laws. Besides, there are several special courts and tribunals which operate under the federal and provincial governments.

The constitution of Pakistan makes it mandatory for the state to provide inexpensive and speedy justice to the citizens. As the judicial system of Pakistan is characterized by excessive work load and is perceived as one of the most corrupt institution (TIP, 2011) in the country. These characteristics make the provision of speedy and inexpensive justice improbable. Currently, the total number of judges in the country stands at 4200 (Hussain, 2015) which is, by far, an inadequate number by international standards. If the current population of the country is 190 million, then there is a single judge for every 45238 people in Pakistan. Considering the last reported figure of crime in Pakistan (i.e. 677554 reported crimes in 2016), and if there are no civil cases the judges have to deal with, a single judge will have to deal with 162 criminal cases annually. Resultantly, the number of pending cases, as is shown in figure 2.7 and 2.8 increases with every passing year.

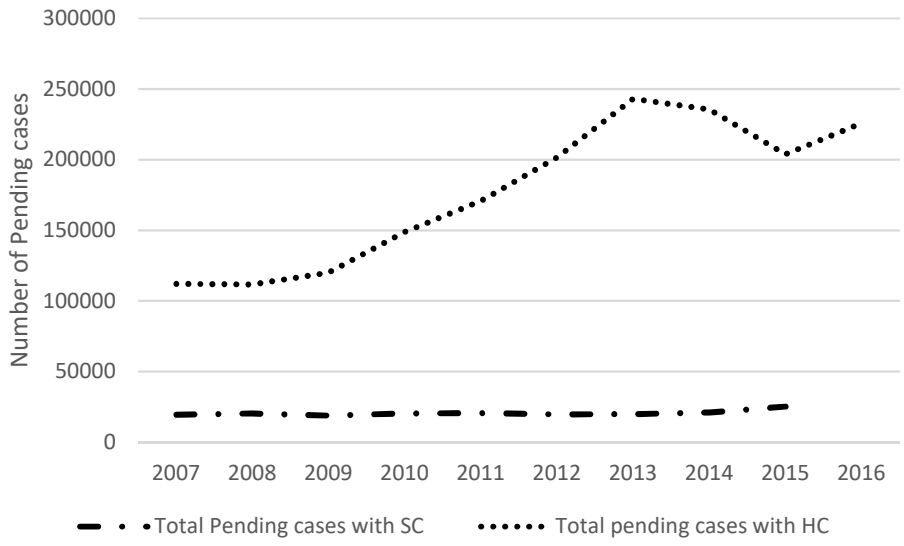
Figure 2.8 Courts Organogram of Pakistan



Source: Adapted from Hussain, 2015

As is evident from figure 2.7, the number of pending cases with the superior courts is increasing each year apart from 2013-14. The decline in the pending cases in 2013-14 with the superior courts could be attributed to several factors. First, it could be the result of the National Judicial Policy 2009 (or the Black Coat protest of 2009) which stressed on disposing off the number of pending cases with superior, as well as subordinate courts. Second, several other important events also took place in the year 2013, such as the general elections and the retirement of Iftikhar Muhammad Chaudhry, which may have an impact on the performance of the superior judiciary[9]. However, the drop in the number of pending cases was short lived as the number is mounting once again since 2015.

Figure 2.9 Pending cases with superior courts (2007-2016)



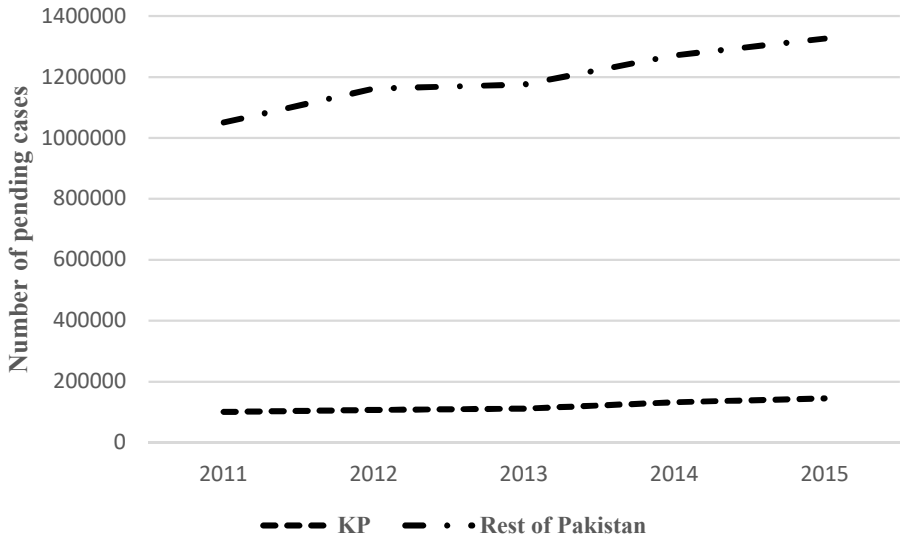
Source: *Various issues of Judicial Statistics of Pakistan*

The performance of the subordinate courts in dealing with the mounting cases is even worse. As is shown in figure 2.8, the number of pending cases with the subordinate courts is mounting each year. While the number of pending cases with subordinate courts dropped, albeit slightly, in 2012 in the rest of Pakistan, the trend in KP is increasing even in 2012. Besides pendency and corruption (perceived), there is no "witness protection system" in the criminal justice system of Pakistan. The

[9] That is, the judiciary might have increased its efforts to say a grand farewell to one of the most popular chief justice of Pakistan, or the new chief justice might have full the tight to show performance.

witness, and probably the judges, fear the retaliatory action of the criminals. This, in majority of the cases, results in declaring criminals non-guilty (USIP, 2011).

Figure 2.10 Pending cases with subordinate courts (2011-2015)



Source: *Various issues of Judicial Statistics of Pakistan*

These characteristics of the judicial system of Pakistan have important bearing on the crime control policy of the country. First, the non-existence of the witness protection in the system results in a lower probability of conviction. The lower probability of conviction is synonymous to the lower cost of offending which in principle should increase crime rates in the country. Second, perceived corruption also reduces the severity of sanctions which again should result in more offending. Third, and most importantly, longer delays in justice can encourage individuals to seek alternative ways of dispute resolution. These alternatives could be resorting to the Panchayat or Jirga system (council of elders), or even to the use of power. This in turn undermines the legitimacy of the court system and (sometimes) results in exploitation.

2.3.3 Prison Administration

The mission statement of the KP Inspectorate of Prisons reads as, "*To provide safe custody (keeping inmates in safe place of confinement), care (meeting basic needs such as accommodation, food, education and medication), control (maintaining order and discipline within the prison premises), and correction (motivating inmates through psychological, ethical, moral and vocational training to become productive and law-abiding citizens)*". Although the mission

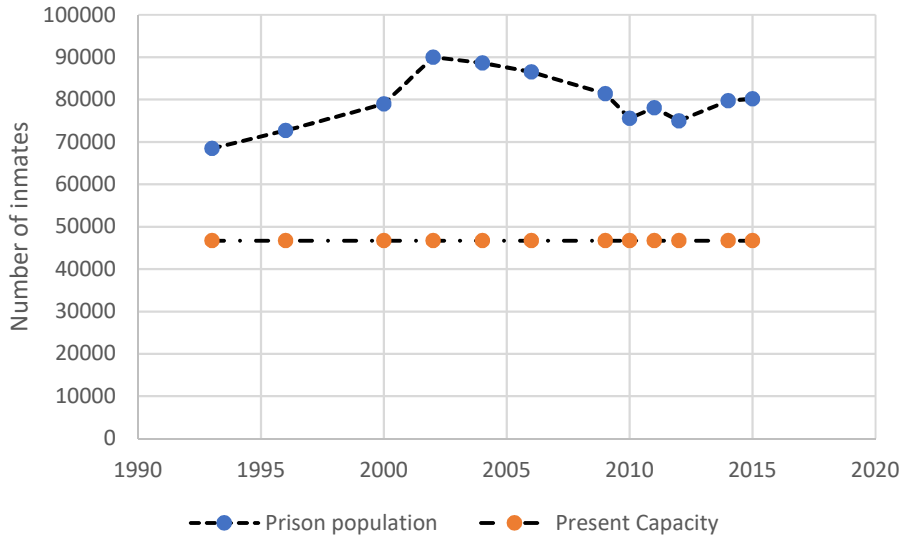
statement signifies that the focus of the prison administration in KP is on incapacitation and rehabilitation, prisons also serve two additional purposes of retribution and deterrence.

Incapacitation as a crime prevention strategy no doubt has visible advantage in that inmates cannot commit crime on the outside society (Tilley, 2009). There are however several problems in incapacitation as a crime prevention strategy (Zimring & Hawkins 1995). The first one is that it risks committing an injustice on the perpetrator. Punishments are backwards-looking imposed based on what the offender deserves for what he or she has done, not for what they might do in the future. Second, even if it were to be accepted that incapacitation for expected future behavior were to be sanctioned in the interests of the safety of others rather than the deserts of those incarcerated, predicting individuals' future criminal behavior is very difficult. Many would suffer an unjust harm by being incarcerated (or otherwise incapacitated) for an act they would not commit in any case. In so far as this was the case, the state too would unnecessarily bear the costs of applying the incapacitation. Third, specifically in relation to imprisonment as a means of incapacitation, the experience of peering with other inmates is liable to increase rates of criminality on release. Instead of providing incentives for offenders to stay away from crime, prisons are better known as a training grounds for criminals (Sieberg, 2005). Fourth, incapacitation may not reduce the supply of criminals in the society if crime pays over and above the market wages. Incapacitating one individual will leave the space for another to enter in crime market if returns to such activities are higher.

The purpose of rehabilitation in prisons is to make inmates productive members of the society. This purpose is based implicitly on the assumption that inmates are people from the marginalized segments of the society who are deficient on morality and skills. Thus, equipping them with moral values and vocational skills would make them productive members of the society. There are however several problems in this line of reasoning. First, if the reasoning is correct then why should the authorities wait for such people to display criminality? Why not instill moral values and job-related skills in people of marginalized societies in the first place? Second, rehabilitation and deterrence seem to conflict with each other. For instance, if rehabilitation enhances the work-related skills and job opportunities of individuals, it would weaken the informal social control of job market discrimination and may increase participation in criminal activities (Otsu, 2016). Rehabilitation programs also improve quality of life in prisons which effects crime deterrence negatively (Katz, Levitt & Shustorovich, 2003).

According to the most recent available data, there are a total of 80,169 inmates (WPB, 2017) in 91 prison facilities of Pakistan. The total sanctioned capacity of these 91 prisons facilities is 46,705 inmates. Figure 2.10 illustrates the trend in prison population in Pakistan. As is evident from the figure, the total prison population in Pakistan increased since 1993 until 2002, when the number reached to its all-time maximum of 90000 inmates. The number of inmates decreased after 2002 until 2010 and is increasing again in recent years. However, as is shown by the distance in the two lines, the prison facilities in Pakistan are historically overcrowded. Besides understaffing and poor management, overcrowding seems to be the biggest problem of the prison administration system in Pakistan (ICG. 2011). This problem is particularly severe in Punjab where, reportedly, the jail administration has introduced "sleeping shifts" for the prisoners because of overcrowding (Chitkara, 1997).

Figure 2.11 Prison population of Pakistan (1993-2015)



Source: *World Prison Brief, 2017*

In KP, the total number of prison facilities stands at 22, with a total sanctioned capacity of 8,091 inmates. As is outlined in table 2.6, the difference between the sanctioned capacity and the current inmates' population is not as pronounced as in overall Pakistan. Still there are some prison facilities that are overburdened (such as Central Prison Peshawar which house 2227 inmates as against the sanctioned capacity of 850 inmates) while others are underutilized (such as Central Prison D.I.Khan). 98 percent of the inmates in the KP prisons are male while the rest are female.

Table 2.6 Prison population of KP (2015)

Prison	Sanctioned Capacity	Present population		
		Male	Female	Total
CP Peshawar	850	2184	43	2227
CP D.I. Khan	1506	384	0	384
CP Haripur	1597	1855	37	1892
CP Bannu	720	730	24	754
DJ Kohat	500	499	0	499
DJ Mardan	314	596	15	611
DJ Swat	200	-	-	-
DJ Abbotabad	208	-	-	-
DJ Chitral	164	90	2	92
DJ Timergara	250	509	22	531
DJ Mansehra	485	571	9	580
DJ Karak	227	155	0	155
DJ Daggar	145	206	6	212
SJ Charsadda	120	234	12	246
DJ LakkiMarwat	99	227	0	227
SJ Batagram	118	50		50
SJ Dassu	210	47	0	47
SJ Dir	60	105	0	105
JL Swabi	75	417	8	425
JL Nowshera	130	302	0	302
JL Tank	13	52	0	52
JL Malakand	100	107	5	112
Total	8091	9320	183	9503

Source: *Inspectorate of Prisons, Khyber Pakhtunkhwa*

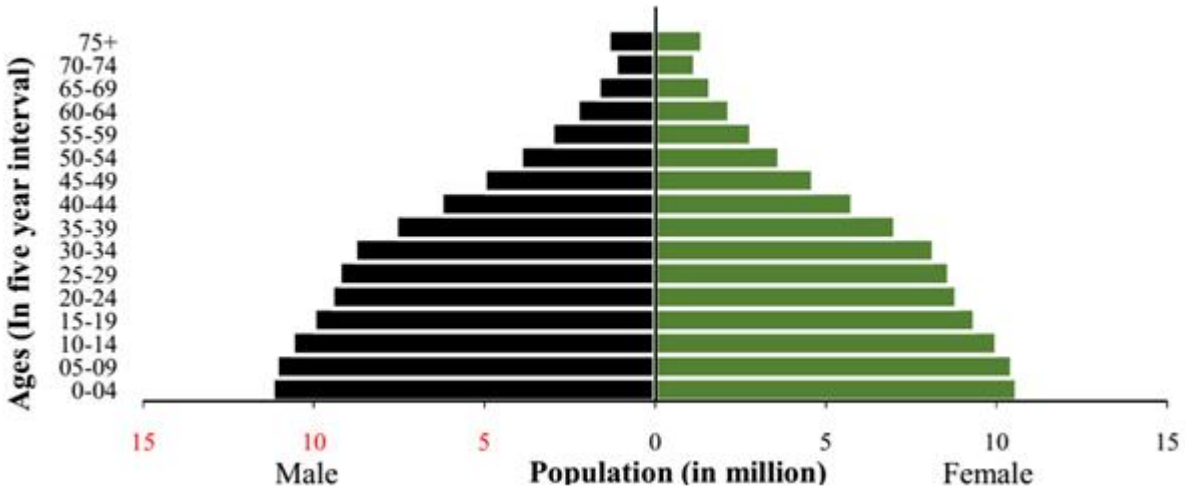
The problems of overcrowding and mismanagement in the prison administration system have several counterproductive effects for crime control in the country. First, more than 50 percent of the inmates are prisoners waiting or on trial (ICG, 2011). Since there is no classification for prisoners (and if there is one on paper, it becomes meaningless given overcrowding), the interaction of people accused of minor crimes with hardened criminals produce criminal tendencies even in the innocents. Second, the continued arrest of the juvenile delinquents for petty crimes (ICG, 2011) and the nonexistence of specialized prisons in the country, except Sindh, have made prisons as a recruitment facility for criminals. In effect, the current prison administration might be serving criminality more than it serves the criminal justice system. The provincial governments are trying to increase the inmate capacity by building new prisons, but the problem

is not only of insufficient space. All that one can expect from such a policy is the continuous growth of the prison population but nothing else.

2.4 Conclusion

The time series evidence presented in section 2.2 shows that the overall crime and property crime rate, despite occasional drops, are showing an increasing trend in Pakistan. Violent crimes, on the other hand have clearly shown a declining trend in the near past (as reflected in the official statistics). Speculation about the future of crime rates in the country is difficult, but certain universal correlates of criminality can help in predicting the future. Two of the universal correlates of crime (e.g. see Ellis, 1988) are very relevant for the future of crime rates in Pakistan. Research suggests that age and urbanization are two of the most important correlates of crime. Crime is predominantly a teen-age activity and teens brought up in urban environments are more prone to criminality than others (Ellis, 1988).

Figure 2.12 Age and Sex composition of Pakistan, 2017



Source: *Pakistan Economic Survey, 2016-17.*

As shown in figure 2.11, a good majority of the total population of Pakistan will be in their teens soon. Lin (2012) has recently informed the developing world that the youth bulge brings with itself a promise of prosperity and a genuine threat of social disorder. Similarly, a much-cited article of Hirschi & Gottfredson (1983) states that, "age is everywhere correlated with crime" and that this association does not depend on economic status, marital status, race, or sex. Thus, the future trends

of crime in Pakistan very much depend on how the energies of the youth are utilized. In the absence of proper channelization, crimes in Pakistan are expected to increase with the youth bulge.

A well-functioning criminal justice system is the foundation of civilization, but a dysfunctional one can effectively cause barbarism (Rummel, 1994). A cursory review of the criminal justice system of Pakistan above reveals that police and judiciary are perceived as the most corrupt and unfriendly institutions of Pakistan. The effectiveness of the police, and for that matter of the whole CJS, in controlling crime depends on society's cooperation. A corrupt and non-friendly criminal justice system is least likely to receive cooperation from the public. This is especially true where alternative and competing forms of dispute resolution (such as Panchayat and Jirga system) exist along with the criminal justice system. Therefore, to make criminal justice system more effective, its public perception must be improved.

Besides, the judicial system is characterized by an ever-increasing pendency of cases, and the prisons are historically overcrowded in Pakistan. Given that crimes rates are expected to increase with youth bulge, both the work load of judiciary and overcrowding in prison facilities are expected to increase even further.

Chapter 03

Literature Review

3.1 Introduction

There are virtually more than hundred theoretical explanations for why people engage in criminal activities. Reviewing all those theoretical perspective in this study is neither possible nor desirable. To restrict the scope of the literature review, two guiding principles are used for inclusion of theories. The first principle relates to the rationality of the individuals. That is, all those theories are included which consider individuals to act on their free will and choose behavior [not necessarily strictly] rationally. The second principle is inspired by Garland (2002, p. 54) who stated that, "*The central purpose of scientific research [is] not the construction of explanatory theory but instead the more immediate end of aiding the policy-making process*". Hence only those theories are included which has some policy relevance. Consequently, theories based on the pre-destined actor model (biological positivism for example), and those whose principle variables cannot be measured to guide policy (such as theories based on psychoanalysis) are excluded. Besides, theories other than the economics model(s) of crime are only discussed briefly. The economics model of crime (which is also called the rational actor model in this review) and empirical studies based on this model are discussed in detail. Empirical literature from Pakistan is discussed separately at the end of the chapter.

3.2 Theoretical Developments (other than the rational actor model)

3.2.1 Broken Window theory

The key tenet of broken windows theory, by Wilson & Kelling (1982), is that if small signs of disorder are permitted to make up, a permissive environment for antisocial behavior is likely to follow. A stage may come at which crime may go out of control, when no-one seems to care about it and where marginal increases are no longer noticed. It is then very hard to handle the situation (Tilley, 2009; D'Orsongna, & Perc, 2015). In effect, broken windows theory implies that small social and physical disorders are like an epidemic which, if left uncontrolled, would result in more serious crimes (Gladwell 2000). One way these social disorders (e.g., loitering, public drinking, and prostitution) and physical disorders (e.g. vacant lots, trash, and abandoned buildings) lead to more crime is that it causes residents and workers in a neighborhood to be fearful. Fear makes

many stable families to go away of the neighborhood and the remaining residents are to face loneliness and avoid others. Anonymity increases and the level of informal social control decreases. The absence of control and escalating disorder attract more potential offenders to the area and this increases serious criminal behavior (Welsh, Braga & Bruinsms, 2015). Thus, according to the theory, it is social and physical disorder that causes serious crimes to emerge.

An obvious implication of the theory to control crime is to control signs of physical and social disorder (Tilley, 2009). Wilson & Kelling (1982) do not point out how police departments should execute broken windows policing strategies, but the theory operationalized in the shape of zero tolerance policing, quality of life policing and stop-and-frisk policing strategies (Welsh, Braga & Bruinsms, 2015). All such policing strategies focus its attention on minor or even non-criminal activities, hoping that controlling small disorders will help control more serious crimes. The widespread adaptation of such policing strategies around the world implies the popularity of the broken windows theory amongst the criminal justice system authorities in recent times.

Although contemporary policing strategies are predominantly based on the implications of the theory, empirical support for the broken windows theory is mixed. Empirical studies that support, albeit weakly, the argument that policing strategies based on broken windows theory include; Kelling & Sousa, 2001; Taylor, 2001; Funk & Kugler, 2003; Corman & Mocan, 2005; Melendez, 2006; Keizer, Lindenberg & Steg, 2008; and Engel et al., 2014. In contrast, studies that has evaluated various policing strategies based on broken windows theory but found no significant impacts of such policing on crime are; Katz, Webb & Schaefer, 2001; Harcourt & Ludwig, 2006; and Geller, 2007.

Although the theory has attracted a good deal of attention from the academia, its emphasis on social and physical disorder may be misplaced. As is pointed out by Sampson & Raudenbush (1999), social and physical disorders are symptoms of crime, but both are caused by other deep-rooted factors (such as poverty, residential instability and declining collective efficacy). The theory's limited empirical support is also questionable as it is very difficult to tell from these results whether it is controlling minor disorders or target hardening that results in less number of serious crimes. Besides, policies based on broken windows theory are more likely to backfire in the form of negative externalities (Meares, 2015). It has been observed that policing strategies based on the theory have resulted in more complaints against the police (Greene 1999), discrimination in the

form of racial disparities in the criminal justice system (Harcourt & Ludwig 2006; Golub, Johnson & Dunlap 2007; and Brunton-Smith, Jackson & Sutherland, 2014), and in criminalizing the poor and homeless people (Barr & Pease 2002). Thus, as Sampson & Raudenbush (1999) puts it, policies based on the broken windows theory can best be described as a war against the poor, not a war against the crime.

3.2.2 Integrated theories

3.2.2.1 Control balance theory

Charles Tittle's control balance theory (1995) attempts to explain crime based on individual differences. The theory contends that every individual inherently desires to control things, but control is not evenly distributed amongst people. The uneven distribution of control can be captured by the control ratios. A control ratio is the level of control over different dimensions of the world (other people, physical things, and circumstances) that an individual has in comparison to the control various dimensions of the world have on him or her. Such control ratios vary from large deficits, in which a person is almost totally controlled without being able to control anything, to large surpluses, in which the individual has almost total control over things while having little vulnerability to being controlled. People having a balanced control are likely to be the conformist while those with control imbalances (either deficit or surplus) are likely to be the non-conformists. More specifically, the theory states that unusual behavior results when an individual experience control imbalance. This imbalance in control provokes the individual to do something that might counter the imbalance. Deviance may look an attractive option to the individual to restore his control. Motivations, however, are subject to the availability of opportunities. Thus, if an individual experience a control imbalance, and is in a position to restore control through deviance, then the individual is likely to act upon his motivations if the odds of doing so are perceived beneficial.

As is remarked by DeLisi & Hochstetler (2002, P. 270-71), testing the control balance theory is very complex and *"a test of the theory that approaches its complexity and abstractness is difficult to imagine"*. However, several efforts have been made to test the theory's prediction that control imbalances result in deviance. Examples of such attempts include; Piquero & Hickman, 1999; Hughes, Antonaccio & Botchkovar, 2015; and Fox, Nobles & Lane, 2016. None of the empirical study quoted above support the predictions of the theory in its totality.

3.2.2.2 General strain theory

The main idea of general strain theory (GST) is very simple: when people are handled in an awkward way, they usually become aggressive and may react with crime. Strains refer to events and situations hated by individuals (Agnew 1992, 2001, 2006). Examples of strains include abuse related to child, unemployment and the failure to get one's monetary goals (Agnew, 2010). GST divides strains into three groups: the failure to achieve valued goals (e.g., monetary success, masculinity goals); the actual or threatened loss of positively valued stimuli (e.g., financial loss, the death of a friend); and the actual or threatened presentation of negatively valued stimuli (e.g verbal and physical abuse). Literally hundreds of specific strains fall into these vast categories. But not all of these strains are favorable to crime. Rather, strains are mostly followed by crime when; they are high in amplitude, are perceived as unjust, are linked with low social control, and create some pressure or incentive for criminal coping. A strain that has high amplitude has many features. It is high in degree (e.g., a large financial loss, severe physical abuse). It is usually of long period and recent (e.g chronic unemployment, ongoing abuse). It is high in centrality as well. That is, it gives threat to the individual's central goals, norms, needs, identities or activities (Agnew, 2010).

Strains are most likely to be seen as unjust when they follow the voluntary and deliberate violation of a relevant justice norm. Social controls refer to those elements that restrain individuals from engaging in crime (see Agnew 2005). Many individuals do not involve in crime because they are high in direct controls—that is they are controlled by others who make clear regulations that ban misbehavior, closely monitor behavior, and consistently sanction violations of rules in a sophisticated manner. These others may be parents, teachers, neighbors, employers, and police. Individuals also refrain from crime because they have strong emotional linkage to conventional others, such as parents, spouses, and teachers. Individuals do not want to hurt these others or jeopardize these bonds by engaging in crime. Moreover, individuals refrain from crime because they have a large investment in conventional activities, such as school and work. For example, they have good grades or attractive jobs. So, they do not want to destroy this investment through crime. Finally, individuals refrain from crime because they have been taught that crime is wrong or immoral (Agnew, 2010).

3.2.3 Learning theories

3.2.3.1 Tarde's laws of imitation

An early proponent of the notion that crime is simply a normal learned behavior was Gabriel Tarde (1903) who argued that criminals are primarily normal people who – by accident of birth – are brought up in an environment in which they learn crime as a way of life. In his 'laws of imitation' individuals learn ideas through an association with others. Behavior follows from the incorporation of those ideas. Tarde's first law says that people imitates one another in proportion to how much relation they have with each other and this is very common and changes more quickly in urban areas. His second law states that the lower class usually copies the higher or superior class. His third law states that newer fashions replace older ones for example; murder to shoot has been replaced by knife killing. Tarde's idea later influenced Sutherland to form his differential association theory (Burke, 2013).

3.2.3.2 Differential association theory

To Sutherland (1939; 1947) criminality stemmed neither from individual traits nor from socioeconomic position. Instead, he contends that, it is to be a function of a learning process that could affect any individual in any culture. The theory could be spelled out as; Criminal behavior, and the techniques to express it successfully are learned from interactions with intimate groups (family, friends and peers). Motivations of an individual are usually guided by his perceptions of what is right and wrong, moral and immoral. In turn, these perceptions are also developed while interacting with intimate groups. A person becomes a criminal when he or she is aware of favorable than unfavorable consequences to violate the law. According to Sutherland's theory, individuals become law violators when they are in relation with other people, groups, or events that provide an excess of definitions favorable toward criminality and are isolated from counteracting forces (Siegel, 2016).

3.2.3.3 Neutralization theory

Majority of the criminal behavior theories assume that criminals are distinct set of people from the rest of the society. Matza & Sykes (1964), however, believe that even the most committed criminals and delinquents are not taking part in criminality all the time. They also go to schools, family functions, and religious services. Their behavior can be conceived as falling along a

continuum between total freedom and total restraint. This process, which he calls drift, refers to the movement from one dimension of behavior to another, resulting in behavior that is sometimes unconventional, free, or deviant and at other times constrained and sober. Learning techniques of neutralization makes a person to temporarily "drift away" from conventional behavior and get involved in more subterranean customs and behaviors, including crime and drug abuse (Siegel, 2016). They argue that the process to become a criminal is a learning experience in which potential delinquents and criminals master strategies to neutralize traditional norms and drift back and forth between illegal and traditional behavior.

3.2.3.4 Differential reinforcement theory

The theory of differential reinforcement was proposed by Burgess & Akers (1966). Akers believes people learn to depict their own attitude through their relationship with significant others and groups in their lives. Akers's theory traces that the principal influence on behavior comes from "those groups which control individuals' major sources of reinforcement and punishment and expose them to behavioral models and normative definitions". The significant groups are those with which a person is in differential association—peer and friendship groups, schools, churches, and similar institutions. These groups control sources and forms of reinforcement, define manner as right or wrong, and provide behaviors that can be changed through observational learning. The more individuals learn to explain their behavior as good or at least as justified, rather than as undesirable, the more they are to involve in it. Adolescents who join a drug-abusing peer group whose members value drugs and alcohol and support the use of substances will eventually use drugs themselves (Siegel, 2016).

Learning theories as a whole have mixed empirical support. Several notable research efforts have supported the core principles of the learning theories and significant positive correlations have between reported between deviant friends and criminality. The theories, however, suffer from several limitations. For example, some of the concepts of differential association theory such as "definitions favorable to criminality" are hard to operationalize for empirical testing. It is also very hard to trace people over time, developing accurately when definitions toward criminality begin to outweigh prosocial definitions, and determine if this imbalance creates criminal behavior (Seigel, 2016). The core focus of the learning theories is on situations and ignores the role of setbacks, opportunities and deterrence altogether. In effect, these theories implicitly assume that

only personal and social deterrence are the core concerns of the would-be offenders. If an individual can neutralize his personal guilt and societal shame, then there is nothing to stop him from committing a criminal act. Having said that, learning theories provide good insights in how behavior is modeled and sustained in relation to significant others.

3.2.4 Routine activity theory

Cohen & Felson's (1979) routine activity theory says that for crime to occur, three conditions must coexist. First, there necessarily be a sufficiently motivated offender. Second, there must be a suitable target that the motivated offender is likely to target. Third, there shall be no capable guardians to protect the suitable target. Later refinements to routine activity theory added the presence or absence of an 'intimate handler' to the conditions relevant to criminal acts (Felson 1986). An intimate handler is a significant other in presence of whom a likely offender will be reluctant to commit a crime. A disapproving mother, for example may comprise an intimate handler whose presence in conditions otherwise suitable to a criminal act will prevent its commission because of her influence on the likely offender. The mother's role varies from that of the credible guardian that she does not ward off the crime by protecting the appropriate target rather by disapproving the behavior of the potential offender who is related with her opinion. So, the routine activity theory takes criminal motivations as given and explains the conditions that are necessary for acting on criminal inclinations.

Cohen & Felson (1979) maintain that there are several social developments in the post war USA that led to the increased crime rates. These changes have reduced the home-centeredness of much American life by increasing the number of working women, of single person households and of students. At the same time, these social developments have also provided more activities outside the home in the form of holidays and other leisure activities. Notwithstanding family violence, this has made homes more vulnerable to predatory crimes by removing large numbers of capable guardians. Similarly, the consumer revolution has brought into these homes an increasing number of more suitable targets, specifically in the form of automobiles and electronic goods, the latter having become progressively smaller, lighter and more portable. The overall effect, then, is that crime has increased not because of any social decline, but rather because of growing prosperity and freedom. To put it in simple words, the supply of criminal opportunities now far outstrips the capacity of criminal justice agencies to control them.

Capable guardians and intimate handlers, respectively, are legal and extra-legal forces that prohibit the commission of criminal acts. The two forms of prohibitive forces are interdependent but, as Felson & Boba (2010) argue, the importance of intimate handlers to inhibit criminal motivations depends greatly on people in a community known to one another and knowing each other's neighbors, relatives and work mates. Since such characteristics are dwindling in the modern life, Felson & Boba (2010) argues that the importance of social control will reduce with these modern developments. Many of the same factors, however, are equally responsible for the weakened power of the criminal justice system. Offenders have become more anonymous and non-detectable. Their chances for theft and vandalism have been expanded with the growth in possessions. Their quick movement has reduced the value of preventive patrol, which depends for much of its effect on the police knowing who should and who should not be present in places. The job of the police has also been made tough by the increases in night time activity resulting from more transportation and electricity. Moreover, the police have a wider range of attitude to regulate as more misconduct is brought within the purview of the criminal law. The criminal justice system is therefore deluged with offenses, many of a petty nature. It is very ineffective as a deterrent and is becoming prohibitively costly. As the criminal justice system is not capable to handle the flood of crime, people turn increasingly to ways of protecting themselves (Felson & Boba, 2010).

In the wake of diminishing role played by legal and societal inhibitors, routine precautions taken to guard crime by individuals and organizations is a third prohibitive system that is becoming important with the passage of time. Routine precautions include locking doors, securing valuables, counseling children, and guarding purses and wallets to decrease the risk of crime. People's tendency to buy houses in safe neighborhoods, invest in burglar alarms and firearms and avoid threatened places and people is also part of the routine precautions. Similarly, schools, factories, offices, shops, and many other organizations and agencies routinely take a host of precautions to safeguard themselves, their employees, and their clients from crime (Felson & Boba, 2010).

In its emphasis on the routine precautions, the theory implies situational crime prevention to be the best strategy to control crime. CJS around the world are increasingly focusing on the situational prevention strategies which can be accounted for as the popularity of the theory. The theory is also a subject of many empirical studies in recent times (e.g. Clarke & Newman, 2006; Kriven & Ziersch, 2007; Farrell et al. 2011b; Fujita & Maxfield, 2012; Tilley et al. 2015a; Ours & Vollaard, 2016; and Tseloni et al. 2017) with findings mostly compatible with the theory's predictions (note,

however, that majority of the empirically studies tests the impact of improved car security measures on car lifting. Subjecting the theory to diverse crimes, mostly violent, are likely to render the theory's implications false). There are, however, several limitations in the theory. First, the theory makes no attempt to explain criminality. As Akers (1997) observes, the theory simply is a way of clarifying why people become victims of crime. It is unable categorically to defend why it is that some people are involved in criminal behavior and others are not. In effect, the routine activity theory is a pre-destined actor theory (Burke, 2013). Hence, the theory's implication for crime control policy in the form of routine precautions can cause various types of negative externalities. Routine/situational precautions may cause various types of crime displacements (Bowers & Johnson, 2003). It may also induce criminals to attack less protected areas and people (Heal & Kunreuther, 2007; Antoci et al., 2017).

The theory is also incompatible with many other theories including economic models of crime. That is, if self-protection in the form of routine precautions reduces the probability of victimization and given that self-protection is a direct function of income (as is the case according to Allen, 1996 and Chintrakarn & Herzer, 2012), then crime should be negatively (positively) associated with income (poverty). More specifically, inequality in income distribution, on balance, should have no effect on crime as motivations created by poverty should be counterbalanced by inhibitors created by income. But this would contradict many theories and a great many empirical findings.

3.2.5 Social bond-control theories

3.2.5.1 Hirschi's social bond theory

Social controls theories consider criminal behavior as a choice, a choice that is based on costs, benefits and opportunities (Seddig, 2016). The theory implicitly assume that individuals are held back from criminality by the social control that is imposed upon them (Gilling, 1997). Jackson Toby (1957) can be considered as the first theorist in this tradition who also championed the term "stacks in conformity". He argued that all youths are motivated to break the law, but some youth risk more than others when they give in to those motivations. Youths who do a fine job in school not only risk being punished for breaking the rules and laws, but they also jeopardize their careers. Thus, they have high "stakes in conformity." In contrast, youths who do poorly in school risk only being punished for their offense, since their prospects are already dim in terms of career. So, they

have less to lose when they break the law. On balance, then, youth with low stacks in conformity are expected to break the law more than those who have higher stacks in conformity.

Nye (1958) followed Toby but rather focused on parental control as the most important source of social control. To Nye, most delinquent behavior results from insufficient social control. It was, however, Hirschi (1969) who studied the impact of social control on criminality in minute details. To Hirschi (1969), every one of us is bound to criminality but are kept within the legal limits by the fear of losing important relationships with valued ones.

Hirschi says that the social bond a person maintains with society is divided into four main elements: attachment, commitment, involvement, and belief. Attachment refers to a person's sensitivity to and interest in others. Hirschi point out parents, peers, and schools as essential social institutions with which a person should maintain ties. Due to lack of such attachment, feelings of respect for others in authority are less likely to develop. Commitment involves the time, energy, and effort expended in conventional lines of action, such as getting an education and saving money for the future. If people build a strong commitment to conventional society, they will be less likely to involve in acts that will jeopardize their hard-won position. Heavy involvement in conventional activities (schools, sports, community etc.) leaves little time for illegal behavior. If beliefs (i.e. honesty, morality, fairness, patriotism, responsibility) are absent or weakened, individuals are likely to participate in antisocial or illegal acts.

In a subsequent reformulation of the theory (which is also renamed as general theory of crime), Hirschi & Gottfredson (2001) shifted their attention from social control to self-control. Self-control is the power in individuals to control one's emotions and temptations. People low in self-control are impulsive; insensitive to other people's feelings, physical (rather than mental), risk-takers, shortsighted, and nonverbal. According to Hirschi & Gottfredson (2001), self-control is established in the early age and is relatively stable over the life course. In effect, once developed, self-control in insensitive to external forces such as social and legal controls (Piquero, 2010).

Social control and its revised form theory have attracted a considerable body of empirical literature. Carneiro, Loureiro & Sachsida (2005) studied whether social interaction has any influence on the criminal behavior of convicted prisoners in Brazil. Controlling for several other variables such as family income, marital status, age, education and severity of sanctions, the study findings are mixed with respect to social interactions and criminal behavior. Family relationships

and marriage deterred rape but have no effect on other crimes such as homicide, drug dealing and robbery. Seddig (2016) also reported mixed results. The author studied the impact of school bonds and legal norms on delinquent behavior and found that school and teachers' bond and the acceptance of legal norms all effect delinquent behavior. But acceptance of legal norms is a direct and proximate predictor than school and teachers bond which effects delinquent behavior only indirectly.

Yuksek & Solakoglu (2016) analyzed the effects of parents, school and peer bonds on the propensity to commit delinquent acts. The study found that parental and school attachment negatively influenced the propensity to skips school without a legitimate reason, to use implicit substances, to use physical aggression towards others, and to violate rules. However, attachment with delinquent peers affected all propensities positively.

Valdimarsdottir & Bernburg (2015) empirically evaluated the impact of social ties among neighborhood parents and adolescents' commitment to social norms to delinquency. The principle variable in their study is concentrated disadvantage which is a composite index having as indicators; neighborhood economic status, the number of single parent households registered in the neighborhood, and proportion of parents that are registered as foreign nationals in the neighborhood. Their results show that concentrated neighborhood disadvantage has a substantial, contextual effect on delinquency in ice land. Adolescents belonging to neighborhoods that are high in concentrated disadvantage (i.e., have a high proportion of low-income families, single-parent households, and immigrant parents) report more delinquency, net of their personal family and economic situations. However, the study finds no such effect of neighborhood residential instability on delinquency.

Schulz (2016) studied the revised social control theory by focusing on the relationship between self-control and violence. The study reported that low self-control interacts with provocations to produce violence. A similar study by Curcio, Mak & George (2017) also tested the revised control framework by including psychological variables such as peer risk-taking behaviors, impulsivity and sensation seeking. The study found that social control variables such as school attachment, parental attachment and peer risk taking behavior explained a significant portion of variations in delinquency across all age cohorts. Personal control variables, i.e. impulsivity and sensation seeking, however explained variations in delinquent offending amongst young participants only.

The theory has gathered good empirical support in recent times but by focusing on attachment, commitment, and involvement, the theory's focus is on the distant factors than the more proximate factors. Attachments and commitments are no doubt important for determining an individuals' human and social capital and is also a source of informal social control. Similarly, involvement also affects opportunities as Hirschi himself agrees. But the sole focus on these variables at the cost of ignoring the role of CJS variables altogether is not right. As Seddig (2016) has reported, controlling for acceptance of legal norms may render a very weak and insignificant impact of attachments on delinquent behavior.

3.2.5.2 Age graded social control theory

Age graded theory by Sampson & Laub (1993) is another theory in the control tradition. Although the theory is mentioned under developmental theories in many text books (e.g. Seigel, 2016; Bernard et al., 2015), it is being included here due to its emphasis on social control. The theory has three components, connecting to the life stages of the individual. The first component deals juvenile delinquency; the second traces behavioral transitions undergone as juveniles become adults; and the final component exposes adult criminal behavior. Juvenile delinquency, argue Sampson and Laub, is best explained by the individual's family context, and by his or her school, peers, and siblings. The most essential family context factors affecting delinquency are erratic and strict discipline by parents, mother's lack of supervision, parental rejection of child, and child's emotional rejection of parents. These family elements may be influenced themselves by structural characteristics, such as a crowded household, low family socio-economic status, high residential mobility, parental criminality, family disruption, family size, foreign-born status of the family, and the mother's employment status. The effect of these structural variables on delinquency is indirect, as they are mediated by the process variables (such as harsh discipline). These structural factors are also expected to influence variables that relate to one's school, peers, and siblings. Disadvantaged structural conditions may give in weak attachment to school, poor performance in school, attachment to delinquent siblings, and attachment to delinquent peers. All these may in turn enhance the likelihood of delinquent behavior.

The rest of the age graded social control theory discusses solidity and variation in the life span of delinquent individuals. According to Sampson & Laub (1993), most delinquent individuals turns into adult criminals because their early criminal behavior closes the doors for positive change and

adult social bonding. They, however, do not completely dismiss the possibility of positive changes. Positive changes in the life course are possible if, as an adult, one develops positive social capital. Sampson & Laub (1993) defines positive social capital as attachment to spouse, job status and commitment, dependence on an employer and other such elements. Thus, and even though juvenile delinquency negatively influences adult social capital, the development of social connection as an adult can reduce the likelihood of crime, independent of one's childhood experiences.

Empirical tests of the age graded social control theory predominantly are based on the relationship between age (Wiesner et al., 2007; Monahan et al., 2009; Capaldi et al., 2016), education (Swisher & Dennison, 2016), employment (Lageson & Uggen, 2013; Verbruggen et al. 2015), parenthood (Savolainen, 2009; Kreager et al. 2010; Kerr et al. 2011; Monsbakken et al. 2012; Zoutewelle-Terovan & Skardhamar, 2016), marriage (Sampson, Laub & Wimer 2006; King, Massoglia & Macmillan 2007; Bersani & Doherty, 2013) and desistance from crime. Although the results from these studies are mixed, but even if we assume that all studies report the desired results, these can be subjected to several interpretations other than desistence due to turning points. For example, the findings that aging reduce criminality may be due to diminishing criminal capital, or perhaps it is because of specific deterrence and so on. Moreover, the evidence that desistence to crime is due to education, employment, marriage, and parenthood do not necessarily imply cause and effect relationship. As is observed by Skardhamar et al. (2015, p. 426), "*in order to demonstrate causality, the evidence should rule out social selection as the alternative account of the negative association between marriage and crime. The social selection hypothesis posits that marriage is associated with desistance because individuals who have "cleaned up their acts" that is, matured out of crime, are more likely to marry than those who persist in crime. Evidence that fails to rule out this interpretation does not demonstrate causality. Up to the extent that marriage is affected by individual self-selection, the marriage-crime relationship is potentially spurious"*.

Moreover, the opportunity of most of the turning points such as marriage, employment, and higher education depends on personal human and social capital. The theory argues that delinquency is determined by negative childhood experiences at home, school and with peers. Individuals having negative childhood experiences are very remotely likely to develop human and social capital that is required for a positive turning point (such as employment, marriage, education and parenthood). Theoretically, then, it is impossible to imagine a youth without human and social capital to suddenly develop those in adulthood. To be more specific, human and social capital are not jump

variables but are developed overtime. In the absence of human and social capital, marriage, parenthood and pursuing higher studies may increase economic responsibilities and may be, instead, criminogenic (Broidy & Agnew, 1997; Zoutewelle-Terovan, & Skardhamar, 2016).

3.2.6 Strain/Sub culture theories

3.2.6.1 Merton's strain theory

Merton (1938) theory states that the causes of crime are not specific to individuals or groups of individuals but to culture and society (Gilling, 1997). Merton first distinguishes between culturally accepted goals (such as material possessions, symbols of status, accomplishments and esteem) and the institutionalized means to obtain these goals. Strain theory says that crime is a function of the disequilibrium among the goals people have and the means they can use to find them legally. Most people in the United States desire wealth, material possessions, power, prestige, and other life comforts. Although these social and economic values are common to people in all economic strata, Merton says that the ability to get these achievements is class dependent. Members of the lower class are not capable to hold these symbols of success through conventional means. The lack of formal education and other economic resources are responsible to obtain the culturally aspired goals. Consequently, they feel anger, frustration, and resentment which are referred to as strain. Lower-class citizens either can accept their status and live out their days as socially responsible, if unrewarded, citizens or they can choose other ways of achieving goals, such as theft, violence, or drug trafficking.

3.2.6.2 Theory of delinquent subculture

Another version of the strain/sub-culture theories is that of Cohen's (1955) delinquent subculture. Cohen's central preposition was that delinquent behavior of lower-class youths is actually a protest against the norms and values of middle-class culture. According to Cohen, the development of the delinquent subculture is a consequence of socialization practices found in the ghetto or inner-city environment. These children have no basic skills necessary to get social and economic goals in the demanding society. They have no such education and therefore do not have the skills on which to gain a knowledge or socialization foundation. He suggests that lower-class parents are not able of teaching children the essential techniques for entering the dominant middle-class culture. The outcome of this deprivation includes developmental handicaps, poor speech, poor communication skills, and inability to delay gratification. Since these conditions make the youth of lower class

incapable of getting goals legitimately, they experience a form of culture conflict that Cohen calls status frustration. As a result, many of them support each other's in gangs and involve in behavior that is "non-utilitarian, dangerous, and negativistic.

3.2.6.3 Theory of differential opportunities

Yet another variant of the sub-class theories is the differential opportunities theory by Cloward & Ohlin (1960). The centerpiece of the Cloward and Ohlin theory focuses on the differential opportunity, which says that people in all strata of society hold the same success values but those in the lower class have specific ways of achieving them. People who perceive themselves as failures within conventional society will seek other innovative ways to achieve success. People who say that there is a hope for advancement by illegal ways may join hands with like-minded peers to form a gang. Gang members provide the emotional support to deal with the shame, fear, or guilt they may develop while involving in illegal acts. Delinquent subcultures then reward these acts that conventional society would punish. The youth who is considered a failure at school and is only qualified for a menial job at a minimum wage can earn thousands of dollars plus the respect of his or her peers by joining a gang and participating in drug deals or armed robberies.

Merton's theory (and all other sub-culture theories) has been most closely scrutinized by the researchers and several problems have been identified. First, Merton's stress on the shared goals and the unequal distribution of means is misplaced. With respect to shared goals, several cases can be identified where goals may differ across gender (Taylor & Leonard, 1983) and age (Seigel, 2016). Achieving these diverse goals is not a matter of social class alone; other factors, including athletic ability, intelligence, personality, and family life can either hinder or assist goal attainment. Thus, neither goals are shared by the entire society nor the means to acquire these are class dependent. Second, Kornhauser (1978) described the central element of "strain" theories as the assertion that stress or frustration causes crime and delinquency. The source of this stress or frustration was said to be the "gap" between what criminals and delinquents want (aspirations) and what they expect to hold (expectations). She then argued that strain in this sense is evenly spread throughout society and is not greater among the poor. This is because, no matter how rich people are, they always want more than they can get.

3.2.7 Victimized actor theories

The victimized actor theory was first developed by Tannenbaum (1938) and Lemert (1951) and later popularized by Becker (1963, 1966, 1973). The theory's focus is on three interrelated things. First, it considers why some acts are defined as criminals while others not, despite having similar characteristics (Gilling, 1997). The second concern of the victimized actor theories is that why certain individuals are more likely to be labelled criminals than others. The third but the most important concern of the theories is that how labelling experience effects the recipients (Burke, 2013).

The theory detaches itself completely from the causes of primary deviance – these causes can be societal, or psychological (Lemert, 1951) – but primary deviance is considered as a temporary deviation from the acceptable social roles. These primary deviances, however, assume importance when social reactions in the form of name calling, stereotyping or labelling repeatedly stigmatize the individual as criminal. The person involved in primary deviance may initially resist the labeling but eventually may accept the deviant status conferred upon him by the social control agencies. Once such a status is accepted, the individual becomes secondary deviant. Depending on the visibility of the label and the manner and severity with which it is applied, a person will have greater commitment to a deviant career (Seigel, 2016).

The early labeling theorists predominantly blamed the criminal justice system as having the monopoly to label various individuals as criminal. The later formulation (e.g. Matsueda, 1992 and Heimer & Matsueda, 1994), however, consider other agencies of social control as equally capable of labeling an individual as criminal. Accordingly, and besides the criminal justice system, these later formulations of the labelling theories consider parents, friends and teachers as other sources of labeling which has an equally important effect on subsequent criminal behavior. These are the informal labels which affect the subsequent degree of crime committed by individuals because these supports shape their perceptions of how others see them. Hence, if they believe that other people observe them as law violators and troublemakers, they are more likely to act in accord with this perception and engage in offending behavior (Burke, 2013).

Labeling theories are subject to many criticisms. First, labeling theorists sometimes have exaggerated the importance of the official labeling. Second, labeling theory normally portray the deviant as resisting the deviant label, and accepting it only when it can no more be avoided. Though

this may be true in some cases, in others it would seem that the deviant identity is actively sought and that the person may form a deviant identity without ever having been officially or unofficially labeled. Third, it is generally said that for the typical law-abiding member of society who has a noncriminal self-image, the labeling or stigmatizing function of the criminal court is the primary technique of social control and is much more important than the actual imposition of the punishments (Zimring & Hawkins, 1973). The average citizen is deterred from committing most crimes because he or she fears the conviction itself rather than the punishment related with it. Reducing the stigma or labeling effects of the criminal court could possibly lead to an increase in the incidence of criminal behaviors and to an increase in the imposition of other, harsher punishments for those behaviors. So, the actual question is not whether the labeling function creates crime, but whether it makes more crime than it removes. Although this is a very complex question to evaluate, it seems probable that labeling does not create more crime than it eliminates (Tittle, 1975; Bernard et al., 2015).

Most of the above criticisms are valid, especially the one that deals with the deterrence effect of labeling. It is well established that, once labelled, reintegration in the society is a difficult process. The individual may lose human and social capital as a result of criminal labeling, employers may find it hard to employ a person who has a criminal identify and so on. But if criminals are somehow rational, then such prospects will effectively deter their criminal tendencies. Having said that, labelled individuals if faced with such discrimination may find it hard to resist further offending. Although Tittle (1975) may be correct in stating that labeling does not create as much crime as it eliminates, but the activities of secondary and career criminals are more severe than those of the primary deviants. Therefore, the main question is not whether labeling makes more criminals than it stops, but whether it creates more serious criminals then it eliminates.

3.3 Economic models of crime (RAM)

Besides economic models of crime, many contemporary theories explaining crime and criminality can be regarded as rational choice theories (in the sense that free well is accorded its due place in decision making). The major difference between economic models of crime and other theories discussed in this literature review centers around which of the two sets of factors are more important; dispositional/background factors or the individual's decision-making calculus. Many of the other theories discussed above, for example, accept that individuals exercise their free will

in choosing their acts, but the central variables explaining their behaviors are dispositional/background. On the other hand, many of the economic models of crime accepts that dispositional/background factors do have a role but it ultimately boils down to the individual to exercise his free well and decide (Barlow & Kauzlarich, 2010). In effect, while most of the other theories ignore the role played by the criminal justice system in prohibiting crime (Matza, 1964), the economics models of crime consider it to be the principle policy variable which can affect criminal motivations in the most desirable ways.

To begin with, the economics model of crime is based on the utilitarian philosophy of Beccaria (1764) and Bentham (1789). Both philosophers advanced the notion of free will and that human beings are pleasure seeking. That is, individuals are induced by gains but they avoid pain. These philosophers argued that criminal behavior is the output of rational calculation involving costs and benefits related with the criminal act. A basic calculation arising from this is that people are likely to commit crimes if the pleasure (perceived benefits) from the behavior outweighed the pain (perceived costs) (Barlow & Kauzlarich, 2010). Thus, to control the hedonistic tendencies of individuals, these classical philosophers advocated punishment as a way to increase the cost side of the calculus. Punishment for crime was thought to work best as a deterrent if it was (a) certain, (b) proportionate to the harm caused by the crime, and (c) swiftly imposed. If these conditions were met, it would reduce the probability of an individual committing a crime. That is, the realization that offenders are caught and punished (certainty) soon after committing the crime (swiftness), and if the punishment mirrors the seriousness of the crime would deter potential offenders. Beccaria and Bentham considered severity to be the least important deterrent. Bentham, however, believed that for some people the pull of hedonism was much stronger than for others (Gilling, 1997). Besides punishments, he advocated several schemes such as education and employment to eliminate criminal tendencies from such individuals (Dinwiddy, 1989).

The classical rational actor model, however, was formalized and popularized by Becker (1968). Becker considered participation in criminal activities as a gamble whose expected returns depends on whether or not the participant is detected, apprehended and punished. If the participant in the gamble is detected, arrested and punished, then the expected returns from the gamble are reduced by the size of the penalty imposed upon him. Since the probability of detection and apprehension is less than 1, and that the imposition of penalty is conditional upon detection and arrest probability,

the individual may enjoy the full returns of the gamble if not detected. The individuals' decision whether to participate in this gamble or not depends on the gamble's expected returns. If the expected returns from the gamble are greater than that of a sure income, then the individual is likely to participate in the gamble.

Hence, there are four central variables in the Becker's (1968) model. These variables are: probability of detection and arrest, severity of punishment, and returns from legitimate and illegitimate activities. Both probability of detection and severity of punishment is a tax (cost) on the expected returns from participation in illegal activities and hence an increase in both should discourage participation in illegal activities. An increase in the expected returns associated with illegal activity is a bonus (benefit) and is expected to increase participation in illegal activity. Income from legal activities, on the other hand, should be inversely related with participation in illegal activities. Education and employment are important in the model to the extent that these may affect income from legal sources.

Allingham & Sandmo (1972), Ehrlich (1973), Kolm (1973), Singh (1973), Block & Heineke (1975), Heineke (1978), Witte (1980) and more recently Nagin, Solow & Lum (2015) developed variants of the Becker's (1968) model but the central variables and their impact on illegal activities remained almost the same (however, while the rest of the models assume rationality of individuals in the traditional economic sense, Nagin, Solow & Lum (2015) relaxes the assumption of strict rationality and assume it to be of bounded type which is affected by environmental, situational and individual factors).To sum up the comparative static results of theoretical models except Nagin, Solow & Lum (2015), the rational actor models implies that; an increase in the probability of arrest has, regardless of the sign of the attitude toward risk, a negative effect on the supply of crime. For any attitude toward risk in Becker's model, an increase in the severity of punishment has a negative effect on the supply of crime. In the rest of the models, the severity part of the deterrence hypothesis depends on the question of attitude toward risk. The effect of more severe sanctions is particularly unclear for risk lovers, whereas risk averters in most models offend less when sanctions increase.

The rational actor model is by far the most popular one to guide empirical research. Its theoretical foundations are however subject of heated debate over the years. Traditional theories of crime, other than the rational actor model, suggest that individuals' personal (age and intelligence) and

social (various characteristics of society) environment has a momentous impact on his preferences. By assuming a rational man of the utilitarian thought, the rational actor model effectively separates the individual from the social environment (Gilling, 1997). The rational actor model agrees that personal and social environment effects individual behavior, but it is the individual that takes the ultimate decision and hence his personal and social characteristics could be ignored (Barlow & Kauzlarich, 2010). The exercise of free will and the authority of an individual to decide are not deniable, but there are certain factors which hinders the exercise of free will (Burke, 2013). This implies that criminal decision making involves environmental factors (norms and values) as well as situational factors (e.g. deterrence). Hence doing away with the theoretical constructs that are at the heart of social theories of crime would render the theory week (Matsueda, 2013; Loughran et al. 2016).

Becker (1976) agrees that preferences can vary by saying that, "*Since economists generally have little to contribute, especially in recent times, to the understanding of how preferences are formed, preferences are assumed not to be very different between wealthy and poor persons, or even between persons in different societies and cultures (Becker 1976, p. 5).*" This assumption enables the evaluator to test other parts of the theory (e.g. hypotheses about the effect of sanctions, and of gains and losses of legal and illegal activities). If preferences differ among individuals, estimates of the effects of sanctions will be relevant for an "average" person" (Eide, Rubin & Shepherd, 2006). But given that crimes are mostly committed by a minority of the population, one is reasonably tempted to doubt the existence of such an average person. Moreover, given that faced with the same circumstances (at least with respect to law), some individuals commit crimes while others not imply that heterogeneity in population would be a more appropriate assumption in models of crime (Clarke & Felson, 1993).

Majority, if not all, of the crime causation theories are based on one of the two doctrines; human beings are born innocents but are corrupted by their circumstances (Rousseau, 1712-1778) vs human beings are born beasts but control makes them human (Hobbes, 1588-1679). The truth seems to lie somewhere in between but, given the centrality of punishment in the model; the rational actor theory is based on Hobbes (1588-1679) philosophy. This implies that human beings will violate the law whenever opportunity arises and will abide by the law only when they fear it. But this is an unrealistic assumption due to several reasons. First, no society is likely to survive if its citizens do not follow its rules whenever the risk of punishment is small enough to make

violation the optimal decision (North, 1982 & 1990; Margolis, 1991; Gaviria, 2000). Values, moral convictions and codes of conduct do matter and cannot in general be assumed away. Secondly, most of us do not commit crimes even when probability of detection is effectively zero. Similarly, there are people who would violate the law irrespective of the level of threat imposed by the probability and severity of punishment [10](Winter, 2008).

Most of the economics models of crime ignores the reactive nature of the police force and of the CJS. Crimes should be reported to them by the victims or by other community members before any action is taken by the police. Once a crime happens, the victim or the other community members will assess the costs and benefits of reporting the crime to the police. The victim will assess benefits from retribution and costs from retaliation. What if the perceived costs are greater than benefits? What if the offender and the community share similar beliefs? What if the mentioned crime is tolerated in the society? All these will reduce the probability of being reported and effectively should reduce the cost (or increase the benefits) of offending. The rational actor model has no answer for explaining situations like this. Apparently, there is no deterrence in operation here (Gibbons,1982).

The rational actor model also assumes that probability of detection is an exogenous parameter and its perceptions across population are the same[11]. But perceptions amongst the population regarding probability of detection can differ (Cook, 1977). Research has shown that perceptions about the probability of detection and conviction depends on, amongst other things, a person's education, own experience with the CJS, and on friends and peer's experiences. Such factors are thoroughly ignored in the rational actor model. The same case can be made with respect to severity of punishment, which is also assumed exogenous[12].

Last but not the least, the operation of both probability of detection and punishment assumes that there is no corruption. An offender is assumed to surely pay the penalty if detected and convicted. There are possibilities that the offender and any of the CJS agents (e.g. police) engage in a bargain

[10] Examples are the politicians and gang members who see prison term as a bonus, something that enhances their credibility.

[11] In Ehrlich (1973) empirical model, probability of detection and punishment are determined by resources of the CJS and the crime rate but both are exogenous in the theoretical model.

[12] The same punishment should cost different people differently. For example, rich people lose more, in terms of income and reputation, than poor people.

and share the penalty. Hence, it effectively reduces the impact of expected sanctions and increases participation in illegal activities.

Nagin, Solow & Lum (2015) model is a recent one and deserve separate mention. Besides taking care of the long-standing criticism of assuming away with the traditional form of rationality, the model is different from the rest in the sense that probability of detection is assigned an additional role. According to Nagin, Solow & Lum (2015), inspired by the situational crime prevention strategies, police deter crime in two ways. One way is the traditional deterrence which is associated with police clearance rates. The other role that the police plays is their sentinel role. For Nagin, Solow & Lum (2015), it is the sentinel role of police which is more important for crime prevention. Thus, their basic results advocate an increase in arrest risk through the sentinel role of police for attractive criminal opportunities over and above what is acceptable to the criminals for the given opportunity. The model has been severely criticized by Pickett & Roche (2016) on the grounds of several inconsistencies. Additionally, the theory's implication is that crime would cease to exist if police performs their sentinel role is quite right but its policy implication may not be practical due to multiple reasons. First, it assumes that the police are incorruptible which may not be true particularly in developing countries. Second, the sentinel role of police would require a police force large enough to oversee every person and every place around the clock. This may be too much of a burden on the public exchequer, especially in developing countries. Third, according to Nagin, Solow & Lum (2015), "its [the model's] parameters are unlikely to be amenable to empirical estimation" (p. 79). But a model's primary purpose is to serve empirical estimation as is observed, "*policy recommendations do not follow from theory but rather require empirical determination of relative magnitudes" (*Block & Heineke, 1975, p.323).

3.4 Empirical Studies based on the economics of crime

Generally, the empirical counterpart of the economics model of crime is specified as (Eide, Rubin & Shepherd, 2006);

$$C = f(P, S, Z_j) \qquad (3.1)$$

$$P = g(C, E, Z_k) \qquad (3.2)$$

$$E = h(C, Z_l) \qquad (3.3)$$

Where C is the crime rate, P is the probability of punishment, S is the severity of punishment, E is the per capita resources of the criminal justice system and Z_j ,Z_k ,Z_l are the vectors of

socioeconomic factors. Equation (3.1) is usually referred to as the supply of offences equation, equation (3.2) as the production function of the criminal justice system and equation (3.3) as the policy equation. Empirical studies based on the above specifications can be classified in many ways (for example, based on the level of aggregation of data, different measurements of variable used etc.). But the focus is this review is on the relative importance of the variables considered central by the economics model of crime in explaining variations in crime. Hence, the literature review below classifies empirical studies according to variables of interest in the economics models of crime. Although some of the studies cited below consider the whole set of variables suggested by the model in their empirical estimation, the procedure of focusing on one variable in this literature review facilitates an in-depth analysis of the variable and its association with crime. Studies included below are a representative sample of the total and in no way is an all-inclusive review of the studies. Besides classifying and discussing empirical literature by variables, the discussion that follows outlines empirical studies that support the relevant hypothesis followed by those studies that oppose the hypothesis. Studies that attempts to synthesize the divergent results and criticisms on the hypothesis are discussed subsequently.

3.4.1 Deterrence variables

Using aggregate data, the first major study appearing after Becker's theoretic article was Ehrlich (1973) and the most recent by Islam (2016). Ehrlich (1973) utilized data from all states of USA from 1940, 1950 and 1960 to study seven types of crimes. His results demonstrated that probability of detection has a statistically significant negative effect on all types of crime and, except for murder; not less for crimes against the person than for other crimes. The severity of punishment has the same effect, but here only about half of the estimates were statistically significant. Ehrlich (1973) measured crime rate as the ratio of known offences in a specific category to population, probability of arrest and punishment as the ratio of the number of known offenders in a specific category imprisoned to the number of known offences in that category, and severity of punishment as the average time spent by offender in state prisons.

Recent empirical research has mostly done away with Ehrlich (1973) probability measure as it is the subject of fierce criticism over the years. Most of the recent studies use police presence or police strength as a measure of the probability of arrest. Examples of studies using aggregate data and police presence or police strength as deterrence to crime and whose findings are in line with

the economics models of crime, include; Marvell & Moody (1996); Levitt (1998, 2004); Corman & Mocan (2000); Fagan et al., (2002); Tella, Edwards & Schargrodsky (2004); Rosenfeld, Fornango & Rengifo (2007); Evans & Owens (2007); Gould & Stecklov (2009); Yamamura (2009); Draca et al. (2011); and Islam, (2016). There is, however, a continuity of Ehrlich (1973) type empirical studies as well. Recent studies that defines clearance rate, following Ehrlich (1973), as the probability of arrest and punishment, and support the predictions of the economics models of crime, include; Machin & Meghir (2004); Evans & Owens (2007); Buonanno & Montolio (2008); Halicioglu, Andres & Yamamura (2012); Han, Bandyopadhyay & Bhattacharya (2013); Jabbar & Mohsin (2014); and Weatherburn, Halstead & Ramsey (2016).

Witte (1980) is the first study based on the economics model of crime that utilizes individual level data. The author collected data on post release activities from a random sample of 641 men who were in prison in North Carolina. The activities of the released prisoners were followed for a total of 36 months. Dependent variable, i.e. crime rate, is measured as the ratio of total arrests to convictions in the follow up period. Amongst the core variables suggested by the economics models of crime, probability of arrest is ignored since 80 percent of their respondents were rearrested during the follow up period. Witte, however, includes probability of conviction given arrest (the ratio of convictions to arrests) and probability of imprisonment given conviction (the ratio of convictions resulting in imprisonment to total convictions). The effects on crime of measures of both the probabilities and the severity of punishment are reported to be negative. Since the study of Witte (1980), several efforts have been made to evaluate the economic models of crime using individual level data (Examples of studies in this tradition and which support the deterrence hypothesis are; Travaglini, 2003; Matsueda, Kreager and Huizinga, 2006; and more recently Sloan et al. 2016). As with Witte (1980), these studies still somehow relied on the official statistics and respondents in all of the above studies are offenders known to the police.

Sociologists trained criminologists have long criticized the use of official statistics and advocated the use of self-reported methods to measure participation in crime. The use of self-reported measures, in testing the economics model of crime, is recent but generally support the model (Simpson, 2013). In a seminal study, Paternoster & Simpson (1996) found that the perceived costs of punishment, be that formal, informal or based on self-imposed shame, that are directed against the individual effectively deter corporate crime. Klepper & Nagin (1989) shows that both perceived detection risk and perceived prosecution risk were inversely related to the respondents'

willingness to involve in tax non-compliance. Although, they found that perceived prosecution risk had a threshold effect, such that an increase in perceived risk from zero to non-zero yielded greater deterrence after which further increases in perceived risk were inconsequential. Piquero et al. (2005) found that perceived certainty of informal sanctions is negatively associated with intentions to commit corporate crimes, but the perceived severity of formal sanctions was positively linked with corporate criminality. Smith et al. (2007) reported that among business managers, perceived formal sanction risk exerted a negative effect on intentions to offend through ethical evaluations and positive/negative outcome expectancies. Kroneberg & colleagues (2010) opined that the perceived probability of detection interacted with the perceived sanction severity and moral norms to influence intentions to commit tax fraud. Indeed, a meta-analysis of perceptual deterrence studies revealed that the deterrent effect of perceived sanction certainty was largest in the case of 'white-collar' types of offenses (Pratt et al. 2006).

The most comprehensive test of the economics model of crime using individual level data, to date, is the study of Loughran et al. (2016) (Pickett & Roche, 2016). Loughran et al. (2016) analyzed data from the Pathways to Desistance study and found that perceived probability of arrest and perceived severity of sanctions were both negatively related to self-reported offences. However, the perceived severity of sanction, although negative, was insignificant. Same was the case with the interactions between perceived probability of arrest and perceived severity of sanctions. Similarly, the study of Pickett, Loughran & Bushway (2016) also support, albeit indirectly, the deterrence hypothesis. Pickett, Loughran & Bushway (2016) studied that whether the deterrence hypothesis is conditional on communicating risk perceptions to individuals. Results from their experiments revealed that providing respondents with objective information about the probability of arrest for white-collar crimes decreased their perceptions of arrest risk. This, in turn, appears to have increased their intentions to commit the offenses described in the scenarios which indirectly supports the deterrence hypothesis.

The negative relationship between the criminal justice system variables, i.e. probability and severity of sanctions, and crime is not universally established. There are many influential studies, both at the aggregate and individual levels, that calls into question the deterrence hypothesis. Studies based on aggregate data and that directly address shortcomings in Ehrlich (1973) study, include; Forst (1976), Nagin (1978) and Brier & Fienberg (1980). These studies have reported

either null findings with respect to probability and severity of punishment and crime or very weak effects. However, there are very few recent articles that use aggregate data and oppose the negative effects of criminal justice variables on crime (examples include; Sever (2001) and Kollias, Mylonidis & Paleologou (2013)).

Individual level data are used predominantly by sociologist or psychologist trained criminologists who are not very receptive to including variables of legal sanctions. Such variables are considered too economic. Some of the individual level data studies that include both probability of arrest and severity of punishment finds one of these to be negatively related but the other are either positively or totally unrelated with the incidence of crime (e.g. see Myers Jr, 1983; Trumbull, 1989). Others who include measures of both formal and informal deterrence finds that formal deterrence have no effect on crime (e.g. see Bates, Darvell & Watson, 2017). It has been observed that perceptions about arrest and sanctions may depend on personal experiences (Anwar & Loughran, 2011; Horney & Marshall, 1992; Matsueda, Kreager & Huizinga, 2006) and may not be adequately communicated by either police presence or arrest data (Kleck & Barnes, 2014).

To synthesize the divergent findings with respect to legal deterrence, it is imperative to recall the main results of the economics models of crime. Most of the models predict a sure negative effect of the probability of detection on crime and, except Becker's (1968), the effects of sanctions depend on several other considerations, risk preference being one of these. Thus, if a sample constitute many risk lovers (such as offenders), then sanctions may not have the desired effect (Eide, Rubin & Shepherd, 2006). As Trumbull (1989) puts it, "*this result [no impact of probability of detection and severity of punishment on crime] is natural, since the sample consists only of individuals who, whatever the probability and severity of punishment, have chosen to engage in illegitimate activities*" (cited in Eide, Rubin & Shepherd, 2006, p. 221). A similar observation is also made by Bottoms & Tankebe (2012) who states that non-compliance with the criminal justice system may be found in some segments of the society.

In studies based on aggregate data, a null or positive effect could be attributed to omitted variable bias or inadequate considerations of endogeneity (Levitt & Miles, 2006). Studies using police presence or police strength assumes, as the model predicts, that more police would lead to less crime. Since reverse causality, i.e. more crime leading to more police, also exists (Winter, 2008), any study using police presence or strength and without properly tackling endogeneity is inevitable

to find its positive association with crime (Islam, 2016). Studies that have accounted for endogeneity report the predicted results. For example, Levitt (2004) uses instruments for police presence via expenditures allocated to firefighters and finds a negative relationship between police presence and crime (see also Levitt, 1998 and Atkins & Rubin, 2003). Evans and Owens (2007) find that an exogenous increase in police due to the enactment of a policing program reduces car theft, burglaries, robberies and aggravated assaults. Di Tella, Galiani & Schargrodsky (2004) isolate the causal effects of police on crime by examining the impact of an exogenous increase in police presence because of terrorism attacks in Buenos Aires, Argentina and find a negative relationship between police presence and crime. Draca et al. (2011) find a similar negative effect by examining the exogenous increase in police presence due to the terrorist attacks in London.

Studies based on deterrence mechanism have severely been criticized. Majority of these criticisms, except one, applies to studies based on official statistics. The one general criticism that applies to all empirical studies is that whenever the economics model of crime is subjected to test, it mostly includes formal sanctions at the cost of neglecting social sanctions and many other factors that constitute the utility function of individuals (Loughran et al., 2016).

Most of the empirical studies use crime rate (usually number of crimes reported to the police per thousand population) as the dependent variable in their empirical models. Such a measure of crime in the society may not be a true representative. The police force has the tendency to either show crimes rates relatively high (Benson, Kim & Rasmussen, 1994) or relatively low (Lab, 2010)[13]. These "dark numbers" are not destroying to empirical research if the rate at which actual crimes are traced is constant across regions (in cross-section studies) or over the years (in time-series studies) (Blumstein et al., 1978). The probability of detection and punishment are then measured as ratios (i.e. number of incarcerated persons in crime category X/Number of total reported crimes in category X), thus any error in the dependent variable is also transmitted to the explanatory variables (but in the opposite direction). If the reported crime rate is higher than actual it would cause both probability and severity of punishment to be underestimated and vice versa. If a study is based on aggregate cross sectional or panel data with some areas overestimating true crime rates and other underestimating it, it would create a spurious correlation between crime rate and the

[13] Empirical research has shown that under reporting is inversely associated with the level of development. Moreover, reporting depends on the severity of crime committed and stigma attached to the criminal. Thus small valued property crimes and sexual crimes are least reported (Fajnzylber, Lederman & Loayza, 2002; Soares, 1999).

deterrence variables (Cook, 1977; Viscusi, 1986)[14]. Moreover, studied based on police data also suffer from non-representatives in another important aspect. Such studies are based on only a sub sample of the population (convicted offenders) and hence are highly non-representative (Eide, Rubin & Shepherd, 2006).

Empirical studies based on aggregate data usually use the dependent variable "crime rate" as a sum of all crime rates (e.g. murder, theft, harassment) or separate categories as violent and property crimes. There are two problems with this practice. It is well known that not all crime categories are equally sensitive to the variables considered in most empirical rational actor models (e.g. Ehrlich, 1973 failed to substantiate that the crime of murder is responsive to deterrent variables). Second, such a lumping of crime essentially combines crimes committed by adults and youth offenders. Since CJS do not treat the two categories likewise; it is unreasonable to lump the two and expect that deterrent and other variables will have the same effect.

Even worse than this is the fact that more certain and severe punishments reduce crime by two very different mechanisms. First, as is usually understood, certain and harsh punishment increases the potential cost of crime and hence reduce the probability of engaging in criminal activities. Second, crimes that are punished leniently would cause people to consider these less serious and adjustment in norms will take place accordingly. As a result, commission of that particular crime would increase but it is difficult to isolate the effects of norm formation from that of deterrence variables (Eide, Rubin & Shepherd, 2006).

An empirical result that crime rate and measures of probability of detection and conviction are inversely related do not necessary implies deterrence. This is because one has to identify whether this inverse relationship is due to deterrence or due to crowding effect (Bar-Gill & Harel, 2001; Eide, Rubin & Shepherd, 2006). Deterrence is in operation when the higher probabilities of detection and conviction reduce crime. The crowding effect, on the other hand, is in operation when increasing crime rates (while holding probabilities of detection and conviction constant) renders lower probabilities of detection and conviction. In practice, it is almost impossible to isolate the deterrence effect from crowding effect in studies based on aggregate data (Taylor, 1978; Bar-Gill & Harel, 2001).

[14] For a mathematical proof, see appendix 2.

Legal sanctions discourage criminal activities in two distinct ways; specific deterrence and general deterrence. Specific deterrence implies the impact of actual punishment on those who violate laws. General deterrence, on the other hand is the deterrence that results from the perceived risk of detection and punishment. Since specific deterrence, such as incapacitation, works, it is very difficult in empirical studies to isolate the effects of general deterrence from the incapacitation effects (Winter, 2008). To separate general from specific deterrence, one must look out for variations in laws that effect one, but not the other variable (see Levitt, 1998b and Kessler & Levitt, 1999 for the type of exogenous variations that could help isolate general deterrence from specific deterrence).

It has also been observed that empirical research based on official macro-data cannot explicitly assess the deterrent effects of police activity because it cannot clearly measure perceptions of risk among potential offenders. Majority of the empirical studies based on official statistics assume that arrests rate (police activity) is directly related to individual's perception about arrest and punishment risks. In recent years, a considerable number of scientific research articles suggests that actual risk of punishment has either no relationship with the perceived risk of punishment (e.g. see Lochner, 2007; Kleck & Barnes, 2013, 2014) or that individual's overestimate actual risk (Piquero & Pogarsky, 2002; Pogarsky & Piquero, 2003; Loughran et al., 2014).

Lastly, empirical studies do not account for corruption or rent seeking behavior of police that can potentially undermine the true risk perceptions (Bowles & Garoupa, 1997). Corruption can take two forms: bribery, where law enforcers accept payments in return for not reporting crimes or apprehending offenders, and extortion, where law enforcers demand payments for not falsely accusing individuals. Both types of corruption are likely to increase crimes. Bribery reduces deterrence by lowering expected penalties, since by definition the bribe payment is less than the potential sanction. Extortion minimizes deterrence by reducing the difference in the net payoffs between criminal activity and non-criminal activity. The government and law enforcement may also involve in rent seeking behavior that does not maximize social welfare. The motivation under rent seeking is to maximize the sum of revenues minus the harms to the government and expenditure on law enforcement. Since a rent seeking government primarily care for revenues and ignores harm to non-government victims, it will set expected penalties for major crimes too low and hence will under-deter these crimes. On the other hand, it will set expected penalties for minor

crimes too high to increase revenue from little bit violations, and hence will over-deter these crimes from a social welfare perspective (Eide, Rubin, & Shepherd, 2006).

3.4.2 Unemployment-Crime (U-C) nexus

Unemployment is not a variable that directly stems from either Becker (1968) or Ehrlich (1973) theoretical models. Most empirical studies include unemployment as a proxy for the lack of legal income opportunities. Unemployment is likely to make crime (at least property crime) more attractive if the alternative is a life in poverty. From the theoretical perspective, income (legal or illegal) deserved to be discussed immediately after the deterrence variables. Discussing unemployment before income variables is however incited by two factors. First, unemployment is by far the most empirically studied variable after deterrence. Second, and most importantly, unemployment and deterrence variables are interrelated and so a discussion of unemployment immediately after deterrence variables will make comparisons easy.

In the economics model of crime, unemployment has no direct impact on the level of crime but effects crime indirectly through its effects on legal income. Since, employment is directly related to income, unemployment is expected to affect crime rates by making illegal income opportunities more attractive. This hypothesized positive effect has been studied extensively. Examples of macro level studies that verifies the hypothesis are; Papps & Winkelmann (2000); Carmichael & Ward (2001); Raphael & Winter-Ebmer (2001); Gould, Weingerb & Mustard (2002); Edmark (2005); Buonanno & Montolio, (2008); Altindag (2012); Halicioglu, Andres & Yamamura (2012). All these studies consistently report positive correlation between unemployment and (property) crimes. Moreover, unemployment amongst young population is reported to be more criminogenic than adult unemployment (e.g. see Carmichael & Ward, 2001; Buonanno & Montolio, 2008).

The relationship between unemployment and crime at the individual level is more supportive of the hypothesis than the macro level studies (e.g. see Uggen & Wakefield, 2008; Verbruggen et al., 2015; Merlo & Wolpin, 2015). As in macro studies, unemployment among young is found to be more criminogenic than adult unemployment (e.g. see Farrington et al., 1986; Fergusson, Horwood & Woodward, 2001). Furthermore, research has shown that being employed is correlated with minimum recidivism rates in samples of ex-offenders (Uggen, 2000; MacKenzie & De Li, 2002; Savolainen, 2009). Similarly, the available research on women has suggested that the crime-reducing effect of employment pertains to both male and female offenders (e.g., Uggen &

Kruttschnitt, 1998; Griffin & Armstrong, 2003; Verbruggen et al., 2015). Besides the direct impact of employment on crime reduction, several other characteristics of employment that may moderate the impact have also been studied at the individual level (Uggen 2000; Webster et al. 2007). Amongst these moderating variables, employment providing higher wages, satisfaction, and chances for advancement are reported to be more likely to reduce crime (Wadsworth 2006; Engelhardt, Rocheteau & Rupter 2008; Cox, 2010).

Recent empirical studies at macro-level have generally opposed the direct U-C relationship. That is, recent macro level studies either finds no significance relationship between unemployment and crime (e.g. see Fallahi & Rodriguez, 2014 who reported no significant relationship between unemployment, burglary, larceny and robbery), or a different short run and long run impact (e.g. see Phillips & Land, 2012 and Anderson, 2012 who reported unemployment to be positively correlated with crime in the short run but negatively in the long run). There are still other studies (e.g. Kollias, Mylonidis & Paleologou, 2013; Han, Bandyopadhyay & Bhattacharya, 2013; Jabbar & Mohsin, 2014) who reported a negative association between unemployment and crime rate. The last type of studies, i.e. who report negative U-C relationship, use either crime types others than property (e.g. Jabbar & Mohsin, 2014) or overall crime rates.

This discrepancy in results with respect to U-C relationship however, is not generally found in studies based on individual level data. In literature search, only two studies have been found that consistently report negative U-C relationship. The first study is by Trumbull (1989) who used data on 2000 offenders released from prisons in North Carolina to study recidivism and finds that unemployment is negatively related with crime. The second and recent study is by Piquero, Piquero & Weisburd (2016) who analyzed the effects of social and personal capital on white collar crimes. Employment in the study is considered as one of the personal capital. The results of the study imply that unemployment is negatively related to white collar crime. This result is however natural as unemployed individuals generally do not have the chance to commit white collar crimes.

Several explanations have been forwarded for the counter-intuitive U-C relationship. First, the negative U-C relationship may emerge due to availability of unemployment compensations. In some areas unemployment insurance is only slightly below ordinary legal income, and some of the formally unemployed receive income from short-term jobs. This explanation is tested by Berk, Lenihan & Rossi (1980) with null findings. That is, unemployment benefits reduced the probability

of offending in the short run but in the long run, due to negative work incentives, the probability of offending increases.

A second explanation is forwarded by Ruhm (1995) which is based on the income effect of unemployment. That is during recession the purchasing power of individuals is adversely affected. As a result, people may reduce purchases that are directly related to crime. For example, reduction in consuming drugs and guns (which are directly related to crime) may reduce crime. Similarly, people may purchase very few valuables, as a result of unemployment, that are attractive for criminals to steal (Winter, 2008). Thus, unemployment should lead to less crime if the income effect is strong enough to discourage purchases of things that are directly related to crimes.

The third explanation for the ambiguous U-C relationship is put forth by Cantor & Land (1985) and Cook & Zarkin (1985). They stated that the positive U-C relationship is triggered by two associated things. First, during recession (when unemployment is high), the opportunity cost of crime and the legitimate chances of earning income both deteriorate. So, the number of property and violent crimes escalate; they called this the motivation effect. Second, recession might cause a reduction in policing due to lower tax revenues of governments. The results of this change might be a lower chance of crime detection and punishment; hence, it might also increase the crime rate. The negative U-C relationship during recession, on the other hand is facilitated by the decline in the number and quality of criminal opportunities (Cook, 2010), because most people remain at home, which increases the guardianship of properties, so the number of burglary victims would decrease. The same could be said for the robbery because people carry less cash, and as Cook (2010) stated, they have more tendencies to defend what they have. Cantor & Land (1985) called this the opportunity effect. Motivational and opportunity effects would produce ups and down and fluctuations in crime rates. Consequently, the net effect of unemployment as an indicator of bad economic conditions on crime is ambiguous.

Cantor & Land (1985) argue that empirical studies can differentiate in the two types of effects. The "motivation" effect, they argue, should be "lagged" by some period. People only experience the strong effects of unemployment after some period because of their own savings, support from their families and friends, and government programs such as unemployment compensation. On the other hand, the "opportunity" effect should occur immediately. As economic activities slow down, the opportunities to commit crime decline simultaneously with them. Thus, there should be no

"lag" in the effect of decreased opportunities on crime rates. The negative U-C relationship in the short run and positive in the long run in recent empirical studies (e.g. Phillips & Land, 2012 and Anderson, 2012) is usually attributed to opportunity and motivations effects respectively.

The positive U-C relationship is implicitly based on the assumptions of unskilled workers and street crimes. As Winter (2008) observes that white collar crimes are generally committed by employed individuals. Besides, the relationship between unemployment and crime is not unidirectional. Unemployment affects crime and crime effects unemployment. That is individuals having criminal records may find it difficult to find employment in the legal sector. Similarly, business activity may be adversely affected by crime in an area leading to relocation and unemployment. In both cases more crimes result in more unemployment.

3.4.2.1 Legal sanctions and unemployment

The discussion in the forgoing paragraph leads to very interesting issue. That is, if the positive U-C relationship exists, then more unemployment will lead to more crimes. But if the causality also runs in the reverse direction, i.e. more crime implying more unemployment (through experience with the criminal justice system) then punishment is criminogenic. Legal punishment's association with recidivist tendencies is recognized since long. In fact, the labeling perspective of Becker (1966, 1973) associates any experience with the criminal justice system as criminogenic (even with respect to minor offences and small fines). The effects of imprisonment on recidivism have been extensively studied. Imprisonment affects individuals either through demand side or supply side (Ramakers et al., 2014). The demand side effects are said to be in operation if, because of incarceration, the probability of finding a job in the legal sector is reduced. The supply side factors of incarceration work through three different mechanism; the individual may experience an erosion in his work skills (deterioration in human and social capital), the individual may develop criminal skills in the company of other criminals (development of criminal capital), and the individuals' attachment to legal work may also weakens. Both the demand and supply side effects should lead to more crime.

Several empirical studies have reported on the demand side effects of incarceration. For example, it is reported that many ex-inmates feel that their criminal record hinder their ability to find a job (Visher et al., 2011), whereas experimental audits confirm that employers are only half as likely to call back job applicants who report a prison sentence on their application (Pager, 2003).

Furthermore, in comparisons between ex-inmates and comparable non- incarcerated individuals, ex-inmates consistently exhibit employment probabilities that are approximately 10–15 percent lower (Huebner, 2005; Apel & Sweeten, 2010). Among employed ex-inmates, there is a comparable earnings penalty on the order of 10–15 percent, as well as modestly slower earnings growth over time (Western, 2002; Apel & Sweeten, 2010).

The supply side effects of incarceration have also been studied extensively. For instance, Nieuwbeerta et al. (2009) opined that first-time imprisonment increases the likelihood of subsequent criminal activity. Similarly, using data from Florida offenders, Bales & Piquero (2012) found that imprisonment makes a criminogenic effect on re-offending compared to non-incarcerate sanctions. This criminogenic effect is strengthened when incarcerating adolescents. For example, Loughran et al. (2009) not only found that there was no marginal benefit to big institutional placements for juveniles, but also the likelihood of re-arrest and reoffending was no different and perhaps slightly higher for juveniles who were placed in institutions compared to those given probation. Most rigorously, Bayer et al. (2009) clearly demonstrated that an individual can make criminal capital while incarcerated. Using a sample of juvenile offenders from Florida, Bayer et al. (2009) found strong institutional peer effects in that increased exposure to peers with a history of a specific crime type increases the likelihood that the subject (who has already committed that crime type) will commit that specific crime type upon release. Bayer et al. (2009) viewed that institutional contexts can foster criminal embeddedness in social linkage with like-minded and like skilled offenders and increase learning of crime skills, thereby resulting in more prolific offending. Ouss (2011) tested how interactions among prison cell-mates changed recidivism post release among federal prisoners in France. Ouss hypothesized that if prisons are truly ‘‘schools of crime’’ and there is an exchange or transfer of knowledge, crimes that require more skill (i.e., drug dealing and theft) would be more affected by peers compared to less skill-intensive crimes (i.e., drinking and driving). Results proved that indeed theft and drug dealing have the largest peer effect, whereas there were no peer effects for driving under the influence and assault. So, individuals who had prior experience with theft or drug dealing and spent time with cellmates who also committed theft and/or drug dealing were more likely to commit those crimes upon release. Recently, Hutcherson (2012) used the National Longitudinal Survey of Youth to look at the role of incarceration on illegal earnings and traced that individuals who had prior incarceration made more annual illegal earnings compared to individuals who have never been incarcerated. Hutcherson observed that

incarceration provides chances for individuals to get criminal social capital and knowledge from skilled offenders, which translates to greater annual illegal earnings.

To sum up this discussion, the incarceration research and its demand and supply side effects ignores one important point. That is majority of the incarcerated individuals (and the types of crimes reported in the above studies) hails from segments of the society that are already marginalized (Ramakers et al., 2014). Call it discrimination by the criminal justice system or else (Lee, 2016), these individuals have - even without incarceration - very limited useful and human capital and their probabilities of finding employment are dim even without criminal histories (Western, 2006; Wakefield & Uggen, 2010; Raphael, 2011; Dumont et al., 2012). However, if such cautions are correctly placed, even then rehabilitation program can nullify both demand and supply side effects of incarceration.

3.4.3 Income variables and crime

The economics model of crime predicts that legal income opportunities exert a negative influence on crime participation while illegal income opportunities are directly related with crime. In fact, it is the difference in legal and illegal income that influences an individual's decision of whether or not to participate in criminal activities. Ehrlich original empirical formulation considers both the level of and dispersion in income to represent illegal returns. That is, the level of income (as measured by median family income in Ehrlich, 1973) represent the level of transferable assets (loot) and income inequality measures the relative variations in the transferable assets. While an increase in the level of transferable assets provides greater opportunities for theft, a greater dispersion in the transferable assets across population provides an incentive to the marginalized groups to steal. Thus, both an increase in national income and in income inequality is seen to be criminogenic.

The most problematic and confusing variable(s) in empirical studies based on economics model of crime is the income variable. As noted above, Ehrlich (1973) and many other recent studies use various measures of national income (such as median family income, income per capita etc.) to proxy the size of loot that is available to potential offenders. But the same measure can be used, and is indeed used by many, as a proxy for the opportunity cost of offending. In one use (i.e. if it is used as the size of transferable assets), income variables should lead to more crime. In the second use (i.e. as opportunity cost of offending), income variables should lead to less crime. Thus,

classifying empirical studies based on the income variable is a cumbersome job. The impact of inequality in both theory and empirics is however non-ambiguous. That is income inequality effects crime participation through increased expected benefits from crime and reduced stacks in conformity. Both the effects of income inequality lead to more crime.

Empirical studies at macro level that finds various measures of income inequality to be criminogenic include; Ehrlich (1973), Zhang (1997), Fajnzylber et al. (2002), Gould et al. (2002), Gillani, Rehman & Gill (2009), Jalil & Iqbal (2010), Khan et al., (2015), and more recently Islam (2016). Individual level studies on the impact of inequality on crime are not found during the literature search. But this is natural as income inequality is usually measured at the aggregate level. However, an indirect test is provided by Carneiro, Loureiro & Sachsida (2005) and Loureiro et al., (2009) by linking crime with economic hardships.

Macro level studies that use various measures of income as the size of transferable asset include; Ehrlich (1973), Machin & Meghir (2004), Buonanno & Montolio (2008). Ehrlich (1973) use median family income while Machin & Meghir (2004) and Buonanno & Montolio (2008) use GDP per capita to measure the size of transferable assets and all these studies reported positive influence of these measures on crime. As already mentioned, income measures of the above type can be subjected to two opposing interpretations and hence these results may not be reliable. Recently, Shoukry (2016) used a more direct measure of transferable assets. The study regressed total monthly counts of cargo thefts on prices of the stolen goods (which is a more direct measure of crime lucre) and found a positive and significant relation between the two. Similarly, Uggen & Thompson (2003) found that at the individual level illegal earning is positively correlated with crime.

Macro level empirical studies that proxy legal income through measures other than per capita/median income are scarce. One such study that use variations in wages of unskilled labor force as a measure of legal income reports that lower wages leads to more crime (Machin & Meghir, 2004). Similar findings are also reported by Kollias, Mylonidis & Paleologou (2013) and Han, Bandyopadhyay & Bhattacharya (2013). The individual level evidence on the impact of legal income on crime, however, is pervasive. For instance, Myers Jr. (1983), using a sample of 2127 individuals released from US Federal prisons, finds that higher wages reduce recidivism. Trumbull (1989) has used data on about 2000 offenders released from prisons in North Carolina to study

recidivism. Higher earnings on the first job after release have a negative effect on crime. Verbruggen et al., (2015) traced the effects of employment and income support program on recidivism amongst a group of previously institutionalized youths in Netherlands and found that receipt of income support was inversely correlated with overall offending and with property offending.

However, as with many other variables of the model, findings on the income inequality and crime are not universal. There are macro level empirical studies which report either null or negative impact of inequality on crime (e.g. see Chintrakarn & Herzer, 2012; Hauner, Kutan & Spivey, 2012; Han, Bandyopadhyay & Bhattacharya, 2013). For example, Kelly (2000) used macro level data to examine the link between crime and inequality and observed very different patterns. That is while violent crimes are reported to be positively related with income inequality, property crimes are largely unaffected by inequality. Saridakis (2004), using national-level data for the United States, found a short-term–but no long-run–relationship between income inequality and crime. Neumayer (2005) concludes that inequality is not a statistically significant determinant of crime. Brush (2007) finds a positive effect of inequality on crime rates in a cross-section analysis but get an opposite result when using time series. Choe (2008), using panel data from U.S. states, finds a positive impact of the Gini Index on burglary and robbery, but no impact on other property crimes. Similar results have also been reported by Scorzafave & Soares (2009). Finally, Weatherburn, Halstead & Ramsey (2016) associated crime drop in Australia since 2000 to four factors, in which one of the factor is increasing per capita income. Carneiro, Loureiro & Sachsida (2005) and Loureiro et al., (2009) provides the individual level evidence that economic hardships are negatively associated with violent crimes.

The divergent results reported for income inequality in empirical studies may be due to the variety of proxies used (the same is true for the proxies of legal income) (Chisholm & Choe, 2005). For instance, Ehrlich (1973) used the "percentage of families below one-half of median income" as a measure of inequality while Fajnzylber et al. (2002) and Choe (2008) use Gini index to measure inequality. Besides, it may not be the general income inequality as measured by Gini index or any other such linear measures that is associated with crime. It may be that a specific part of the income distribution explains the inequality-crime relationship, or may be inequality amongst distinct population segments. To answer the first type of question Bourguignon, Nunez & Sanchez (2003) analyzed the specific part of income inequality that is criminogenic and reported that the per capita

income below 80 percent of the mean is associated with crime in Colombia. The importance of the second type of inequality i.e. racial income inequality, is highlighted by Blau & Blau (1982). That is, Blau & Blau (1982) hypothesized that in the U.S context, blacks had higher crime rates as compared to whites because they suffer from interracial income inequality. This hypothesis is studied by Stolzenberg, Eitle & D'Alessio (2006) and interracial income inequality indeed has a stronger impact than general inequality.

As has been discussed earlier, the major criticism on the income variable in the economics model of crime relates to the possible two different interpretations of these variables. Higher legal incomes (mostly wages) tend to make work more attractive than crime but to the extent that higher legal income in a region makes a greater number of more profitable targets for crime, the same empirical income measure may be positively correlated with criminal activity. In addition, high legal incomes also mean high incomes foregone when incarcerated, a cost of crime that will have a negative effect on crime. The problem is that the incomes of legal and illegal activities are highly correlated and that it is difficult (or impossible) to find empirical measures that with proper accuracy can differentiate between their effects (Eide, Rubin & Shepherd, 2006). An associated criticism is that why have researchers sought separate measures for legal and illegal income, while the difference between these two is all that is needed for empirical purpose? (Chisholm & Choe, 2005).

Pure time-series studies are also criticized on the grounds that these studies assume that national income and income inequality effects crime rather than the extent of inequality in the criminal's neighborhood (Brush, 2007). Moreover, if income inequality is indeed positively associated with crime rates, then why crime exists in countries where inequality is at low levels (Bernburg, Thorlindsson & Sigfusdottir, 2009; Savolainen et al., 2013)?

3.4.4 Education and crime nexus

In the economics model of crime, education indirectly effects individual's decision regarding participation in illegal activities through its effects on legal (illegal) income[15]. In effect, the economics models of crime suggest that the primary theoretical relation between increased education and reduced criminal behavior is that education increases legitimate job opportunities

[15] In Ehrlich (1973), the impact of education on crime participation is ambiguous.

and wages, thereby reducing the financial attraction of illegitimate criminal activities. However, criminologists have suggested several other effects of education that can reduce motivations to offend.

First, education may alter individual's preferences. The individual may value delayed gratification, may become less prepared to take risk as a result of education (Winter, 2008). In particular, according to Fajnzylber, Lederman & Loayza (2002), education incorporates a civic component in individuals and hence alter preferences for crime. Similarly, Usher (1997) argues that education has a "civilization" effect irrespective of its market effect. Second, the opportunity cost of being imprisoned is believed to be higher for individuals who have the potential to earn high legal wages. If education is directly related to earning ability, higher education is indirectly linked to increased severity of punishment, reducing the incentive for criminal behavior. Moreover, conviction in and of itself provides a social stigma that acts as an additional deterrent, and this bad symbol is to be more severe the more educated the individual. Lastly, independently of the level of schooling, school attendance alone reduces the time available for taking part in criminal activities (Witte & Tauchen, 1994).

In majority of the macro level studies, the hypothesis that education and crime are inversely related is substantiated. Examples of these studies include; Buonanno & Montolio (2008); Jalil & Iqbal (2010); Jabbar & Mohsin (2014); Jonck et al., (2015); and Khan et al., (2015). However, neither of these studies shed light on which of the above discussed channels in the education-crime nexus are in operation. Three studies based on macro level data tried to explain the channel through which education effects crime (Lochner & Moretti 2004; Machin et al. 2011; and Hjalmarsson et al. 2015). These studies utilized variation in compulsory attendance laws and showed that education is associated with less crime.

At the individual level, education-crime nexus has been studied extensively. For instance, at the early age, many studies have reported that dropping out from school is positively associated with delinquency (e.g. see Thornberry, Moore & Christenson, 1985; Farrington, 1989). Better teacher-student ratios and vocational training (Arum & LaFree, 2008), years of education (Suhail & Javed, 2004; Arum & Lafree, 2008; Merlo & Wolpin, 2015) and college attendance (Schroeder & Ford, 2012) are all reported to be inversely related with adult offending and incarceration.

The U-C relationship in itself implies that the given relationship depends on education, education leads to less participation in criminal activity (Grubb, 2002). Past research has normally found a negative relationship between employment and criminal activity (Siennick & Osgood, 2008; Jacob, 2011; Van Der Geest et al., 2011). Agnew et al. (2008), however, suggests that intergenerational educational pathways are more important in explaining education-crime nexus than an individual's education level. Upward education mobility promotes employment opportunities and hence inhibits individual from criminal activity. Downward mobility however creates economic stress and hence is criminogenic. This projection of Agnew is somehow based on the habit persistence in individuals. That is, individuals find downward mobility hard as they are used to a specific life standard. To maintain that standard, individuals are likely to engage in criminal activities. Although relatively new, Agnew thesis are tested by Swisher & Dennison (2016) and are proved correct.

Recently, Swisher & Dennison (2016) noted that previous research has generally supported the education-crime nexus. This is true, and this explains why sociologists, psychologists, criminologists and economists, in their respective theories of crime causation, all agree on the importance of education to control crime. However, there are certain exceptions to the general results usually found in the empirical literature with respect to education crime nexus. For instance, Carneiro, Loureiro & Sachsida (2005) reported ambiguous effects of education on crime. Loureiro et al., (2009) investigates the motivations of criminals for committing violent and non-violent crimes. Using a sample of prisoners, the authors reported that education is positively related with violent crime. However, these results are moderated by parent's education which exerted negative influence on committing violent crimes. Similarly, Savolainen et al., (2013) found little evidence that educational mobility was associated with decreased crime, contradicting Agnew et al., (2008).

Carneiro, Loureiro & Sachsida (2005) and Loureiro et al., (2009) results that education has either null or positive effects on crime participation are difficult to explain. One explanation, but which only applies to macro level studies, is forwarded by Winter (2008). Winter observes that [in macro level studies], it is very difficult to isolate the effects of education from deterrence variables. Winter (2008) observes that governments usually shuffle resources across sectors. For example, if government devotes more resources to policing and building prison facilities at the cost of education sector, this would result in less education for some individuals. The result may be seen

as less education is leading to a reduction in crime, while in fact it is the increased deterrence that mediates the education-crime nexus.

Another possible explanation for the positive education-crime relationship in Loureiro et al., (2009) is explicit in the sample used by the authors. The study is based on a sample of prisoners who usually belong to the marginalized segments of the society (Ramakers et al., 2014) with very limited useful human capital (Western, 2006; Wakefield & Uggen, 2010; Raphael, 2011; Dumont et al., 2012). Given this, it is natural to expect majority of the inmates either illiterate or with very little education. Hence, if we compare the intentions of illiterate with those marginally literate, it is of no surprise that we either found null or positive impact of education on crime intensions.

Empirical studies on education-crime nexus are criticized for not accounting for the possible reverse causation in the relationship (Winter, 2008). The usual predicted causation is that an individual with limited education is likely to do more crimes in comparison to an individual who is well educated. This prediction however ignores the possibility that individuals with higher propensity to commit crime are not likely to stay in school compared to those who are not prone to commit crime. Empirical studies do not delve to identify whether it is less education that is accounting for criminal behavior or is it criminal behavior that is accounting for less education.

A second criticism on the negative education-crime nexus is that such a relationship, at best, can hold in street and violent crimes. This relationship ignores that certain crime, i.e. white-collar crimes, require a minimum level of education. There may also be crime types which require a minimum level of skills. If such is the case, then one may expect that more education leading to more crime.

3.5 Empirical literature from Pakistan

Empirical research on causes of crime in Pakistan is either based on published data (by economists) or is necessarily descriptive/anecdotal (sociological research). Starting with the sociological research (which is based on primary and individual level data), Rafail & Haque (1999) assessed the styles of parenting as perceived by the children and to relate them to criminality. The study obtains data from 100 individuals, in which 50 adolescents (mean age of 18 years) were declared criminals while the rest were non-criminals. The data collection tool was modeled on the "maternal and paternal rejection-acceptance questionnaire" and "juvenile delinquency inventory". By using correlations between juvenile delinquency scores and parental rejection scores, the main findings

of the research are that criminal's adolescents are the results of parental rejection. The authors also found significant differences between the scores for delinquent and non-delinquent adolescents.

Chotani, Razzak & Luby (2002) investigated patterns of violence in Karachi-Pakistan. The study was based on a case series of persons suffering from intentional injuries and transported by Edhi between October 1993 and January 1996. During the study period, Edhi Ambulance Service transported 4091 intentionally injured persons. Firearms were the agent of injury of 3392 victims (85 percent). Intentional injuries were concentrated in certain areas of the city with 1828 (46 percent) injured in only four of the 41 neighborhoods. The area with the largest number of violent injuries was Korangi (n=884, 22 percent) followed by Orangi (8 percent, n=337), Malir Colony (8 percent, n=307), and Nazimabad (8 percent, n=300). One common characteristic among these four areas is that they were all strongholds of Karachi's major opposition party. During the study period, there were a total of 36 days of political strikes (strikes called by the opposition party) and violent injuries increased significantly during those days.

Suhail & Javed (2004) studied a sample of 100 convicts waiting on the death row in Kot Lakhpat Jail, Lahore. Data was collected through a semi structure questionnaire. During interviews, a police officer and a lady matron accompanied the interviewer in order to insure the safety of the interviewer [which might have limited the reliability of responses]. The mean monthly income of the sample was Rs. 14600. Majority (49 percent) of the convicts were unskilled laborer, 78 percent were having no previous criminal history, 56 percent were married. Guns were used (72 percent) in majority of the cases as preferred instrument for murder. As per the self-reported causes of murder, the greatest number of murders were committed due to petty affairs (22 percent), followed by old enmity (20 percent), property disputes (17 percent) and honor killing (11 percent). 85 percent of the respondents claimed that the murder was not planned but accidental. Of the victims, 69 percent were close relatives, neighbors or friends while the rest were strangers.

Mahmood & Cheema (2004a) conducted a study at Faisalabad and Bhawalpur Districts in Punjab Province, where two Borstal Institutions and Juvenile Jails are located for juvenile's rehabilitation. In all, 221 juvenile convicts in both jails were taken for data collection through a structured and pretested questionnaire. Correlations are used to derive conclusions regarding relationships. Majority of the respondents committed crimes in retaliations to some social or individual injustice. Poverty or lack of resources forced 10 percent of the respondents to commit crime. The other

causes that triggered those individual to commit crimes includes; personal aspiration (3.2 percent), pressure of associates (10.9 percent), fulfilling the dream of becoming rich over right (2.3 percent), land disputes (19 percent), provocation (4.1 percent), accidental (12.2 percent), self-defense (3.2 percent), drug addiction (1.4 percent) and sexual lust (10 percent). The correlation coefficients revealed that parents conflict, community environment, negative attitude of father, and violent media exposure are positively correlated with juvenile delinquency. However, monthly income was found to have no association with juvenile delinquency. Another study by Mahmood & Cheema (2004b) use the same sample (i.e. the one used in 2004a and mentioned above). 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 as the main determinants of the juvenile heinous crimes.

Tahir et al., (2011) explored crime trends among youth in one of the districts of Pakistan (Gujrat) with the collaboration of District Police Department. The purpose of the study was to find out crime trends among youth (15-29) with respect to age, caste, gender, religion, residential area and professions in the district. The authors obtained criminal record of offenders (last 12 months) from Crime Scene Cell, Gujrat to analyze crime trends among youth on selected variables. About 14500 criminals were sent to prison during January 2010 to February 2011 in district Gujrat. Criminal biography of 3 percent offenders was separated (435) from the record and reviewed randomly. Analysis of selected crime cases determines that 59.2 percent criminals belonged to the age group of 15-29 years and crime incidents were significantly higher among young people (from 25-29). Most common crimes committed by youth (15-29) were theft, murder, abortion, robbery, offences relating to intoxicants, offences related to weapons and firing with criminal intent. Crime trends among youth (15-29) were higher in rural areas. Most young criminals (15-29) belonged to "Jutt" caste and "laborer/worker professions (blue collar)".

Zafar et al., (2013) studied the socio-cultural factors responsible for crimes committed by females. The data was collected from Adiala Jail situated in Rawalpindi district by interviewing a sample of 100 female respondents. The study uses interview schedule for data collection and reports descriptive statistics on a number of important characteristics of the offenders. For example, it is reported that majority of the respondents were between 15-25 years of age (45 percent), 30 percent were illiterate, 51 percent were from rural background, 50 percent were having monthly income

of less than Rs. 1000, 55 percent of the respondents reported no shame/guilty feelings on their illegitimate acts.

Batool & Ishaq (2014) study explores the impact of TV crime shows on rob criminals (who rob something using violence) of District Camp Jail, Lahore and critically analyzes Travis Hirschi's social bond theory in this respect. It attempts to investigate attachment and involvement levels of rob criminals with various social agents and reveals the responsible factor of violent behavior among rob criminals. Survey method (n = 200) was used as tool of investigation. It was found (through correlations and factor analysis) that rob criminals have high level of attachment and involvement with parents, low attachment and high involvement with delinquent peers. Moreover, criminals have low level of attachment and involvement in religion. Exposure to TV crime shows and peers were found main factors of robbery.

Salahuddin (2014) scrutinized the intent behind street crimes. To have an insight, street crimes were decomposed into mobile snatching and street assault. To ascertain the intent of crime along with the motivational and de-motivational factors, different set of variables were analyzed with both dependent variables. Ordered probit model was used to analyze the outcomes [the study is based on sample data but nothing explicitly is stated about the sampling]. Model estimates asserts that intent of mobile snatching has been significantly enhanced owing to perceived judicial inefficiency and lower ability of police reforms to operate effectively, which signifies the inefficiency of institutions that are entitled to deliver justice and maintaining law and order respectively. Whereas, intent of street assaults as an outcome, affirms that people with lack of self-stability and severe childhood punishments were more tempted to be involved in violent acts.

Alam et al., (2014) conducted a study to explore the public perception about the cause and effects of crime and insurgency in FATA. A sample size of 380 respondents including intellectuals, business communities, Internally Displaced People (IDPs), students and persons from local political administration was randomly selected. Poor governance was held responsible by 83 percent of the respondents as the prime catalyst of lawlessness in the region followed by ineffective judicial system (79 percent), unemployment in youth (78 percent), poor socio-economic conditions (75 percent), and abundance of firearms (63 percent).

Time series-based studies on covariates of crime has recently emerged to supplement the descriptive research in Pakistan. The first such study was conducted by Gillani, Rehman and Gill

(2009). These authors examined the impact of inflation, poverty and unemployment on reported crimes in Pakistan. Using time series data for the period (1975-2007) and Granger and Johansen co-integration (JJ) methods for analysis, the study reports a long run cointegration relationship among crime, unemployment, poverty and inflation. The causality results show that crime is Granger caused by unemployment, poverty and inflation in Pakistan. Another similar study by Gillani, Khan & Gill (2015) inspected the link between unemployment and property crimes. Their time series data set ranged from 1975 to 2010 obtained from various published sources. The reported property crimes considered are cattle theft, dacoity, theft, robbery and burglary. Johansen and Granger causality are used for empirical testing. Their results show that unemployment and property crimes are positively related in the long run. The Granger causality results show that unemployment cause the property crimes in Pakistan.

Jalil & Iqbal (2010) investigated the relationship between crimes and urbanization and some other macroeconomic factors such as unemployment, and inflation (using time series data from 1963-2008). Using Johansen cointegration analysis, the results indicate that there is a positive association between urbanization and crime in Pakistan. Moreover unemployment, inflation, and income inequality are also important determinants of crimes. Education, on the other hand, is found to have a negative effect on criminal activities.

Khan et al., (2015) examined the socio-economic determinants of crime in Pakistan. The authors use reported crime as a proxy for criminal behavior and include unemployment rate, headcount ratio as proxy for poverty, GDP per capita and higher education enrolment rate in their regression specification. The data covers a period of time from 1972 to 2011 and the analytical methodology they use is Johansen co-integration and Vector Error Correction Modeling (VECM). The study finds that there is a positive relationship between crime rate and unemployment in both short and long-runs. The other outcome is that there is strong significant and negative relation between the crimes rate and the higher education in short as well as in long-run. The pivotal outcome of the study evaluates that GDP per capita leads to higher crimes rate in long-run but decreases it in short-run. The last but not the least conclusion induce a positive relation between the crimes rate and poverty in the long-run but have negative relationship between both the variables in the short-run.

The above-mentioned time series studies suffer from several serious limitations. Besides using reported data, these studies also ignore the criminal justice system variables (i.e. probability and

severity of sanctions) and hence the estimated equations may be mis-specified. The best empirical study on the economics of crimes in Pakistan, to-date, is the one carried out by Jabbar & Mohsin (2014). Since the study is the most comprehensive of its type in Pakistan (according to author's own claim), hence it deserves a deeper scrutiny. The empirical specification of the study is as follows;

Crime = f (police strength, conviction, population, unemployment, education)

The study estimates the above specification using time series data from 1978-2012 (Punjab only). Using JJ, the study reports negative association between police strength and murder and between conviction rate and murder. Population density is positively related while both education and unemployment are negatively related with murder rate.

The first independent variable included in empirical model is labeled as "police strength" which has been defined as the number of police employees available to thousand citizens of Punjab in each year. It has been noted previously that "police strength" is the most criticized variable due to bidirectional causality and needs no mention again. The second variable "conviction" has been defined as the ratio of the number of offenders convicted to the total number of offenders recorded in case of murder in Punjab. Population density is defined as total population of Punjab in per square miles and data is obtained from Punjab Development Statistics. Unemployment rate has been defined as the number of persons who are unemployed out of the total labor force in Punjab. Literacy rate has been defined as, "a person who can read and write his/her name" and data is taken from various issues of labor force survey.

The study considers only one type of crime (murder) to avoid the criticism of lumping together distinctly different crime (as is the case with overall reported crime rates). But their discussion that different crimes are motivated by different sets of factors unnecessarily reduces the scope of the economics model of crime. No economics model of crime to-date says anything regarding differing motivations for different crimes. Moreover, if the authors are correct in this (as many criminologists from sociology background would suggest), then murder would be the last crime sensitive to economists' tool kit. Numerous studies have reported that murder is the least sensitive of the crimes to economic variables (e.g. see Ehrlich, 1973). However, the authors are correct in that murder is less subject to under-reporting or over-reporting as compared to pity crimes or honor crimes (but there is evidence that even cases of murder are under reported in Pakistan; e.g. see

Chotani, Razzak & Ruby, 2002). Moreover, the study also misses out to include some important explanatory variables such as income and may have mis-specification issues. Similarly, the study also fails to shed light on which of the two effects on unemployment are dominant in their study. That is, no effort in the empirical specification is made to isolate the motivational effect from the opportunity effect.

3.6 Conclusion

Before closing this chapter, it is imperative to mention two recent theories that extended the rational actor model. The first one is the "rational choice theory" by Cornish & Clarke (1986, 1987, 1989, 2008, 2014), and Clarke & Felson (1993). These authors refined and popularized the Becker's (1968) perspective. The major difference between Becker (1968) and this lateral rational choice perspective centers around the type of rationality assumed. While Becker (1968) assume individuals to be rational in the conventional economic sense, this lateral perspective assume rationality to be conditional on several factors, including ability, time and information available to the individual.

A second extension in the usual rational actor model is proposed by Wikstrom's (2004, 2006 and 2010). This extended perspective which is named as the "situational action theory", postulates that individual's cost benefit analysis comes in operation once an action is allowed by the moral filter of the individual. That is, perceptual deterrence is irrelevant if an individual has strong moral values. In effect, both of these new perspectives are the same. That is, while in the rational choice theory, an individual rational calculation is affected by his/her cognitive and other factors, the same rationality is affected by the moral filter of an individual in the situational action theory. Situational action theory is recent but is by far the most tested theory in recent times. Empirical results, however, are mixed. Studies that support the SAT include; Pryor et al., (2008), Kroneberg et al.2010, Svensson (2015), Silver & Abell (2016), Piquero et al. (2016), and Schepers (2017). Empirical studies that found no support for the SAT include; Pauwels et al. (2011), Gallupe & Baron (2014), and Cochran (2015, 2016).

Chapter 04

Modeling Framework

4.1 Introduction

As is noted in the previous chapter, there is a wealth of competing theoretical explanations of crime and criminality, but none provides a satisfactory explanation for all types of crimes. Bernard et al. (2015) and other researchers have long recognized the problems created by multiple explanations of crime and suggested three ways to reduce the number of explanations. These are; falsification of some theories, integrating various theories, and focusing on variables rather than theories. The last option would however, make empirical research atheoretic and as suggested by Witte (1980), theories guide empirical research. Recent developments in theoretical research in criminology has predominantly focused on integration of various theories (e.g. see Tittle's control balance theory or general strain theory by Agnew), with very little focus on falsification. This chapter is an effort to construct a model of crime that explain much of the crime in society. In doing so, no intentional effort has been made to integrate or falsify any theory. The model nevertheless closely resembles (besides the rational actor model of economics) rational choice theory of Cornish & Clarke (1986) and situation action theory of Wikstrom (2004). Significant differences however, exists which are discussed at the end of this chapter.

4.2 The Augmented Rational Actor Model (ARAM)

Following Becker (1968) and Ehrlich (1973), economists have generally modeled crime as a long-term occupational choice and have entirely ignored, except Cervellati & Vanin (2013), the problems arising from low self-control. Contrary to this view are two important insights provided by social theorists like Matza & Sykes (1964) and Gottfredson & Hirschi (1990). Matza & Sykes (1964) argue that, "*even the most committed criminals and delinquents are not involved in criminality all the time; they also attend schools, family functions, and religious services. Their behavior can be conceived as falling along a continuum between total freedom and total restraint. This process, which is called drift, refers to the movement from one extreme of behavior to another, resulting in behavior that is sometimes unconventional, free, or deviant and at other times constrained and sober*" (cited in Seigel 2016, p. 221). Similarly, Gottfredson & Hirschi (1990) argue that majority of the crimes results from satisfying desires of the moment. They further state

that people low on self-control are more likely to succumb to desires of the moment than those high on self-control. These simple observations imply, as opposed to the economics models of crime, that crime is not an occupational choice and that variations in self-control would be a more reasonable approximation of individuals than assuming an average economic man[16].

Self-control problem can be modeled, as suggested by Cervellati & Vanin (2013), as a temporary increase in the subjective discount rate at the moment of actual choices made (i.e. weighing benefits of actions more heavily than costs). Thus, recognizing the self-control problem and the resulting heterogeneity in population, and as a departure from the standard utility jargon, the theory that follows in this chapter model "temptations" to commit crime. However, it needs to be mentioned that there is no real difference in the standard literature of crime economics and the one used in this chapter except explicitly recognizing the self-control problem.

The augmented rational actor model that follows is very much inspired by Antoci et al., (2017, p. 350) who stated that, *"As society becomes increasingly complex, the analysis of crime-related issues should transcend the traditional fields of research and become something of general importance to the social sciences, with a new common paradigm".* The proposed model agrees with that, "people have reasons for what they do" (Simon, 1986; Lindegaard & Jacques, 2014; Pogarsky, Roche & Pickett, 2017) but also recognizes that "heterogeneities" (Diewald & Faist, 2011; Schepers, 2017) are at the core of differential temptations for "how they do". That is, the model assume that individuals are rational decision makers but not, strictly, in the economics sense. It is assumed that individuals are rational, but this very power of rationality is conditional on the available time for response, individual's cognitive abilities and on the information available (Simon, 1955; Cornish & Clarke, 1986; Nagin et al., 2015). In the formal mathematical analysis of individuals temptation for various action alternatives, this constrained form of rationality would imply that actual effects of various variables on individual's temptation could vary, depending on the individual's personal and environmental characteristics, by the epsilon (ϵ) quantity (Dixon, 2001), where ϵ is an assumed small non-negative number. Or that actual decisions made are not based on full information and perpetrators [wrongly] overestimate/underestimate immediate benefits/distant costs.

[16] Clarke & Felson (1993) also observe that individuals facing similar circumstances usually act/behave differently and hence assuming population homogeneity may not be correct.

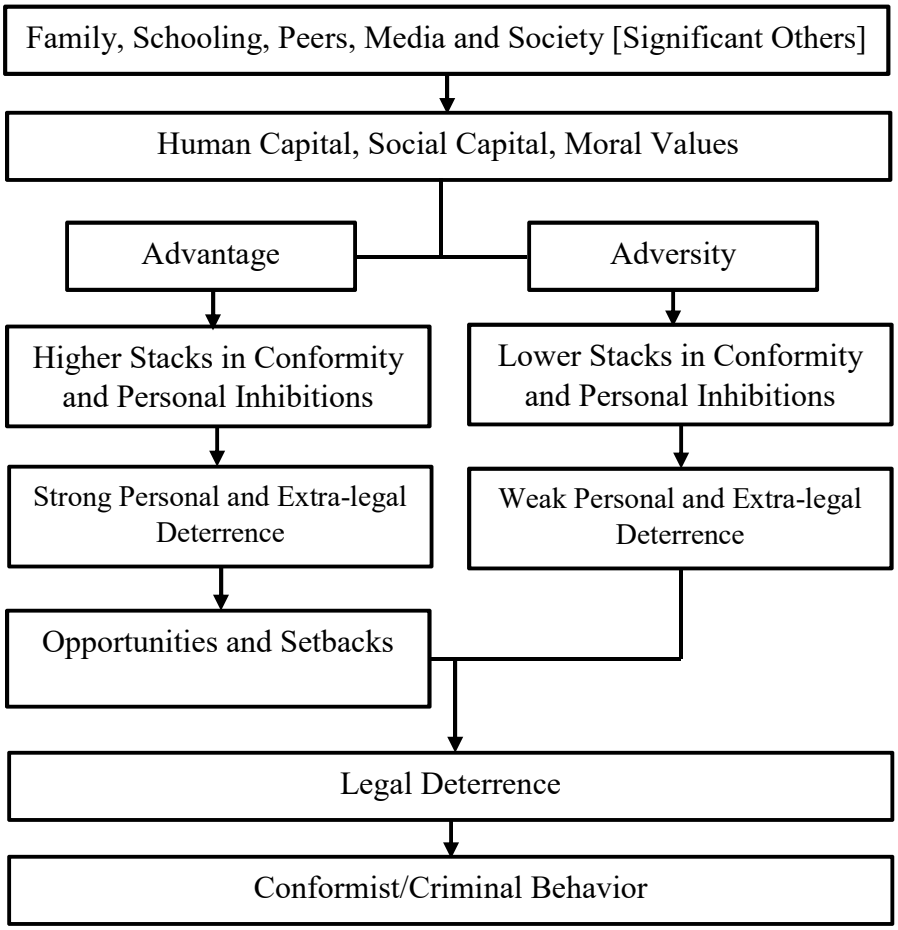
In brief, the model states that every individual in society has set for himself some valued goals and strive for its acquisition either through legal or illegal means. Moreover, some members of the society are characterized by low human and social capital and low morality. Such individuals are predisposed to acquiring their valued goals through illegal means. Other members of the society, with useful human and social capital and high morality, and who are otherwise immune to illegal means are exposed to these by opportunities and setbacks. Given the disposition of both groups, their decisions to act on temptations are conditioned by the probability of detection and severity of punishment that are associated with adopting illegal means. If the value of illegal temptation is greater than those of legal drives, individuals are *likely* to acquire their valued goals through illegal means and vice versa. Note the use of the word, "likely" in the previous sentence. This model does not necessarily predict that individuals low on human and social capital and morality, in the absence of legal and social control, choose criminal means to acquire their valued goals. What the model says is that such characteristics increases the likelihood of criminal involvement. The theoretical underpinnings of ARAM are displayed in figure 4.1 below.

The theoretical model (i.e. ARAM) states that, in line with many sociological theories, social structures and institutions such as family, schools, peers, media and the society at large are important determinants of individual differences. Specifically, differences in social structures and institutions cause discernable differences in social capital, human capital and moral values of individuals. Individuals with useful social capital, human capital, and moral values of the middle class are at advantage in having marketable capabilities. Such individuals are characterized by higher stacks in conformity and moral values that inhibit them from participation in the illegal activities. In other words, the personal and social costs associated with offending are higher for the advantageous group. The model predicts that this "advantageous group" is immune to criminality in the absence of opportunities and setbacks.

The second type of individuals, those who are at adversity with respect to human capital, social capital and moral values, have lower stacks in conformity and personal inhibitions from crime. Having lower personal and social costs of offending, this group is more likely to offend than the "advantageous group". Given these initial differences in temptations to commit crime, individual's action alternatives are further conditioned by the perceived legal sanctions that are associated with offending. In line with deterrence literature, the model predicts the cost of legal sanctions to be the

greatest for individuals having useful human and social capital. Since the final decision of whether or not to act on criminal temptations depends on the net payoff of offending, the group at adversity is more likely to offend than those who are at an advantage.

Figure 4.1 Schematic Representation of ARAM



4.3 Mathematical formulation of ARAM

Let j be a rational individual and Y be a "valued goal" of individual j[17]. The "valued goal" could be income, good academic grades, promotion, satisfaction of sexual desires, seeking justice or any other desirable object. The valued goal is perfectly legal, in the sense that, neither the law nor the society condemns aspiring the goal. The goal, however, can be accomplished by two different, but

[17] As opposed to Becker (1968) and Ehrlich (1973), Cornish & Clark (1986c), Cornish (1993) and Nagin et al. (2015) assume individuals' rationality to be of bounded type, a type of rationality that is constrained by factors such as individual's cognitive abilities, the time available for responding to situations and on the available information.

not necessarily mutually exclusive, means; Y^l and Y^i. Y^l is attaining Y through legal means while illegal means of attaining Y is denoted by Y^i. The decision of the jth individual to accomplish Y through legal (Y^l) or illegal (Y^i) means is conditional on the individual's temptations which, in turn, are constrained by the following factors.

4.3.1 Human capital

There are probably few things that are as important in economics as human capital. Reference to the term could even be found in Adam Smith's classic book, "*An Inquiry into the Nature and Causes of the Wealth of Nations*"[18], but the term was popularized by Schultz (1961) who defines human capital as the acquisition of all useful skills and knowledge that is part of deliberate investment. More recently, Acemoglu & Autor (2011, p. 3) defines human capital as, *"any stock of knowledge or characteristics the worker has (either innate or acquired) that contributes to his or her productivity".* Thus, individual's skills and health that results from investment in education and training are termed as human capital in economics. Extant body of theoretical and empirical research in economics links improvements in human capital to economic growth and development (e.g. Romer, 1990a, Barro, 1992 and Barro & Lee, 1994). According to this strand of research, investment in useful human capital determines individual's (Smith, 1776) as well as society's fortunes. From this perspective, individuals and nations having meager stock of useful human capital are expected to be less fortunate and under developed. What is less clear from this research however, is the impact of human capital on individual's decisions to acquire their desired objects through legal or illegal means.

The counterpart of human capital in criminology is usually termed as self-efficacy and its impact on individual's criminality have been studied extensively (e.g. see Nieuwbeerta et al. 2009; Loughran et al. 2009; Bayer et al. 2009; Ouss, 2011; Bales & Piquero, 2012; Hutcherson, 2012). As with human capital, self-efficacy also depends on social institutions such as parenting, schooling and association with peers. Criminologists usually drift as far as to define criminal self-efficacy (e.g. see Laferriere & Morselli, 2015), a type of human capital where skills conducive to criminality are acquired through the same agencies that transmits useful human capital. Thus, in

[18] While referring to the stock (capital), Smith writes, "the acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, costs a real expense, which is capital fixed and realized, as it were, in his person. Those talents, as they make part of his fortune, so do they likewise of that of the society" (Campbell, Skinner & Todd, 1976, P. 282).

many sociological studies, social institutions like family, schools and peers are at the central stage in explaining criminal tendencies in individuals. More specifically, theoretical and empirical studies on self-efficacy imply that, in line with economic reasoning, self-efficacy is negatively correlated with criminal tendencies.

Economic reasoning also suggests that individuals with human capital in demand would find it easier to work in the legal sector – a fact that should make offending a less attractive action alternative. Moreover, individuals' high in human capital would have to lose much more – in the form of school or work - in case their involvement in illegal activities is detected (Agnew, 2010). That is, such individuals have higher stacks in conformity as compared to individual with no (or low) human capital. We can thus classify individuals in two broad categories (which do not rule out the possession of negative human capital); those having marketable human capital and those without marketable human capital. Based on this classification and the voluminous empirical literature from criminology, we hypothesis that personal human capital works as a personal deterrence from offending. Hence the following relationship must hold between Y^i and useful human capital (C_j);

$$\frac{\partial Y_j^i(.)}{\partial C_j} < 0 \qquad (4.1)$$

That is an increase in useful human capital enables individuals to acquire their valued goals through legal means and vice versa.

4.3.2 Social capital

Economists have generally devoted very little attention to social capital's impact on criminal participation (Buonanno, Pasini & Vanin, 2012). Coleman (1988, p. 98) defines social capital as, *"a variety of entities with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors within the structure"*. Empirical studies find that social capital is a collection of three main dimensions; generalized trust, civic norms, and associational networks (e.g. Knack & Keefer, 1997; Bjørnskov, 2006; and Buonanno, Montolio & Vanin, 2009). Similarly, Putnam (2000) argues that generally social capital refers to trust and social participation, whereas he further subdivides social participation into political participation, civic participation, religious participation, altruism, and volunteering. In a nutshell, social capital

is anything that facilitates individual or collective action, generated by networks of relationships, reciprocity, trust, and social norms.

The empirical relationship between crime and social capital is not clear; it could be positive or negative (Buonanno, Montolio & Vanin, 2009). According to Foley & Edwards (1997), social capital is a neutral resource and its good or bad use (i.e. relationship with criminal participation) is determined by the society. In this sense, there could be useful as well as negative social capital (Perkins, Hughey & Speer, 2002; Lester, Maheshwari & McLain, 2013). While useful social capital encourage and facilitate individuals to acquire their valued goals through legitimate means, negative social capital facilitates the reverse of it. For instance, having useful social capital may increase returns to noncriminal activities by raising detection probabilities (Buonanno, Montolio & Vanin, 2009). That is, the denser the social capital of an individual, the more heavily the individual is likely to discount the expected social sanctions that may be imposed if he/she commit a crime (Buonanno, Pasini & Vanin, 2012).

The negative social capital facilitates participating in illegitimate activities either directly or indirectly. It may encourage acquiring valued goals through illegal means by providing direct support to individuals at times of need. For instance, having negative social capital may provide official cover to criminal activities (e.g. see Buonanno, Montolio & Vanin, 2009), may be a source of sharing criminal know-how (e.g. see Calvó-Armengol & Zenou 2004), or may facilitate imitating peer's behavior (e.g. see Glaeser et al. 1996; Haynie 2001; Silverman 2004; Patacchini & Zenou 2005). The indirect impact of negative social capital on crime participation involves appreciating, actively or passively, delinquent role models.

The positive social capital works in the form of social controls to inhibit criminal engagement (Agnew 2005). Many individuals do not engage in crime because they are high in direct controls—that is they are surrounded by others who set clear rules that prohibit misbehavior, closely monitor behavior, and consistently sanction violations of rules in an appropriate manner. These others may be parents, teachers, neighbors, peers, and employers. Individuals also refrain from crime because they have strong emotional bonds to conventional others, such as parents, spouses, and teachers. Thus, social capital affects offending in two ways. First, by increasing civic engagement, social capital may increase the probability of being reported to police. For instance, Bursik & Grasmick (1993) argue that the effectiveness of law enforcement and public control is higher in communities

with extensive civic engagement. Sampson & Groves (1989), Land et al. (1990), Rosenfeld et al. (2001), and Akcomak & Weel (2012) provide further empirical evidence on this matter. Second, social capital may increase the severity of punishment. Having useful social capital implies good reputation in society which is synonymous to having greater stakes in conformity. Thus, participation in criminal activities is identical to risking stakes in conformity; i.e. loosing beneficial social capital (Williams & Sickles, 2002). It is, therefore hypothesized that the positive counterpart of the social capital (S_j) works as a social deterrence to acquiring valued goals through illegitimate means. That is;

$$\frac{\partial Y_j^i(.)}{\partial S_j} < 0 \qquad (4.2)$$

4.3.3 Moral Values

Morality, called civic norms by Buonanno et al., (2009), refers to the system of principles that differentiate good and acceptable behavior from bad and unacceptable behavior. Two aspects of morality have been linked with criminality in previous research; the feelings of guilt and shame (Wikström, 2010; Svensson et al., 2017). Guilt is an immediate response of the inner self in case an individual commits an immoral act. Shame, on the other hand, is the immediate response of the society because of committing an immoral act. In effect, guilt is a personal control while shame is a form of social control. Since both guilt and shame are immediate responses to crime, for individuals having pure time preferences, these controls may be more important than any of the other forms of control[19].

Shame has been defined as one of the most essential, painful and intensive of all emotions (Elster, 1999; Lewis et al., 1992; Scheff, 1997). It has been pointed out that 'we often do everything we can to avoid the feeling of shame (Elster, 1999). Shame emerges when an individual commits an act that violates internalized norms and feels that he or she has failed to live up to the expectations of the society (Elster, 1999; Braithwaite, 1989). Guilt, on the other hand, emerges when an individual commits a specific act that violates prevailing norms and values and then judges the violation of the norm as a morally wrong act (Elster, 1999). This gives a feeling that the individual

[19] This generalization is facilitated by the fact that both probability of detection and severity of punishment are probabilities having values less than one. Moreover, sanctions may apply with lags while the feelings of guilt and shame are immediate.

has failed to live up to his/her own, internalized moral code. The feeling of guilt means that the individual has the capacity to differentiate between what is morally right and wrong (Barrett, 1998; Gecas, 2001). Guilt is considered as less painful and intensive than shame because the emotion of guilt is related to a specific act whereas shame relates to the individual's perception of the self through the eyes of others and of others' disapproval (Elster, 1999; Svensson et al., 2017).

Moral values can differ amongst individuals as well as with respect to different crimes in each individual[20]. Crime (as is operationalized in the questionnaire) refers to all those acts that are condemned by either law, society or the religion. Thus, we hypothesis that the feelings of shame and guilt would be the strongest if an act is condemned by all the three criteria and the weakest if an act is condemned only by one criteria. Overall, we expect moral values (M_j) to exert a negative influence on acquiring valued goals through illegitimate means and vice versa (e.g. see Buonanno et al., 2009 according to whom the feeling of shame and guilt increases the opportunity cost of acquiring valued goals through illegitimate means). That is;

$$\frac{\partial Y_j^i(.)}{\partial M_j} < 0 \qquad (4.3)$$

4.3.4 Other influences/Situational factors (ε_j)

Individual's capabilities, the type of social capital and his moral values will determine individual's temptations to acquire valued goals either through legitimate or illegitimate means. These temptations however are conditional on many other things such as opportunities and setbacks. Both opportunities and setbacks turn temptations in favor of illegitimate means. As an example of setbacks, an individual with marketable capabilities having useful social capital and good moral values is expected to achieve his valued goals through legitimate means but setbacks in the form of unemployment can shift his temptations in favor of illegitimate means. Such individuals are rightly termed as "victims of circumstances" (O'Mahony, 1986). On the other hand, individuals having personal and social attributes conducive to acquiring valued goals through legitimate means might have a tempting opportunity (employment for example) to acquire the valued goal through illegitimate means.

[20] A recent study by Svensson et al. (2017) finds that changes in within individual morality are associated with attachment to parents and school, parental monitoring, commitment to school and peers.

Thus, denoting all such opportunities and setbacks by $\boldsymbol{\varepsilon_j}$, it is hypothesized that;

$$\frac{\partial Y_j^i(.)}{\partial \varepsilon_j} > 0 \qquad (4.4)$$

4.3.5 Sanctions and sanctions perceptions

Starting from Becker (1968) and Ehrlich (1973), aggregate level literature on crime has considered objective risks associated with offending (e.g. arrest probabilities, clearance rate, police manpower) as effective deterrence to crime. This literature has accumulated considerable evidence of a negative relationship between objective risk perceptions and crime rate (for recent evidence, see Braga, 2001; Braga et al., 2001; DiTella & Schargrodsky, 2004; Weisburd, 2005; Klick & Tabarrok, 2005; Evans & Owens, 2007; Lin, 2009; Weisburd et al., 2010; and Draca, Machin & Witt, 2011). An associated type of literature has considered the sensitivity of crime to individual level risk perceptions. The primary contribution of this literature has been to show the usefulness of individual subjective perceptions, as opposed to objective clearance rates. Recent work with samples from the general population (Lochner, 2007), high-risk youth (Matsueda, Kreager & Huizinga, 2006), and serious offenders (Anwar & Loughran, 2011) has also shown that there is a negative correlation, albeit week, between subjective risk perceptions and crime.

Policy-oriented literature on crime stresses on variations in objective risks (i.e. probability of detection, arrest and severity of sanctions) to control crime. Variations in objective risk measures to have the desired negative impact on crime rates works through, amongst other channels, the channel of affecting individuals' subjective risk perceptions (Sloan et al., 2016). Indeed, deterrence and policies based on deterrence theory will work only if individuals' subjective risk perceptions are manipulatable through variations in objective risks (Nagin, 1998 and 2013; Apel, 2013). In other words, unless there is some correlation between objective and subjective risk, there is no basis for assuming that policies or practices that increase actual punishment levels will in any way influence perceptions (Pickett & Roche, 2016).

However, recent research (Kleck et al.2005; Lochner, 2007; Paternoster, 2010; Kleck & Barnes 2013; Pickett et al. 2015a, b) suggests that policies aimed at variations in objective risk may not be able to manipulate sanction perceptions, particularly perceptions of arrest risk. There is however substantive research that calls these studies deeply flawed and uninformative of deterrence theory

(e.g. see Apel, 2013; Apel & Nagin, 2011; Nagin, 2013a, 2013b). Moreover, and as intermediate stance, correlation between objective risks and subjective perceptions of risk is positive if policy makers effectively communicate legal risk information to the public (Pickett, Loughran & Bushway, 2016). The positive correspondence is substantiated by recent studies (e.g. see Anwar & Loughran, 2011; Pickett et al., 2016; Pogarsky et al., 2017) that states that individuals update their subjective risk perceptions through acquiring new information. Hence, previous literature suggests that objective and subjective risk perceptions usually differ but correlates positively through Bayesian updating.

In line with previous literature, it is argued that temptations are further conditioned by the perceived probability of detection and arrest (p_j) and severity of sanctions (f_j) that are associated with acquiring valued goals through illegitimate means. As in Becker (1968), Ehrlich (1973) and subsequent models of crime, the objective probability of detection and arrest (P_j) is determined by the efforts of the criminal justice system such as quantitative and qualitative improvements in police personals. Private protection measures such as installing CCTV cameras and, most importantly, the level of acceptance/rejection (by the society) of the illegitimate means used by individual j also determines probability of detection. In line with the foregoing discussion on objective and subjective probabilities, it is argued that subjective or perceived probability of detection and arrest (p_j) in turn is determined by (P_j) and information updating (I_j) [i.e. $p_j = p_j(P_j, I_j)$]. Perceived severity of the sanctions (f_j), on the other hand, include all costs associated with illegitimate activity (e.g. opportunity costs, and labor market consequences) and is determined by objective severity of sanctions (F_j), information updating (I_j), nature of the sanction and by the social standing of the jth individual [i.e. $f_j = f_j(F_j, I_j, W_j)$]. Thus, this formulation considers both legal and extra-legal aspects of p_j and f_j. Moreover, it is also being recognized that objective and perceived probabilities may differ [slightly] but the subsequent model assume a one-to-one relationship, i.e. $p_j \cong P_j and\ f_j \cong F_j$, between the two (unless the distinction becomes very necessary). For simplicity, and where modeling is not intended, some variables mentioned in discussion are not included as arguments in the following formulation. Denoting social standing

of the j[th] individual by W_j, it is assumed that perceived severity of sanction is an increasing function of W_j (Cook, 1977; Witte, 1980; Lott, 1992).[21] That is;

$$\frac{\partial f_j(F_j,W_j)}{\partial W_j} > 0 \qquad (4.5)$$

Thus, given the above discussion, individual's j temptation to acquire *Y* through legitimate means (Y^l) or illegitimate means (Y^i) is determined by;

$$ET_jY_j^i = p_jT_j\left[Y_j^i\left(C_j,S_j,M_j,\varepsilon_j\right) - f_j\left(F_j,W_j\right)\right] + \left(1-p_j\right)T_j\left[Y_j^i\left(C_j,S_j,M_j,\varepsilon_j\right)\right] \qquad (4.6)$$

This formulation takes care of the idea that certain individuals in the society are predisposed to criminality which is captured by the arguments in $Y^i(.)$. Thus, equation (4.6) implies that individuals compare the expected value of temptations (T_jY_j) to acquire Y through illegitimate means with that of legitimate means and act on their temptations if;

$$ET_jY_j^i > T_jY_j^l \qquad (4.7)$$

It follows from equation (4.6) and the restriction imposed on various partial derivatives in the forgoing discussion that;

$$\frac{\partial ET_jY_j^i}{\partial P_j} = T_j\left[Y_j^i\left(C_j,S_j,M_j,\varepsilon_j\right) - f_j\left(F_j,W_j\right)\right] - T_j\left[Y_j^i\left(C_j,S_j,M_j,\varepsilon_j\right)\right] < 0 \; if \; f_j\left(F_j,W_j\right) > 0 \qquad (4.8)$$

$$\frac{\partial ET_jY_j^i}{\partial F_j} = -p_j\frac{\partial T_i\left[Y_j^i\left(C_j,S_j,M_j,\varepsilon_j\right) - f_j\left(F_j,W_j\right)\right]}{\partial F_j}\frac{\partial f_j\left(F_j,W_j\right)}{\partial F_j} < 0 \; if \; \frac{\partial T_j(.)}{\partial F_j} \; and \; \frac{\partial f_j\left(F_j,W_j\right)}{\partial F_j} > 0 \qquad (4.9)$$

$\frac{\partial f_j\left(F_j,W_j\right)}{\partial F_j}$ in equation (4.9) can be interpreted as a marginal change in subjective severity of sanctions which results from a change in objective severity of sanctions. Although recent empirical research may suggest otherwise (e.g. see Kleck et al., 2005; Lochner, 2007; Kleck & Barnes, 2013, 2014), existing theoretical models assumes that subjective and objective probabilities are directly associated. If we stick with this assumption (which is not required), then severity of sanctions to have negative impact on temptations to acquire *Y* through Y^i requires $\frac{\partial T_j(.)}{\partial F_j}$ (i.e. marginal change

[21] According to Witte (1980), the cost of confronting criminal justice system as a result of offending is directly related to an individuals' wealth, wage rate and socioeconomic group. According to Lott (1992) findings, negative reputation effect increases with an increase in income. Similar observations are also made explicit by Cook (1977) to whom severity of punishment is directly related with living standards and good reputation.

in temptations resulting from variations in F) to be positive. Again, theoretical models and empirical results are at odds with respect to the sign of $\frac{\partial T_j(.)}{\partial F_j}$. Majority of the deterrence model assumes this to be negative (e.g. see Becker, 1968; Ehrlich, 1973 and all other such studies) but empirical research, particularly on effects of incarceration on recidivism, suggests otherwise. That is, imprisonment may deteriorate useful human and social capital (e.g. see Nieuwbeerta et al. 2009; Loughran et al. 2009; Bayer et al. 2009; Ouss, 2011; Bales & Piquero, 2012; Hutcherson, 2012; and Nguyen et al. 2017), moral values and may be seen as a setback by the offender. All such outcomes are expected to increase temptations for involvement in Y^i and hence $\frac{\partial T_j(.)}{\partial F_j}$ may be positive. Considering this discrepancy in empirical and theoretical research, equation (4.9) cannot be signed at priori and hence can assume both negative and positive sign.

Similarly, partially differentiating equation (4.6) with respect to C_j, S_j, M_j and ε_j yield the following first order conditions;

$$\frac{\partial ET_j Y_j^i}{\partial C_j} = \frac{\partial T_i\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial C_j} < 0 \; because \; \frac{\partial\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial C_j} < 0 \tag{4.10}$$

$$\frac{\partial ET_j Y_j^i}{\partial S_j} = \frac{\partial T_i\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial S_j} < 0 \; because \; \frac{\partial\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial S_j} < 0 \tag{4.11}$$

$$\frac{\partial ET_j Y_j^i}{\partial M_j} = \frac{\partial T_i\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial M_j} < 0 \; because \; \frac{\partial\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial M_j} < 0 \tag{4.12}$$

$$\frac{\partial ET_j Y_j^i}{\partial \varepsilon_j} = \frac{\partial T_i\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial \varepsilon_j} > 0 \; because \; \frac{\partial\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j)\right]}{\partial \varepsilon_j} > 0 \tag{4.13}$$

The last partial derivative of equation (4.6) with respect to W_j yields the following results;

$$\frac{\partial ET_j Y_j^i}{\partial W_j} = -p_j \frac{\partial T_i\left[Y_j^i(C_j,S_j,M_j,\varepsilon_j) - f_j(F_j,W_j)\right]}{\partial W_j} \frac{\partial f_j(F_j,W_j)}{\partial W_j} \tag{4.14}$$

Recall that the formulation in equation (4.6) implies that temptations are not directly influenced by variations in social standing (W_j). There are, however many indirect and distant possibilities that W_j may have impact on individual j's temptations. First, equation (4.6) implies that variations in W_j effects f_j, since $\frac{\partial f_j(F_j,W_j)}{\partial W_j} > 0$. In turn, an increase in f_j while keeping $Y_j^i(.)$ constant implies

a reduction in temptation (i.e. $\frac{\partial T_i[.]}{\partial W_j} < 0$) and hence the sign of equation (4.14) is positive (i.e. $\frac{\partial ET_j Y_j^i}{\partial W_j} > 0$). Second, an increase in W_j may provide attractive opportunities to the individual which means an increase in ε_j. Since $\frac{\partial Y_j^i(.)}{\partial \varepsilon_j} > 0$ in equation (4.4), and given that $f_j(F_j, W_j)$ is kept constant, this would increase temptations (i.e. $\frac{\partial T_i[.]}{\partial W_j} > 0$) and the sign of equation (4.14) would be negative. A third possibility exists in how W_j effects S_j. Then the sign of equation (4.14) depends on whether variations in W_j affect the useful or detrimental S_j. In summary, the sign of equation (4.14) depends on several important considerations and it cannot be signed at priori.

At the end, a caveat in such modeling deserves mention. Block & Heineke (1975, p.323) have long mentioned that "*policy recommendations do not follow from theory but rather require empirical determination of relative magnitudes*". However, it does not reduce the utility of modeling effort and can be very valuable in identifying variables that should enter an individuals' decision process (Witte, 1980, p. 62).

4.4 Preposition/hypothesis stemming from ARAM

Since the theoretical framework identified several important variables that influence an individual's decision process, many testable hypotheses can be deduced from this theoretical framework. Some of the hypotheses directly stem from the first order conditions of equation (4.6), others are based on the interactions of two or more variables. These hypotheses are listed below.

1. Perceived probability of detection and participation in criminal activities are inversely related.
2. Perceived severity of punishment has an ambiguous effect on the decision to participate in criminal activities, it could be positive or negative or even null.
3. Improvements in useful human capital exert a negative influence on participation in criminal activity.
4. Having useful social capital reduces the temptations to participate in criminal activity.
5. Individuals high on morality scale are less prone to criminal activity than those with lower morality.

6. Opportunities and setbacks have the effect to expose the otherwise immune individuals to criminal activities.
7. Individuals high on morality need very little deterrence in the shape of Pj and Fj to avoid criminal engagement.
8. Associated with the previous hypothesis, for crime types characterized by social acceptance, Pj and Fj must be very high to deter crime.
9. For individuals having higher stacks in conformity, a less severe punishment would deter participation in criminal activities (based on the second interpretation of equation 4.14).

4.5 Conclusion

Comparing the model developed above with the existing models of crime, one may feel that the focus is being shifted to more distant factors than the earlier models. The earlier models assume that, besides P and F, legal and illegal income opportunities effect crime. Education and unemployment are considered indirect influences which, first effect legal and illegal income and then crime. Considered in the usual since of economics models of crime, the focus on human and social capital are surely distant factors. That is, human and social capital affects employment, employment effect legal and illegal income, and then legal and illegal income will affect crime. Sociologist trained criminologist even go further deep to study factors that affect human and social capital and their effect on crime. So, the model in this study is in between the polar cases which is perfectly justifiable, given the policy-oriented focus of the study. The formulation in this study gets the usual economics model of crime a step closer to sociologist trained criminologists theories. The same extension also enlarges the policy tool kit over and above the criminal justice system variables which adds to the economists' models of crime.

The explanations and implication of the model (ARAM) are not necessarily in conflict with some other recent models of crime. Indeed, many of the other explanations of crime leads to the same conclusions as ARAM. For instance, the broken windows theory of Wilson and Kelling (1982) states that social and physical disorder is associated with serious criminality. Very true but social and physical disorders are not causes but symptoms of the true causes of criminality. In most of the areas characterized by social and physical disorder, majority of the people will have low human and social capital and may have moral values that are quite different from those of the middle class. Such areas are also characterized by setbacks. Having all those four criminogenic factors, it

is natural to expect serious criminality originating from such areas. Similarly, the general strain theory posits that crime results from strains such as the failure to get high goals, the actual or threatened loss of positively valued stimuli, and the actual or threatened presentation of negatively valued stimuli. ARAM implies that individuals with low human and social capital are the most likely to fail in achieving their valued goals (the first source of strain in GST). The other two sources of strain could be considered as setbacks in ARAM. ARAM however, does not focus entirely on strains which results from negative treatment as does GST. The focus of GST on strains resulting from negative treatment by the society makes the theory very weak to explain all types of crimes. That is, strain as discussed by the theory may be a motivational factor for crimes involving anger, but it could not explain white collar and many other economic crimes.

Tittle's (1995) control balance theory is another recent theory that leads to the same conclusion that ARAM does. For example, the theory states that control imbalances (setbacks in ARAM) provokes (temptations in ARAM) certain individuals to commit crime. These provocations are, however, conditioned by social and environmental factors such as opportunities and retaliations (both legal and social). The individual quickly contemplates, though not necessarily in a rational manner, the potential gains in control from these possible actions as opposed to the potential losses in control their commission might imply. When the balance appears favorable for a gain in control, the individual engages in some opportune deviant behavior. There are however, importance differences in control balance theory and ARAM. The central variable of the theory is provocation. That is, control imbalances provoke individuals to do something to alter the control imbalance. Tittle (1995) calls the theory general enough to cover all types of crimes, be that delinquency, white collar or blue-collar crimes. But the theory's focus on provocation leaves a huge hole in its explanatory power. For example, many white-collar crimes, such as corruption, seldom results from control deficit or control surpluses that might provoke the individual to gain control. Moreover, the theory offers very little (over and above what is usually recommended by deterrence theories) substance for policy formulation. Overall, the theory is very much in the rational actor tradition except that certain individuals (with control imbalances) are predisposed to criminality. The theory, however, fails to focus on factors that predisposes certain individuals to criminality. Most importantly, control imbalances are not easy to measure as compared to setbacks and opportunities in ARAM.

As discussed in the literature review chapter, ARAM closely resembles the Situational Action Theory (SAT) of Wikstrom (2004). ARAM however, differs from SAT in several important aspects. In SAT, moral values do not affect temptations. That is, the theory implies that if someone's moral values are such that a particular action is not considered an action alternative, then temptations for that particular act are zero. In effect, the theory clearly divides the population in two mutually exclusive groups; those whose temptations for a particular action are positive, and those whose temptations are zero. This may not be true of temptations. As oppose to SAT, ARAM consider moral filters to be one of the arguments that effects temptations with respect to various action alternatives. This formulation does not rule out cases where moral filter strictly prohibit an action alternative (a case where temptations for the action alternative are zero in SAT), but this does not mean that temptations becomes zero. Temptations are considered a function of four variables; human and social capital, morality and opportunities. In ARAM, it is possible that an act is strictly prohibited by moral values, but the other factors may be exerting more influence such that, on balance, temptations are positive.

SAT's stress on morality as the most important variable in explaining criminality leaves an array of crimes unexplained. For instance, it is unreasonable to think of the moral values of prostitutes as entirely different from those of the general society. Prostitution is generally considered an immoral act by those involved. SAT fails to explain such an involvement, but ARAM does have an explanation for it. According to ARAM, prostitutes consider the act to be immoral, but their personal and social capital is such that they cannot earn a living outside that business. Similar cases can be made for pornography, masturbation, child labor, and allowing cheating in academic institutions. Consider the case of allowing cheating in academic institutions. There is no dearth of empirical studies that reports widespread cheating in academic institutions (e.g. see Murdock, Beauchamp & Hinton, 2008; Sorgo et al., 2015; Malesky Jr, Baley & Crow, 2016; and Miller, Murdock & Grotewiel, 2017) and that teachers, aware of the fact of cheating, overlook it (Graham et al., 1994; Keith-Spiegel et al., 1998; Whitley & Keith-Spiegel, 2002), although they consider cheating to be immoral and unethical. Child labor is a crime in many countries and is very painful for many parents in developing countries, but cost benefit considerations outweigh the pains created by morality when parents actively encourage their children to augment the meager household resources. Viewing porn movies and engaging in unlawful sexual behavior is very

painful afterwards, but having opportunities, very few of us are inhibited by the moral forces from the acts. ARAM claims to explain such types of crimes as well.

Chapter 05

Methodological Framework and Data Description

5.1 Introduction

This chapter sets the road map for the rest of the thesis. The chapter starts with a specification of the Criminometric equation that stems from ARAM and would serve the subsequent empirical analysis. Criminometric specifications are routinely studied with macro level data, resulting in several undesirable deficiencies in empirical research. Hence a section is added in this chapter which discuss problems in using macro level data (and advantages of micro level data) for estimating Criminometric specifications. The chapter then outlines the geographical focus of the study and how various samples are collected from distinct stratums within the area. Further, the data collection tool and the empirical framework used for analysis are also detailed in this chapter.

5.2 Criminometric Specification

While developing ARAM in chapter four, $T_j Y_j^i$ is defined as individual's j temptations to acquire his/her valued goals through illegal means (or temptations to offend). Temptations are however unobservable and hence difficult to measure (unless acted upon). The counterpart of temptations to offend that could be used for empirical purposes is thus whether or not the action is taken. Defining O_j to represent individual's j action (or otherwise) on temptations, the theoretical model in chapter four facilitates the following Criminometric specification.

$$O_j = \alpha_0 + \beta C_j + \gamma S_j + \delta M_j + \theta P_j + \vartheta F_j + \pi \varepsilon_j + U_j \qquad (5.1)$$

Cj is human capital embodied in individual j, Sj is his/her social capital, Mj is morality, Pj and Fj are perceived probability of detection and severity of sanctions respectively, ε_j is the set of opportunities/setbacks and Uj is the error term.

5.3 Data

Complications in testing theoretical models of crime, due to non-availability of suitable data, have long being recognized (Manski, 1978). Theoretical models are usually tested with either records of criminal activity compiled by the CJS or with self-reported crimes data (Eide, Rubin & Shepherd, 2006). In recent years, a third type of data source is also used which is collected as

responses to vignettes. The later types of data (i.e. self-reports and vignettes) are at individual level while criminal records are compiled at macro level.

The biggest and foremost problem with the data compiled by the criminal justice system is the issue of "dark numbers". Dark number represent crimes that are either not reported to the police or not recorded by the police as crimes (Pudney, Deadman & Pyle, 2000). Under-reporting in reported statistics has long being recognized an issue that has curtailed the ability of criminologists to study crime (Coleman & Moyniham, 1996; Wolff & Baglivio, 2017). Earlier studies (e.g. see Wallerstein & Wylie, 1947) had reported that more than 50 percent of their samples accepted committing punishable crimes but were not reported. Recently, Corbacho, Philipp & Ruiz_Vega (2015) reiterated the problem of dark numbers in official statistics by stating that about 90 percent of the punishable crimes in Mexico are not reported to the police. Evidence from Pakistan (see Razzak & Luby, 1998) suggests that police records under represented the number of death rates by 44 percent.

Under reporting in crime statistics is usually associated with mistrust on police (Islam, 2016), low quality of police force (Fajnzylber, Lederman & Loayza, 2002; Brush, 2007), types of crime (Soares, 2004; Altindag, 2012), low levels of citizens` education (Fajnzylber, Lederman & Loayza, 2002), and low levels of economic development (Levitt, 1998; Kelly, 200; Soares, 2004). Besides under reporting, the police have also a "vested interest" (i.e. to appropriate larger budgets) to over report crime statistics (Seidman & Couzens, 1974; Benson, Kim & Rasmussen, 1994). In addition to effecting probability of arrest and sanctions in the reverse direction (Cook, 1977; Viscusi, 1986), errors in measurement of crime generate dynamically complex biases (Pudney, Deadman & Pyle, 2000). And given that errors in measurement are associated with levels of development, any relationship between crime, income and education estimated based on reported crime statistics may be spurious.

The second problem in empirical studies based on macro level reported police data is that these studies assume perceived arrest risk to be perfectly reflected in objective arrest risk. The objective arrest risk, known as clearance rate, is typically measured as a ratio of country level total arrests to crimes known to the police (Kleck et al., 2005; Lochner, 2007). However, the clearance rate is not a valid measure of the perceived arrest risk for two reasons. First it does not represent the arrest risk for criminal chances that are not acted on (Cook, 1979; Nagin, 2013; Nagin et al., 2015).

Second the country level clearance rate may not represent a true risk arrest at specific location where potential criminals are likely to offend (Pogarsky, 2009; Apel, 2013). Hence arrest risk, at best, can be seen as a measure of the average probability of punishment for already committed crimes (Cook, 1980). There are several other shortcomings in using macro level police data to test theories of crime and are discussed earlier.

There are several important arguments to conduct empirical research at the individual level (Entorf & Spengler, 2000). As pointed out by Halicioglu, Andres & Yamamura (2012), the only reason to estimate crime equations using aggregate data should be the non-availability of the individual level data. According to Sellin (1931), "the value of a crime rate for index purposes decreases as the distance from the crime itself in terms of procedure increases". Besides close observations (which is impossible because criminal seldom advertise their activities), self-reports of criminal activity would be the closest source of data for the actual behavior (Thornberry & Krohn, 2000). Similarly, many statistical problems discussed in relation to macro level studies are absent when such models are estimated using individual level data (Eide, Rubin & Shepherd, 2006). For example, using aggregate data, one comes across the issue of reverse causality in crime rates and police arrest statistics. In empirical researches at the individual level, it can practically be considered that the probability and severity of punishment is determined independent of the actions of an individual. Thus, the deterrence variables can be exogenous to the individual's choices, and the problem of simultaneity inherent in macro studies is absent (Eide, Rubin & Shepherd, 2006).

Generally, individual level data is either collected as self-reports or as responses to hypothetical scenarios. Both methods of obtaining crime data are preferable as compared to the reported statistics but both methods, as used in previous studies, have problems of their own. For instance, vignettes are criticized for whether the responses resulting from hypothetical scenarios represent respondent's own responses or of the person presented in the vignette (Piquero & Tibbetts, 1996; Pogarsky, 2004; Fox, Nobles & Lane, 2016). Similarly, self-report measures may be inaccurate due to decaying of memory (Fox, Nobles & Lane, 2016) or due to the casual error that results from temporal ordering (Silberman, 1976). Temporal ordering error states that perceptions at one point in time cannot influence manners at an earlier point in time. Besides this, given that criminals are less likely to speak of their behavior fearing from punishment (Farrington, 1982), any measure of criminal behavior is bound to be imprecise (Ellis, 1998). However, as observed above, individual

level data is much superior to the macro-level data and hence this study use primary data to estimate various forms of equation (5.1). To this end, the study makes use of a well-designed survey which is outlined as follows.

5.3.1 Survey Design

The recent history of the entire country is full of turmoil, but the province of Khyber Pakhtunkhwa is especially the most inflicted area of the country. Starting after 1970's, terrorism (being the most serious of crimes) spread in the entire province like a wild fire. Although the study doesn't aim to study directly the factors behind terrorism, but there is ample evidence (e.g. Crenshaw, 1981 & Zaidi, 2008) that terrorism is strongly correlated with other types of crimes. This makes Khyber Pakhtunkhwa an attractive area for the type of study at hand.

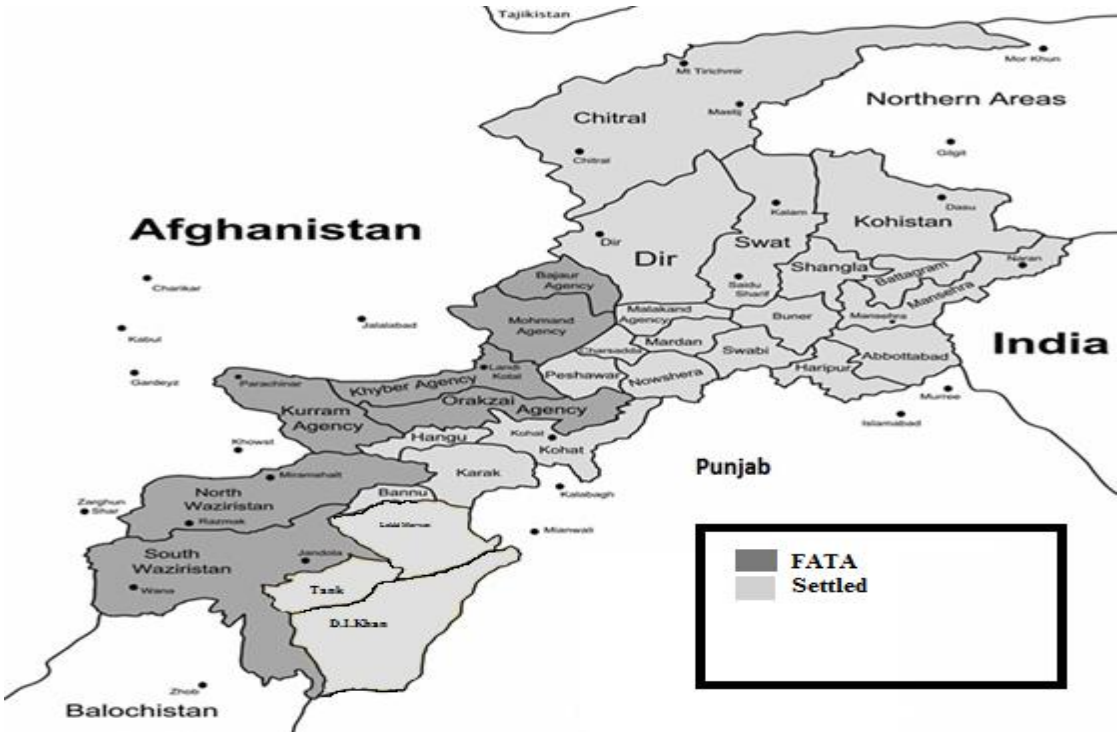


Figure 5.1: Map of Khyber Pakhtunkhwa and FATA

The province of Khyber Pakhtunkhwa has covered more than 74,521 square kilometers and has estimated inhabitants of 21 million. The province is divided into three administrative parts; Settled area, Federally Administered Tribal Area (FATA) and Provincial Administered Tribal Area (PATA).

a. Target Population

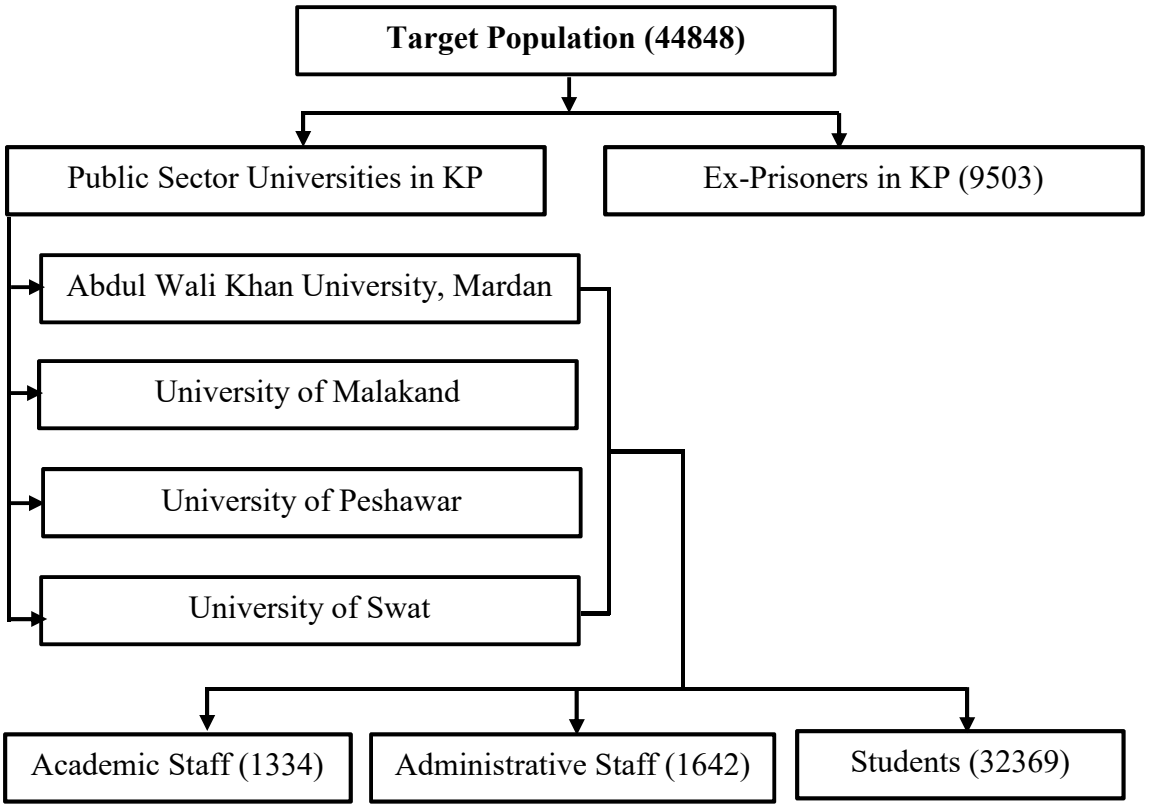
The survey is conducted in the settled areas of the province, including the provincially controlled tribal areas. The inclusion of FATA would have added to the value of this study, but the situation in the area and the ongoing military operations, it was difficult to get approval for the survey in that area. Initially, and in line with the objectives of the study, the study aimed at collecting information from (samples of) two sets of populations; total number of prisoners' in prisons and the total number of households in the study area. Previous research in the field has favored offender-based studies as opposed to relying solely on official statistics (Wright & Decker 1994, 1997; Topalli, 2005; Bernasco 2010; Copes & Vieraitis 2012; Jacques & Wright 2012). The offender-based studies are useful for obtaining firsthand information from those who are involved in crimes.

Purely population-based studies (as is routine in delinquency research), on the other hand, has been severely criticized. It has been observed that samples of purely population-based respondents consist of law abiders (Apel & Nagin, 2011; Apel, 2013). Although such criticisms have been recently answered by Pickett & Roche (2016) and by the fact that "the rational choice perspective makes no hard-and-fast distinction between offenders and the law abiding," but rather considers that even "people who have generally avoided criminal choices might cease to do so in the face of overwhelming need or temptation" (Clarke & Cornish, 2001), an attempt has nevertheless being made to include diverse people in the sampling frame to avoid such criticism. This attempt however is curtailed by our inability, despite repeated efforts, to convince the prison administration and the directorate of social welfare of the province to allow data collection from their respective jurisdictions. The sampling frame that emerges from the above deficiencies is given in figure 5.2 below.

This study aims to test the Augmented Rational Actor Model in different contexts (i.e. various types of crimes such as academic dishonesty, white-collar crimes, property crimes and violent crimes). In line with the objectives, the target population include public sector universities in KP (to cover academic dishonesty and white-collar crimes) and ex-inmates of the prisons in KP. Within the universities, total population was sub-divided between academic staff, administrative staff and students. As already mentioned, efforts have been made to get access to prisons to get a captive population, but such efforts were futile. Alternatively, data on ex-inmates have been

obtained from two prison facilities on the guarantee that the names of officials providing the data would not be disclosed. The list of ex-inmates provided included, predominantly, only male offenders. Therefore, the directorate of Social Welfare was contacted to get permission for interviewing run away female within the shelter homes. Unfortunately, the directorate also (technically) refused to cooperate.

Figure 5.2 Target Population



b. Sample Size Determination and Allocation

Following Cochran (1977) for selecting an optimal sample size for the study, the optimal sample sizes for various levels of risk margins (α) and margin of error (d) are given in table 5.1 below. Amongst other things, the calculations are based on the following important assumptions;

1. Simple random sampling
2. The sample would be used for estimating proportions and means.
3. A 100 percent response rate
4. Data collection involves no cost

Table 5.1 Optimal sample size

Dichotomous variable case	α=d= 1%	α=1% & d = 3%	α = 1% & d = 5%	α =2% & d = 1%	α = 2% & d =3%	α=2% & d = 5%	α =5% & d = 1%	α =5% & d = 3%	α =d =5%
(n_0)	16641	1849	665	13572	1508	542	9604	1067	384
Percent of N	37	4.12	1.49	30	3.36	1.21	21.41	2.37	0.85
FPC	12137	1775	655	10419	1458	536	7910	1042	380
Design effect (1.18)	14322	2095	773	12294	1722	632	9333	1229	449
Oversampling (22%)	17473	2556	944	14999	2100	772	11387	**1500**	548

Note: *FPC stands for Finite Population Correction*

Since the design used in this study is not simple random sampling[22], the efficient sample size may also vary. As compared to other sampling methods, stratified random sampling is said to reduce sampling variability but never eliminates it (Stuart & Ord, 2010). To account for this issue, the use of the design effect is recommended (Henry, 1990). Depending on the number of stages in the sampling design, a design effect is predicted to range from 1.3 to 1.06 (Kalton, 1983; Henry, 1990). That is, as the number of strata's increases, the design effect decreases.

Moreover, since we intend to use the sample data for factor analysis and regression analysis, the optimal sample size needs additional considerations. For regression analysis, a conservative ratio is that there should be ten observations for each of the independent variable in a regression specification (Halinski & Feldt, 1970; Miller & Kunce, 1973; Long & Freese, 2006). Factor analysis requires that the number of observations should be at least 100 (Hair et al., 1995). Since our optimal sample size fulfills both requirements, the factor analysis and regression analysis are expected to produce unbiased results.

Similarly, it is recommended to oversample for surveys based on mailed questionnaires to account for the non-response (Cochran, 1977; Fink, 1995; Salkind, 1997). Although the study used interview method (in most cases) as a data collection method, the optimal sample size is oversampled by 22 percent. Last but not the least, there were practical issues involved in selecting

[22] The study utilizes a complex design and make use of stratified, quota and convenient/voluntary response sampling techniques for the selection of respondents.

an optimal sample size. A sample size recommended by 1 percent margin of error and risk may be the most desirable but collecting information from such a sample may not be feasible given the cost, time and other resource limitations.

Thus, keeping in view all the issues related to optimal sample size selection, the study used n = 1500 as the sample size (Based on α = 5 percent and d = 3 percent, 1.18 as the design effect and then oversampling by 22 percent). Following quota sampling, the total sample size of 1500 is divided equally amongst the three types of populations, i.e. ex-inmates, university employees and students. Further, convenience/voluntary response sampling is used for selecting respondents until the quota is reached.

c. Data collection tool and procedure

As already mentioned in this chapter, criminals rarely advertise their participation in criminal activities (Farrington, 1982) and hence collecting data on criminal behavior is a tedious job. Besides anonymity of the respondent, the way questions are asked may also affect the accuracy of responses. In this regard, some researchers prefer self-administered questionnaires while other favor face to face interview as a method of data collection. In the same way, some maintained that anonymous answers are better than non-anonymous answers. To know objectively the advantages of these alternative methods, Hindelang, Hirschi & Weis (1981) assigned respondents to select one of the four situations: identified interview, anonymous interview, identified questionnaire, and anonymous questionnaire. Their outcomes show that there is no strong method effect in creating self-report responses (see also Krohn, Waldo & Chiricos, 1974). Other similar studies (e.g. see Aquilino & LoSciuto, 1990; Turner, Lessler & Devore, 1992) however report a method effect and recommend self-administered questionnaires, followed by face to face interviews and telephonic interviews. Such method effects are however of negligible magnitude (Thornberry & Krohn, 2000).

This study makes use of three distinct well-structured questionnaires/interview schedules - designed by the author himself - one each for university students, employees and ex-inmates. Although an enumerator was present wherever (and from whomever) data is collected, the questionnaire contained other features to ensure anonymity and truth telling in responses. Before filling/responding to various questions in the questionnaire, the enumerator read loudly (or help understand where respondents were literate) the instructions given at the start of the document.

First, the enumerator explained to the respondents that participation in the survey is entirely voluntary and that they can return the empty questionnaire after reading/understanding the entire page of the instructions of the document. The page of the instructions outlined in detail that how anonymity of the respondents is ensured in the document. The questionnaire contained no such information that might be linked with the respondents in any way. Additionally, the respondents were informed that the information collected will be grouped with others and results will only be published in aggregate form. Thus, any information given will be completely anonymous and could never be linked with the personality of the respondents.

The page of instruction also contained information about the truth telling incentives and other prize schemes that were included to encourage participation. The participants were told that parts of the questionnaire are based on the Bayesian Truth Serum (Prelec, 2004), which is a modern technique to estimate the percentage of truth in responses. Thus, the more your responses are based on truth, the more you will earn. The maximum amount that a respondent could earn by honest responses was Rs. 1000 each. The other two prize schemes were basically multiple price lists, one for measuring time preferences (Holt & Laury, 2002; Meier & Sprenger, 2009; Andreoni & Sperenger, 2012) and the other for measuring risk preferences of the individual respondents.

The first multiple price list (to measure time preference) included ten alternative sets of payment option. Each alternative option set contained a sooner but smaller payment and a later but larger payment. In each subsequent sets of payments, the later but larger payment was increased by 10 percent. Respondents were asked to choose one of the options in each given set. The maximum and minimum prize varied for students and other participants. The minimum prize associated with this price list for students were Rs. 500 and the maximum of Rs. 1000. The minimum and maximum prize money for employees and ex-inmates was Rs. 1200 and Rs. 2400 respectively.

Similarly, the second price list (to measure risk preferences) also included ten alternative sets of payment options. But as opposed to the first price list, the second price list contained two lotteries with given probabilities of earning certain amounts. Each decision contained a choice between two lotteries (A and B). If the respondent chose A in the first set, it meant that the respondent has 10 percent chances of winning Rs. 580 (1600 for employees and prisoners) and 90 percent chances of winning Rs. 480 (1280 for employees and prisoners). But if the respondent chose B in the first set, then he/she has 10 percent chances of receiving Rs. 1200 (3022 for employees and prisoners) and

90 percent chances of receiving Rs. 36 (91 for employees and prisoners). Again, the respondents were asked to choose one option in each of the 10 alternative lotteries. Each questionnaire contained a numbered coupon (same number as on questionnaire) and participants were asked to keep the coupon until the lucky draw. Ten percent of the respondents – who choose to participate in the prize schemes - were selected through lucky draws and were paid the promised amount as per their selected time frame.

Before going into further details of the questionnaire, it is imperative to mention a few related things which concerns the quality of the survey documents used in the study. First, testing for the test-retest reliability of the whole questionnaire was neither possible nor desirable. Majority of the measurement scales used in the questionnaire have known reliability. However, the self-reported crime inventory based on the Bayesian Truth Serum is new and is not being used in the previous research. Therefore, the self-reported crime inventory (which is explained in section 5.3.3 below) was tested for test-retest reliability on 31 students of BS Economics at University of Malakand. First, 35 students were given the self-reported crime inventory and were asked to fill the form. The same inventory was again given to the same students (31 of them were present on the day) after a gap of three days. The responses of the 31 (out of 35) previous inventories were correlated with the new 31 inventories and the correlation coefficient turned out to be approximately 0.73 which is an acceptable level for test-retest reliability (Thornberry & Krohn, 2000).

Similarly, all the three questionnaires were translated in Urdu and were given to six employees of the University of Malakand (all having working knowledge of Urdu) and 19 O-level students of ICMS school and college Timergara for possible revisions. The employees of Malakand University suggested valuable revisions in wording but were not able to apprehend the prize schemes on their own. The 19 O-Level students generally understood the content of the document except the prize schemes. Hence revisions in wording were made as per suggestions and two additional scales were included in the questionnaire to measure time and risk preferences of the individuals.

Lastly, previous research based on self-reported data has questioned the temporal ordering of questions (e.g. see Silberman, 1976). To account for the temporal ordering of the questions, enumerators were trained to ask general questions before the perception questions, and the perception questions before the self-reported crime questions.

5.3.2 Execution of the survey

For data collection, two teams comprising of three members each were hired and trained by the author. Besides clarifying some minor technicalities in the interview schedule, the training of enumerators predominantly focused on how to incentivize participation and how to develop rapport with the respondents. Enumerators were told to explain the purpose of data collection (which was also detailed on the instructions page of the schedule) in detail and use language such that empathies of the respondents are appealed. For example, enumerators were told to persuade the ex-inmates by telling them that "*we are looking for individuals who has the basic knowledge of the criminal justice system (rather than telling them that we know you are an ex-inmate). Since we have been told (by the Union Council Nazims) that you are proficient in the system, we would like you to share your wisdom with us*". Similarly, university employees were persuaded by appealing to their accumulated knowledge and experience and students were persuaded by telling them that you are the future policy makers of this country, so why not start influencing policy from today by participating in this survey.

Once developing rapport and persuading the respondents to participate in the survey, they were handed over the questionnaire for reading the instruction page (the entire instruction page was verbally communicated to illiterate respondents). The instruction page also started with highlighting the importance of the study and of the information that the perspective participant is going to provide. Then characteristics of the document were outlined which were meant to ensure anonymity of the respondents. The instruction page also included details of the incentives that could accrue to the respondents because of their participation in the survey. To ensure maximum cooperation, enumerators were trained to ask general questions first, then followed by perceptions questions. Self-reported crime questions and its BTS counterpart are asked at the end of the interview session.

Collecting data from the students was the easiest which may be due to several factors. It may be the case that the financial incentive for them was attractive[23] or may be due to the presence of one of their professors. Collecting data however, from ex-inmates and university employees was the

[23] Although not originally planned, we observed in the field that most of the respondents wanted cash payments. So, a cash payment of Rs. 400 was given to each participant who did not wanted to participate in the prize schemes.

hardest. University employees either rejected participation altogether or played tricks with the enumerators. Since most of the employees asked enumerators to collect the questionnaire after one or two days, we found several returned questionnaires (mostly from University of Peshawar) in which the self-reported crimes page was missing.

Collecting data from ex-inmates was difficult but not due to non-cooperation. The amount of money on offer (i.e. Cash Rs. 400 if the respondent did not want to participate in the prize schemes) was equivalent to a complete day wage rate of most of the ex-inmates while the interview took at most two hours[24]. Once identified and contacted, enlisting their cooperation was quite easy. However, the identification of ex-inmates took a great deal of effort. As mentioned before, the list of ex-inmates was obtained from two prison facilities of the province. The information contained in the list however was deficient to trace the ex-inmates. It included information on the type of offence committed, the police station where report was filed against the offender, the First Information Report (FIR) number, time spent in prison, and name of the offender. In order to identify and contact the ex-inmates, help was taken from the police department. The police department generously helped in providing addresses and contact numbers from their FIR files. The contact numbers are then used to take an appointment from the ex-inmates for the interview. Upon fixing an appointment, an enumerator was sent to interview the corresponding respondent. Given the dangerous nature of some of the respondents, Nazims of the respective union councils were asked for help which they generously provided.

5.3.3 Measurement of Variables

a. Self-reported offending

The questionnaire asked respondents to specify their involvement in several listed (criminal) activities in the past twelve months. The nature and number of listed criminal activities varied in the three questionnaires. For instance, the questionnaire used for students included a total of 27 criminal activities considered as academic dishonesty (7 items), property or campus crimes (7 items), violent crimes (5 items), other minor crimes (6 items), cybercrimes (1 item) and public

[24] Ex-inmates from rural background were more cooperative as compared to those from urban backgrounds. Ex-inmates from urban background were smarter in demands. Given the limited budget, their demands cannot be fulfilled and hence majority of the ex-inmates in the sample are from rural backgrounds.

order crimes (1 item)[25]. The questionnaire used for collection of data from university employees consist of a total of 21 criminal activities. Of the 21 listed activities, 3 items represented academic dishonesty (AD), 13 items represented property/white-collar crimes (WC), and 5 items from other crimes (OC). Questionnaire used for ex-offenders mostly included VC (11 items), followed by PC (4 items) and OC (2 items). A complete list of criminal activities considered in each questionnaire is given in the appendix 03 and are also discussed in the relevant sections of the next chapter. Respondents in each category indicated their involvement or otherwise in the listed activities by choosing either "yes" or "no".

Asking respondents about their personal private information in this fashion, although a routine in criminology research (e.g. see Cochran, 2015, 2016; Seddig, 2016; Walters, 2016; Curcio, Mak & George, 2017), may not be an appropriate way of soliciting truthful responses. Since people seldom speak honestly about their own private information, Prelec (2004) recommends an indirect way of knowing about people's private behavior. Prelec (2004) points to a psychological principle that whenever people speak about other people's behavior, they convey important information about their own behavior. If asked directly, a respondent is more likely to deny participation in a criminal act. Thus, it is better to ask people about other's people (average) behavior (as well). So, if a respondent denies his/her own participation/involvement in a criminal activity, but at the same time his/her estimate about other people's involvement is very high, let say more than 80 percent, it implies that his/her response with respect to his/her own participation is dishonest. Besides Bayesian Truth Serum (Prelec, 2004), many sociological theories of crime would also agree with this implication. That is, if a respondent's estimate of other people's involvement in a criminal activity is very high, it implies that the act is considered widespread and in effect is part of the general norms. In turn, something considered as part of general norms makes the acts normal for an individual and his/her likelihood of participation increases. Both BTS and the general norms mechanism lead to the same conclusion; a higher estimate about other people's involvement in a given criminal act implies a higher probability of the respondent's own involvement. Denial in such a case can be considered a dishonest response. In line with this reasoning, and beside directly asking, respondents were thus also asked to give a rough estimate (in percent) of other people's

[25] The questionnaires used for students and employees originally included some items for violent crimes but are dropped from analysis due to no corresponding items in the probability measures.

involvement in each listed criminal activity. BTS responses are however only used to check truthful responses (by correlating it with self-reported offending) and not in estimating the models.

b. Human Capital

Given the definition of human capital, it is a difficult variable to measure (Abowd et al., 2005). Some researchers measure HC by means of the income-based method (e.g. Jorgenson & Fraumeni, 1989, 1992; Eiling, 2013) which assumes that human capital and labor market income are linearly and directly related (Lustig & Nieuweburg, 2008). Other studies measure human capital directly by the amount of investment in education (e.g. Duraisamy, 2002; Psacharopoulos & Patrinos, 2004). There are still some other researchers who proxy human capital directly by years of education and/or experience.

The income-based methods of measuring HC are based on the idea that HC embodied in an individual can be approximated by his/her (discounted) life time earning potential. Jorgenson & Fraumeni (1989, 1992) method is frequently used to derive the income-based estimates of HC, which consider learning to be the main determinant of life time earnings. However, this method is criticized on the basis that the method ignores variations in personal endowments resulting from nature and nurture (Ahlrothet al., 1997; Dagum & Slottje, 2000). Moreover, such measures of HC also ignore differences in school quality and program of study (Aaronson & Sullivan 2001).

Cost-based approach to measure HC (Kendrick, 1976; Eisner, 1985) divides human capital investments into tangible and intangible investments. The tangible components of investment in HC consist of those costs required to produce the physical human, starting with the child rearing costs to the age of fourteen. Intangible investments are the costs to enhance the quality or productivity of labor. These involve expenditures on health and safety, mobility, education and training, plus the opportunity costs of students attending school. The cost-based methods thus estimate the stock of HC by estimating the total cost incurred on HC. As compared to the income-based methods, the cost-based methods of estimating HC are subject of severe criticism. For instance, it is stated that there is no necessary relationship between investment and the quality of output. For example, an innately less able and less healthy child is costlier to raise, so the cost-based approach will overestimate his human capital while underestimating well-endowed children who, all else equal, should incur fewer rearing and educational expenses.

A comprehensive review of the income and cost-based measures is given in Le, Gibson & Oxley (2003, 2006) which discuss several other (but similar) measures as well. All such measures, at best, can measure part of HC at the cost of ignoring many other components of the same concept. Given the complexity of the concept, Quinn (1994) observes that no single metric can adequately and sufficiently measure HC and recommends multiple measures. In line with these recommendations, the study utilize multiple measures, as well as a single metric build from multiple indicators, to measure human capital. The measures of HC for the three groups of respondents (i.e. students, employees and ex-inmates) used in the study differ in minute details which are explained below.

The measure of HC for students does not include years of schooling as an indicator because most of the respondents are from the same education level. It includes a ***food security scale*** (to capture health of the respondents), a quality of parenting scale (to capture the acquisition of HC at home), a school commitment and quality scale (to capture the acquisition of HC at school), and personality inventory (to capture various attitudes and motivations towards work). The food security scale contains 19 items covering various dimensions of household level food security. Respondents were asked to rate the 19 statements about their household according to a seven-point Likert scale (1 = never true about my household to 7 = always true about my household). Similarly, the quality of parenting scale included 18 items (such as, during my teen age, my parents did not help me as much as I needed). Respondents were requested to rate their parents' manners on a seven-point Likert scale (1 being never true of my parents to 7 being always true of my parents). The ***quality of parenting scale*** included some items from the parental attachment scale (Developed by Klimidis, Minas & Ata, 1992 and used by Simons et al., 2014; Svensson, 2015; Piquero et al., 2016; Yulsek & Solakoglu, 2016; Curcio, Mak & George, 2017; Svensson et al., 2017) and some from parental monitoring scale (Developed by Steinberg et al., 1992 and used by Svensson, 2015; Walters, 2016; Svensson et al., 2017).

The school quality and commitment scale (like the one developed by McNely, Nonnemaker & Blum, 2002 and used by Loureiro et al., 2009; Svensson, 2015; Siddig, 2016; Yulsek & Solakoglu, 2016; Curcio, Mak & George, 2017; Svensson et al., 2017) includes 9 items (such as, "I feel close to people at the institution where I study"). Respondents were asked to rate their level of agreement with each statement on a five-point Likert scale which ranged from strongly agree (5) to strongly disagree (1).

To capture individual's attitudes and motivations towards work (as components of HC), the study utilizes the ***personality inventory*** of Zuckerman et al., (1993) and the ***self-control scale*** of (Grasmick et al., 1993). Since the two scales measure identical concepts, care has been taken to include only relevant items in the two scales and avoid measuring a given concept twice. Hence the two scales used in this study are modified forms of personality inventory and self-control scales. The personality inventory originally contains five sub-scales of which only the "***activity***" subscale is included in the questionnaire. Thus, the activity scale included a total of 9 statements (e.g. I do not like to waste time just sitting around and relaxing) and respondents were asked to rate (on seven-point Likert scale) how true is each statement with respect to their personality (1 being very untrue and 7 being very true).

The original self-control scale of Grasmick et al., (1993) include five subscales; impulsivity, laziness, risk affinity, masculinity, and self-centeredness. The questionnaires in this study utilize 12 statements from the self-control inventory; 6 statements relating to ***time preference*** and 6 relating to ***risk preference***. Time preference is measured through statements like "I often do whatever brings me pleasure here and now, even at the cost of some distant goal" and risk preference by statements like, "I sometimes find it exciting to do things for which I might get into trouble". Responses are rated on the same scale as for personality inventory.

The scales discussed above are used in all the three questionnaires with some minor modifications. Moreover, some statements in various scales are positive while others negative. The statements (either negative or positive) are then reverse scaled before inclusion in the analysis.

c. Social Capital

Social capital, like human capital, is a complex concept and renders measurement efforts very difficult (Buonanno, Montolio & Vanin, 2009). Empirical studies find that social capital is a collection of three main dimensions; generalized trust, civic norms, and associational networks (e.g. Knack & Keefer, 1997; Bjørnskov, 2006; and Buonanno, Montolio & Vanin, 2009). Similarly, Putnam (2000) argues that generally social capital refers to trust and social participation, whereas he further subdivides social participation into political participation, civic participation, religious participation, altruism, and volunteering. The most comprehensive measure of social capital to-date is the ***social capital inventory*** by Narayan & Cassidy (2001). This measure considers seven aspects of social capital; group features, generalized norms, closeness, routine

sociability, neighborhood contacts, volunteerism, and trust. To measure social capital (SCap), the questionnaire includes four of these seven aspects; group features, generalized norms, closeness, and trust.

Group characteristics are measured by five items covering membership in various group, financial and physical participation in the group, influencing the decisions of the group and socio demographic characteristics of the other group members. Generalized norms are also covered by including five items in the questionnaire. These statements related to how the respondents feel while dealing with other. That is, whether there is a sense of cooperation in the society or the respondent feels insecure with respect to dealing with other people. Togetherness is captured by two items and the level of trust in the community by ten items. Responses to some items (such as number of group memberships, number of times the respondent participate in group activities, and financial contribution) are recorded as absolute frequencies while others (such as the level of trust on various groups of the society) are rated on Likert scales. Moreover, the study also utilizes "parent's education (PE)" as a measure of social capital (in samples where variability in parent's education do exists). The PE variable is dummy coded variable where 1 implies that both mother and father of the respondent are educated and zero otherwise.

Beside these (positive) measures of social capital, the study also covers the ***perceived antisocial behavior of peers***. That is, respondents are asked to rate (on a five-point Likert scale) their peer's behavior with respect to various anti-social behavior. For instance, this section of the students' questionnaire asked the respondents to rate (1 = none to 5 = all) how many of their peers use cheating materials during exams. The perceived antisocial behavior of peers is measured through 9 such statements. The study calls the "perceived anti-social behavior" of peers as the primary measure of social capital as it is believed that social interactions with the peers are most important (than the measure proposed by Narayan & Cassidy, 2001) and must be more important in explaining antisocial behavior.

The perceived antisocial behavior of peers is a preferred measure, at least in the students and employees' sample, as compared to the social capital measure of Narayan & Cassidy (2001) because of three reasons. First, for students and employees, the items included in the social capital scale may not apply as most of the items asks respondents to rate various dimensions of social capital that are relevant outside the academic settings. Second, the social capital scale asks

respondents to rate the level of trust that can be placed on people in their own family, religion, groups and neighborhood. It is well understood that people may speak high of those listed groups due to social desirability and may undermine reality. Third, the measure renders itself to various interpretations. For example, higher social capital implies (in the usual sense) that committing a criminal act results in greater capital lost and hence SCap is expected to be negative. A positive SCap however is equally possible and dependable. That is, people (especially students and employees) with higher social capital may feel secure even when committing illegal behaviors. Given this, social capital may encourage criminal activities.

d. Morality

To measure morality, the study makes use of the ***moral disengagement scale***/moral foundation questionnaire of Bandure et al., (1996) and further developed by Graham et al., (2011). The moral disengagement scale has eight subscales named as; moral Justification, euphemistic language, advantageous comparison, displacement of responsibility, diffusion of responsibility, distorting consequences, attribution of blame, and dehumanization. These subscales are covered by 37 items where respondents were asked to rate their level of agreement with each statement on a Five-point Likert scale (1 being strongly agree and 5 being strongly disagree). However, the moral disengagement scale as a measure of morality is used in this study as a secondary measure. The primary measure of morality used in this study is the ***"perceived probability of personal sanctions*** (i.e. the feelings of guilt upon committing a criminal act)" and the "***perceived severity of personal sanctions***". These measures are explained in the following section with other sanction measures.

e. Sanctions Variables

In line with the theoretical implications of ARAM, the sanction variables are classified in three categories; legal sanctions, social sanctions and personal sanctions. Each variable, except personal sanctions, is considered as perceived probability measure. For instance, perceived probability of detection in case of committing crime, perceived probability of punishment given detection, and perceived severity of punishment. Detection probabilities are irrelevant in case of personal sanctions as individuals seldom commit crimes while unaware of the act. That is, detection of personal act is a sure event until and unless the individual is under the influence (cases which can be assumed away).

To measure ***perceived probability of detection***, both legal and social, respondents were asked to rate their perceived detection probabilities in case they commit the listed crimes. The listed crimes differed in each of the three questionnaires, depending on the relevance for each category of the respondents. For instance, the criminal acts included in the students' questionnaire most closely related to academic dishonesty or other related campus crimes. Crimes included in employees' questionnaire were mostly property and white-collar crimes and those included in the ex-inmate's questionnaire were violent and property crimes. In each questionnaire, respondents were asked to rate their perceived probability of detection, on a six-point Likert scale, in case they commit the listed crimes. The Likert scale ranged from 1 to 6, where 1 implied detection extremely unlikely and 6 implied detection extremely likely. ***Perceived probability of legal sanctions*** given detection was measured by asking respondents to rank their perceptions about the probability of escaping the punishment in case of committing the criminal acts (the same list of crimes as in case of detection). Answers were again noted on a six-point Likert scale where 1 implied escaping the punishment extremely unlikely and 6 implied escaping punishments extremely likely. The items are reverse coded before inclusion in the analysis. Therefore, higher values on the scale (after reverse coding) implies higher perceived probability of legal sanctions. Similarly, ***perceived severity of legal sanctions*** is measured by asking the respondents to rate the perceived severity of punishment associated with each listed crime if the authorities inflict the punishment on them in case of their involvement. Responses are recorded on a six-point Likert scale where 1 implied punishment to be less severe and 6 implied punishment to be extremely severe.

Perceived probability of social (extra-legal) sanctions is measured by asking the respondents to rate probability of losing respect of significant others that results from the commission of the listed criminal acts. Responses are recorded on six-point Likert scale where 1 implied very little probability and 6 implied extreme probability of losing respect in the eyes of significant others. ***The perceived severity of social sanctions*** is measured by asking respondents that how big a problem would it be to lose respect of others in case of committing criminal acts. Participants recorded their responses on a six-point Likert scale (1 implying no problem at all, 6 implying a very big problem).

Perceived probability of personal sanctions and ***their severity*** are measured in the similar way and are considered as primary measures of morality. To measure perceived probability of personal sanctions, respondents were asked to rate – on a six-point Likert scale - the degree of guilt/remorse

or personal discomfort that results from committing the listed criminal acts. On the Likert scale, 1 represented extreme guilt/remorse or personal discomfort and hence all the items are reverse coded before analysis. Likewise, the perceived severity of personal sanctions is measured by asking the respondent to scale the severity (in terms of creating personal problems) of personal guilt/remorse/discomfort that results from offending.

f. Opportunities/Setback Variables

The study uses discrimination scale, awareness about the criminal justice system scale and income inequalities to take account of the setbacks/opportunities structures of the individuals. To construct the income inequality measure, respondents were asked to report an estimate of the mean income in their neighborhoods as compared to their own. The income inequality measure is then computed as the difference between household income and the estimated average income in the neighborhood. This measure could generally be called as "perceived income inequality" and we contend that this is as valid a measure of income inequality as any other (if not better). The perceived income inequality measure as used in this study has two distinguishing characteristics. First, this measure considers perceived differences, as opposed to the precise differences, in incomes that drives temptations. Second, as opposed to the usual unidirectional impact of income inequality on crime participation[26], we contend that perceived differences in income can have different impacts on temptations, depending on other personal characteristics of the individuals. For instance, some individuals may aspire the sources of income differentials rather than the higher incomes in the neighborhood. For a student, this mechanism translates into aspiring to become a doctor – for example – rather than to steal the wealth of a rich doctor in the neighborhood.

Discrimination and awareness about the criminal justice system scales are similar in nature but items in each scale represent separate dimensions of discrimination. While the ***DS scale*** constitute items that covers discrimination in the general sense (such as, "How often has someone said something insulting to you because of your background"), the ***ACJS scale*** include items that either represent contact with criminals (i.e. have you ever been victim of a crime) or the criminal justice system (i.e. have you ever been arrested by the police). Being a victim of crime generates negative sentiments and may be criminogenic. Being in contact with the CJS – given the nature of the CJS

[26] Income inequality is usually considered as opportunity for greater loot and hence the usual usage of the term is unidirectional.

in Pakistan as detailed in chapter 2 – may also generate negative sentiments and may encourage individuals to pursue their valued goals through illegitimate means.

5.4. Analytical Methodology

Let Y_i be the count of offences committed by the ith individual in the last twelve months. Let X be the $N \times K$ matrix of predictor variables with the ith row $X_i = [x_{i0}, x_{i1}, \ldots\ldots\ldots x_{ik}]$. For all respondents, $x_{i0} = 1$ and for $k > 0$, x_{ik} denote the ith respondents score on one of the $K-1$ predictors. Then the simple linear regression model can be specified as;

$$y_i = \sum_{k=0}^{K} x_{ik}\beta_k + \varepsilon_i \qquad (5.2)$$

Where ε_i is a normally distributed error term with zero mean and constant variance. β_k for k = 0 is the intercept, and for k > 0 is a slope parameter for a predictor. Estimating equation (5.2) with Ordinary Least Square (OLS) is problematic if the dependent variable is count of events. Note that the lower bound of the count of offences is zero. The predicted values of OLS are however continuous (Long, 1997) and hence OLS is possible to yield negative expected values. Moreover, given the skewed distribution of the count of offences in most cases (Lang, 2016), the error term in equation (5.2) is expected to be non-normal, rendering hypothesis testing based on OLS nonsense (Gardner, Mulvey & Shaw, 1995). Overall, the OLS method applied to count data is expected to produce biased, inconsistent and inefficient results (Long, 1997).

Osgood (2000) was amongst the first to utilize Generalized Linear Models (GLM) such as Poisson and Negative Binomial regressions for crime data. The GLMs do not assume normality of the error term and have two attractive characteristics. First, for a dependent count variable having expected (mean) value λ_i, the probability distribution of y_i given λ_i is a member of the exponential family. Second, there is a link function which is some transformation $h(.)$ that linearizes expected value of y_i. That is, $h(\lambda_i) = \varphi_i$, where

$$\varphi i = \sum_k \beta_k x_{ik} \qquad (5.3)$$

is a linear combination of the predictors. For a Poisson regression model, the $h(.) = ln(.)$ and hence $\lambda_i = exp(\varphi_i)$ (Gardner, Mulvey & Shaw, 1995). Given that the underlying counts of offences are random and independent, a Poisson regression model can be specified as;

$$\ln(\lambda_i) = \sum_{k=0}^{K} \beta_k x_k \qquad (5.4)$$

$$P(Y_i = y_i) = \frac{e^{-\lambda_i}\lambda_i^{y_i}}{y_i!} \qquad (5.5)$$

Equation (5.4) is a regression equation connecting the natural logarithm of the mean number of offences for the ith individual to the linear combination of K -1 predictors. Equation (5.5) shows that the possibility of y_i follows the Poisson distribution for the mean count (i.e. λ_i) from equation (5.4). Thus, the expected distribution of crime counts, and corresponding distribution of regression residuals, depends on the fitted mean count, λi (Osgood, 2000).

The Poisson regression model is appropriate to estimate equation (5.4) but if the data generating process is adequately matched by equation (5.5). Equation (5.5) requires that the expected value of y_i equals its variance (i.e. mean = variance = λi) which is possible only if the conventions underlying the Poisson distribution are fully met by the data. One supposition is that λi is the true rate for each case, which infers that the explanatory variables account for all of the significant variation among the aggregate units. If not, the changes between the fitted and true rates will inflate the variance of the residuals (i.e. heteroskedasticity). This assumption is rarely satisfied in real crime data (Osgood, 2000). The mean = variance = λi assumption is also likely to be violated if the count of offences is not independent. In particular, variance is likely to be greater than λi in cases where the occurrence of events is dependent on each other. It is well documented that crime statistics exhibit inertia and one is likely to encounter the violation of mean = variance = λi assumption (Kollias, Mylonidis & Paleologou, 2013). Applying the basic Poisson regression model to such data can create a significant underestimation of standard errors of the β's, which in turn leads to highly unreliable significance tests (Osgood, 2000).

The Negative Binomial Regression (Negbin hereafter), on the other hand, do not require the mean = variance = λi and the independence of counts assumption (Cameron & Trivedi, 2013) and hence produce more reliable results (Kollias, Mylonidis & Paleologou, 2013; Cochran, 2015; Swisher & Dennison, 2016; Yuksek & Solakoglu, 2016). Negbin regression combines the Poisson distribution of event counts with a gamma distribution of the unexplained variation in the underlying or true mean event counts, λi. This combination produces the negative binomial distribution, which replaces the Poisson distribution of Eq. (5.5). The counterpart of equation (5.5) for Negbin is given by;

$$P(Y_i = y_i) = \frac{\Gamma(y_i+\tau)\tau^{\tau}\lambda_i^{y_i}}{y_i!\Gamma(\tau)(\tau+\lambda_i)^{\tau-y_i}} \qquad (5.6)$$

Where Γ is the gamma function and τ is the reciprocal of the residual variance of the underlying mean counts (Gardner, Mulvey & Shaw, 1995).

Although the Negbin model, as compared to other competing regression models, produces reliable results if the count of crimes committed exhibit over-dispersion, contemporary research in the field still use other models as well. For instance, a well-known recent study by Loughran et al., (2016) elected Poisson regression over the Negbin regression model, and Cochrane (2016) reported OLS results despite recognizing the inappropriateness of the method. Still there are others who would prefer logistic regression to model crime data. In line with this convention, this study utilizes Negbin (as the primary and most suitable estimation), Poisson, and OLS regression models.

Chapter 06

Results and Discussion

6.1 Introduction

This chapter is the crux of the thesis. Given that the data has been collected from three different samples, the analysis in this chapter are accordingly presented in three different sections. Section A present analysis of students' data where three different types of crimes (i.e. academic dishonesty, campus crimes and other petty crimes) are studies. In section B, data from the known offenders is analyzed and discussed. In section B, the focus is on violent crimes, property crimes and other petty crimes. Section C outlines analysis of the employee's data where the focus is on white-collar crimes (property crimes), violent crimes and other crimes. Each section follows the procedure of first discussing the nature of the dependent variables and explanatory variables and then presenting and discussing the results.

Section A Student's Sample

The student's sample consists of a total of 457 students. Of these total, 36 percent are from University of Malakand (UOM), 23 percent from University of Swat (UOS), 22 percent from University of Peshawar (UOP) and the remaining 19 percent are from Abdul Wali Khan University Mardan (AWKUM). The total number of students in these universities is 5883, 3069, 13261 and 10156 respectively. Thus, the sample covers 3.39 percent students from UOS, 2.84 percent of the students from UOM, 0.83 percent students from AWKUM and 0.77 percent of the students from UOP. Important descriptive statistics of the students' sample are given in appendix 04 and 05.

A1 Nature of the Dependent Variables

Criminal activity is measured using three different (but associated) measures. Each student was asked to self-report on whether he/she committed 27 different types of crime in the last 12 months. Responses were recorded on a dichotomous scale (yes/no). The responses are coded zero (no involvement in the jth category of crime) or one (when the response was yes with respect to involvement in the jth category of crime). These responses are used to construct the dependent variables as frequency scores and variety scores. In the frequency score dependent variable, responses to all 27 crime categories are added. Variety scores are constructed in similar fashion for separate crime types. For instance, the academic dishonesty dependent variable constituted of

seven types of academic crimes. These are; copying answers from other students during exams, impersonation, getting advance copies of an exam, lying to a teacher about missing an exam, forgery and flattering or bribing a teacher to get good grades.

Table 6.1 Dependent Variables of the Students' Sample

Variable	Items	Type	Variant	Distribution Tests	Dispersion test	Remarks
Self-reported offending (SRO)	27	Frequency Scores	Total	S-W = 0.871*	μ =6.41	Over-dispersion (Negbin)
				K-S =6.08*	σ^2=37.65	
			Standardized	NA	NA	NA
				NA	NA	
Academic Dishonesty related SROs	07	Variety Scores	Total	S-W = 0.836*	μ = 1.76	Over-dispersion (Negbin)
				K-S =2.41*	σ^2 = 3.35	
			Standardized	NA	NA	NA
				NA	NA	
Campus related SROs	07	Variety Scores	Total	S-W = 0.80*	μ = 1.53	Over-dispersion (Negbin)
				K-S = 4.41*	σ^2 = 3.42	
			Standardized	NA	NA	NA
				NA	NA	
SROs for other crime	08	Variety Scores	Total	S-W = 0.88*	μ = 2.23	Over-dispersion (Negbin)
				K-S = 3.82*	σ^2 = 4.68	
			Standardized	NA	NA	NA
				NA	NA	

Note: *S-W stands for Shapiro-Wilk test to test for normal distribution, and K-S stands for Kolmogorov-Smirnov test to test for Poisson distribution. The tests are not performed for mean-centered scores as these either contain fractions or negative numbers which renders Poisson and Negbin inapplicable. The (*) over a value represent statistical significance at 1 percent level.*

The second variety score included seven campus related crimes which can also be classified as property crimes. These crimes are; eating/drinking from a cafeteria without paying the proper

price, using public property illegally, damaging public property, theft of any type and magnitude, swindle, buying or selling stolen goods and using university property (e.g. bus etc.) without paying proper fee. The third variety score, i.e. other crimes, included eight crimes namely; buying, selling or consumption of illegal drugs, holding a weapon without license, graffiti on walls, toilets, or other public places, driving without a license, over speeding, designing and using fake IDs, viewing porn videos, and doing acts parents would not permit. The questionnaire also included 5 violent crimes but are dropped in the analysis due to non-inclusion of violent crimes in any of the deterrence measures used for this sample.

Adding responses in the above fashion to construct frequency scores or variety scores results in a count dependent variable. The distribution of these count dependent variables is checked using the Shapiro-Wilk test (S-W) of normality (Shapiro & Wilk, 1965), and the one sample Kolmogorov-Smirnov test (K-S) to test whether the variable follows Poisson distribution. A significant p-value associated with S-W test (i.e. p-value < 0.05) would imply that the variable is not normally distributed. Similarly, a significant p-value associated with K-S test (i.e. p-value < 0.05) would imply that the variable does not follow the Poisson distribution. Besides these tests, the dispersion of the variable is judged by comparing mean (μ) and variance (σ^2) of the variable. If Variance is greater than the mean, the variable is over-dispersed and vice-versa. If a variable follows Poisson distribution, then its mean equals its variance (equi-dispersion). The results of the distribution and dispersion tests are given in table 6.1 above. It is evident from the table that none of the dependent variable follows normal or Poisson distribution. Instead, all the count variables exhibit over-dispersion and hence Negbin regression is the appropriate estimation technique. However, the analysis that follows also report results of the Poisson regression.

Besides Poisson and Negbin regressions, the study also utilize mean centered (Z-Scores) counterparts of the dependent variables and use these to estimate the Ordinary Least Square (OLS) regressions for checking robustness of the results obtained from the Negbin regression models. As a further robustness check, one could collapse the count dependent variable to form a dichotomous dependent variable in which an individual either reported participation in criminal acts (=1) or otherwise (=0). This last dependent variable would treat an individual committing a single and the maximum number of listed crimes alike and necessarily would waste information and may dilute statistical power (Gardner, Mulvey & Shaw, 1995) of the regression estimates. Hence results of the binary logistic models are not reported in the study.

A2 Measures of the Predictor Variables

The predictor variables used in the regression analysis of the students' sample are listed in table 6.2 and are explained in the previous chapter. Before discussing the reliability and adequacy of each measure for factor analysis, it is imperative to note that all the predictor variables are measured using three different methods[27]. That is, first raw scores (responses) are added and then converted to standard z-scores and are called raw scores mean centered. Second, scores on each item (and in each measure) is first standardized and then added and the resulting scale is named as standardized scales. Both these transformations of the explanatory variables reduce the incidence of multicollinearity in multiple regression (Jaccard, Wan & Turrisi, 1990; Aiken, West & Reno, 1991; Cochran, 2015 and 2016; Svensson, 2015). A third type of measure, which also caters for the incidence of multicollinearity (Jeffers, 1967; Lam et al., 2010), is the "one factor solution" obtained from the principle component analysis.

Table 6.2 Measures of predictor variables

Measure	No. of items	C-Alpha	KMO Test	Bartlett's Test (χ^2 Value)
Perceived Probability of Detection (PPD)	13	0.927	0.935	3525*
Perceived Probability of Legal Sanctions (PPLS)	13	0.906	0.914	2869*
Perceived Severity of Legal Sanctions (PSLS)	13	0.923	0.925	3467*
Perceived Probability of Social Sanctions (PPSS)	13	0.911	0.917	3004*
Perceived Severity of Social Sanctions (PSSS)	13	0.928	0.928	3529*
Perceived Probability of Personal Sanctions (PPPS)	13	0.948	0.939	4677*
Perceived Severity of Personal Sanctions (PSPS)	13	0.928	0.923	3642*
Parenting Scale (PS) [Human Capital-1]	15	0.805	0.820	2274*
School Attachment Scale (SAS) [Human Capital-2]	08	0.872	0.891	1549*
Activity Scale (ACS) [Human Capital-3]	06	0.789	0.821	707*
Time Preference (TP) [Human Capital-4]	04	0.627	0.698	198*
Risk Preference (RP) [Human Capital-5]	03	0.612	0.644	144*
Peer's Behavior (PeeE) [Social Capital-1]	09	0.854	0.873	1488*
Social Capital (SCap) [Social Capital-2]	16	0.709	0.714	1502*
Morality Scale (MS)	30	0.799	0.790	435*
Discrimination Scale (DS)	08	0.845	0.860	1404*
Awareness about Criminal Justice System (ACJS)	05	0.807	0.725	938*
Socio-Economic Status (SES)	19	0.81	0.813	1909*
Parents Education (PE) [Social Capital-3]				
Income Inequality (II)				

Note: *The (*) represent statistical significance at 1 percent level.*

[27] The reported results are however based on factor scores of the explanatory variables. The rest of the results are given in appendix 8, 9 and 10.

Moreover, in line with the classifications used for the dependent variables, the probability measures are separately computed for total self-reported offending, academic dishonesty (AD), campus crimes (CC) and other crimes (OC). The probability measures used for the total self-reported offending are constructed from all 13 items while those for AD, CC and OC are constructed from 3, 6 and 4 items respectively.

Table 6.2 reports the Cronbach's Alpha (Cronbach,1951) which is a widely used measure of reliability. Generally, a value of 0.5 or greater of C-Alpha is considered as a good level of internal consistency for any scale (Thornberry & Krohn, 2000). The table above demonstrates that majority of the measured used in the study achieve C-Alpha values as high as 0.9 and hence are reliable measures of the underlying concepts. Note however that some of the measures originally included more items than those used in the analysis. For instance, the Parenting Scale (PS) which is used as one of the measures of human capital originally contained 18 items but three of the items are deleted in the analysis for improving the C-Alpha value.

Column 4 and 5 in table 6.2 relates to the Principle Component Analysis (PCA) used to construct the one factor scores of the explanatory variables. Before proceeding with the PCA, one must check two important statistics, i.e. the Kaiser-Meyer-Olkin (KMO) statistics and Bartlett's test. The KMO measure is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. The decision rule for proceeding with PCA of a variable is that KMO ≥ 0.5, that is, the value of the statistics should be equal to or greater than 0.5. The Bartlett's test of sphericity is used to justify applicability of PCA to the data sets. It examines the null hypothesis that the variables in the population are uncorrelated. If the computed (χ^2) value of the test is greater than the tabulated value at the chosen level of significance, then we reject the null hypothesis and proceed with the PCA. Table 6.2 demonstrate that all the measures used in the study satisfy both the requirements of the PCA.

A3 Results based on the Students' Sample

Before outlining and discussing the empirical results, a few things needs to be mentioned. First, as Loughran et al. (2016) mentioned, the models estimated in this study are not based on data from natural experiments and hence the results cannot be interpreted as cause and effect relationships. Rather results should be interpreted as associations. Second, although the sign interpretation of the Poisson and Negbin regression coefficients is the same as of OLS (i.e. $\beta_k > 0$ implies a direct

relationship between x_{ik} and y_i, $\beta_k < 0$ implies a negative relationship and $\beta_k = 0$ implies that x_{ik} does not affect the expected value of the dependent variable), the size interpretation of both the models' coefficients is different from the usual OLS interpretation (Gardner, Mulvey & Shaw, 1995). The coefficients of the Poisson and Negbin regression models can be interpreted as percentage change in the expected crime count for a one-unit change in the independent variable, after computing $[\exp(\beta_k x_{ik} - 1]$ (Lang, 2016; Swisher & Dennison, 2016).

According to the distributional analysis of the dependent variables presented in table 6.1, all dependent variables are characterized by over-dispersion. Dispersion of the dependent variable can also be confirmed from the "value/df" value reported under the Poisson regression parameters in table 6.3, or through the dispersion parameter (Disp. P in table 6.3) reported under the Negbin results. A value/df > 1 and Disp. P > 0 implies over-dispersion of the dependent variable and vice versa (value/df = 1 and Disp. P = 0 implies equi-dispersion). Additionally, the Akaike Information Criteria (AIC) and the Bayesian Information Criteria (BIC) would also be used to assess model adequacy and the one with lower AIC and BIC values would be the preferred one. Table 6.3 (and all subsequent results tables) also report the Omnibus test which is used to test the overall significance of the Generalized Linear Models (GLM). The value is reported as LR $\chi 2$ and compares the model with a model including only intercept. A significant p-value associated with LR $\chi 2$ implies that the model fits the data well. Hence, according to the stated criteria and in all the results that follows in this section, the results of the negative binomial regression should be the standard. The results of the Poisson and OLS are reported only as robustness check.

Before discussing the regression results, a word on the implications of ARAM with respect to the sign of different variables. ARAM implies that HC should be negatively associated with criminal participation. Since we have included PS, SAS, ACS, TP, RP, and SES as measures of HC, the impact on criminal participation should not be identical with respect to sign. Four of the HC measures (PS, SAS, ACS and SES) are scaled such that higher values represent good parenting, higher levels of school quality and attachment, more active individual and higher socio-economic status, we expect these four variables to have negative influence on criminal participation. The TP and RP variables are measured such that higher values on the scales represent individuals, respectively, with lower delay of gratification and risk lovers. Both these individual traits are criminogenic, and it is expected that these variables should be positively influencing participation in crime.

As has been mentioned in chapter 05, the study includes three measures of social capital in the analysis; PeeE, SCap and PE. Perceived anti-social behavior of peer's (PeeE) is included in the analysis as primary measure of SC while the two other measures as secondary. Parent's education is measured as a dummy variable where 1 represents that both parents of the respondents are educated and zero otherwise. We expect that the two measures of SC (except PeeE) to have negative impact on participation in illegal activities. Similarly, the setback variables included in the study are DS, ACJS, and II. Considering the construction of the three scales, we expect all the three variables to be positively associated with criminality.

Morality is measured in two ways; i.e. through perceptions of personal guilt because of committing an illegal act and as a more detailed morality scale developed by Bandure et al., (1996). Both these variables are expected to negatively influence crime participation. So is expected with respect to PPD, PPLS, PSLS, PPSS, and PSSS.

A3.1 Total Offending

Criminometric results based on frequency scores (as dependent variable) that contains different varieties of crime are hard to interpret. As convention, estimated regression parameters – when frequency scores of the mentioned type are used – are interpreted as positively/negatively influencing participation in (total) crime. So, convention would be followed to interpret results of regression models having frequency scores as dependent variables.

It is standard that whenever the dependent variable is over-dispersed, a Poisson regression model would overestimate statistical significance of the parameter estimates (due to estimating lower standard errors) as compared to Negbin regression (Kollias, Mylonidis & Paleologou, 2013). The sign of the parameter however is expected to remain the same. This could be true for comparing OLS and Negbin too because one of the problems that emerges from applying OLS on count dependent variable is heteroskedasticity. Heteroskedasticity have the same effect on standard errors estimated from OLS as over-dispersion has in Poisson regression[28]. These expectations are perfectly reflected in the results given in table 6.3. That is, while signs remain the same, some of the variables do not remain statistically significance if one moves from OLS to Poisson to Negbin.

[28] Although it is not certain that standard errors estimated by OLS in the presence of heteroskedasticity are over or underestimations of their BLUE counterparts (Gujarati, 2009)

Table 6.3 Regression Results of Total Self-Reported Offending

Variables	Negative Binomial		Poisson		OLS
	B(p-value)	Exp(B)	B(p-value)	Exp(B)	B(p-value)
(PPD)	-.020 (.702)	.980	.004 (.859)	1.004	.023 (.600)
(PPLS)	-.031 (551)	.980	-.008 (.742)	.992	.001 (.983)
(PSLS)	.132 (.018)	1.141	.128 (.000)	1.136	.126 (.014)
(PPSS)	-.058 (.273)	.943	-.050 (.046)	.951	-.024 (.595)
(PSSS)	.085 (.144)	1.088	.060 (.023)	1.062	.119 (.020)
(PPPS)	-.201 (.000)	.818	-.189 (.000)	.828	-.145 (.001)
(PSPS)	-.260 (.000)	.771	-.226 (.000)	.798	-.231 (.000)
(PS)	.005 (.923)	1.005	.014 (.568)	1.014	-.014 (.748)
(SAS)	-.053 (.718)	1.016	-.087 (.000)	.917	-.093 (.038)
(ACS)	-.263 (.000)	.769	-.244 (.000)	.783	-.213 (.000)
(TP)	.016 (.716)	1.016	.021 (.342)	1.021	.033 (.410)
(RP)	.106 (.020)	1.112	.066 (.004)	1.068	.055 (.191)
(PeeE)	.224 (.000)	.125	.195 (.000)	1.215	.189 (.000)
(SCap)	.060 (.138)	1.062	.043 (.031)	1.044	.078 (.050)
(MS)	.000 (.997)	1.000	-.007 (.742)	.993	.019 (.663)
(DS)	.072 (171)	1.075	.086 (.000)	1.089	.127 (.009)
(ACJS)	.076 (.125)	1.079	.079 (.000)	1.082	.123 (.008)
(SES)	-.084(.079)	.920	-.070 (.003)	.933	-.049 (.267)
(PE)	-.084 (.369)	.919	-.024 (.566)	.976	.003 (.934)
(II)	-.029 (.392)	.971	-.052 (.003)	.949	-.062 (.115)
Intercept	1.693 (.000)	5.436	1.688 (.000)	5.409	
Value/df	1.262		3.818		
AIC	2485.739		3027.446		
BIC	2576.093		3113.693		
LR χ^2	196.537 (.000)		1019.461 (.000)		
Disp. P	.504				

Referring to the results of the Negbin regression in table 6.3, all the sanction variables (except personal sanctions which are discussed subsequently as effects of morality on offending) are either statistically insignificant or assume unexpected signs. That is, PPD, PPLS and PPSS are negative as expected but insignificant. On the other hand, PSLS is statistically significant in all models but is unexpectedly positive. The unexpected results (which are significant) are discussed at the end of this subsection.

Two of the morality measures (i.e. PPPS and PSPS) assume expected signs and are highly significant as well. The morality scale (MS) is however positive in two models and negative in one model but is insignificant in all the three estimated models. Of the HC variables, SAS, ACS, TP and RP assume signs as expected but the PS variable is positive (but very small and insignificant

as well). The primary measure of social capital (i.e. PeeE) is positive and highly significant in all the three estimated models. The SCap as a secondary measure of SC is however positive as well (unexpectedly). Both the setback variables are positive (as expected) but significant only in OLS and Poisson regressions.

Two of the principle variables of the model, i.e. perceived severity of legal sanctions (PSLS) and Income inequality (II), assume unexpected signs. While II is statistically insignificant, the PSLS variable is significant in all the three estimated models. This result, taken at its face value, implies that the more severe sanctions are perceived by the students, the more they are likely to offend. Recall that the question asked from the students in the questionnaire reads as, "suppose your involvement in the following listed acts is detected, and the authorities responsible are committed to inflict the prescribed sanctions upon you, how big a problem would it create for your life". Moreover, the relevant sequence of the criminal thought process starts from the probability of detection (whether the criminal act would be detected or not), followed by probability of punishment (how probable is that the punishment would be inflicted) and the severity of punishment (how severe the punishment will be). Besides individual impacts on the criminal thought process, the three variables are interlinked and a weakening at one place of the process may be observed at the other place. Research has amply shown the weakness of enforcing rules at the academic institutions. For instance, Whitley (1998), Reisig & Bain (2016), and Huang et al., (2015) reported the negligible existence of sanctions at academic institutions. Similarly, Murdock, Beauchamp & Hinton (2008) and Sorgo et al., (2015) have reported that shirking leads university employees to safeguard (rather than discourage) illegal acts at the academic institutions. As a result, severe punishment on paper may not be enough to deter crimes at the academic institutions (as one of the external examiners puts it, punishment might be too severe to be credible). That is, students may perceive punishment associated with different illegal acts at the academic institutions to be severe, but they may also think that the (actual) imposition is very unlikely. That is, students may be perceiving the expected value of external sanctions very low and hence offending ensues. Besides this interpretation, equation (4.9) of ARAM also implies that the sign of the punishment variable could be negative, positive or even null.

A3.2 Academic Dishonesty

There is no doubt that most people, if given a choice, would love to live in societies where compliance with laws and regulations is high. But the irony is that individuals rarely adhere to societal laws and institutional rules even at places where future leaders are trained. It is an unfortunate state of affairs that academic dishonesty in educational institutions is a deep-rooted problem and is increasing day by day (Nazir & Aslam, 2010). According to a 1941 estimate, around 23 percent of the students were involved in academic cheating whose numbers increased to 64 percent in 1964 and 76 percent in 1980 (Kisamore, Stone & Jawahar, 2007). More recent estimates suggest academic dishonesty to be even closer to 100 percent (see for example, Rehman & Waheed, 2004 and Sorgo et al., 2015).

Academic Dishonesty (AD hereafter) is usually considered a very minor crime but it has very serious impacts on the economy. At the very least, academic dishonesty threatens the reputation of honest students, teachers, education system and that of the whole nation (Thomas, 2017). Additionally, students who are involved in academic dishonesty deprive themselves of education and skills that may be critical in the job market (Passow et al., 2006; Reisig & Bain, 2016). Besides lack of critical skills, extant empirical research has proved that dishonest students carry over their dishonesty to the job market (Sorgo et al., 2015; Saana et al., 2016; Lin & Wen, 2007; Sim, 1993; Lawson, 2004). Thus, a dishonest academic environment cannot produce an honest work force which is the most important driver of economic development.

Academic dishonesty or academic cheating is an umbrella term that covers a range of behaviors. Generally, any activity within the academic setting that provides a student with an undue advantage over another is considered as academic dishonesty (Saana et al., 2016). Academic dishonesty is not a new problem and researchers, largely from the Western settings, had long started investigating the sources that facilitates academic dishonesty. These sources can broadly be classified as economic and non-economic causes of academic dishonesty. The economic causes of academic dishonesty include all those cases where involvement in academic dishonesty is induced by some sort of reward, whether it is pecuniary or non-pecuniary. These include; extrinsic motivation (Lang, 2013; Orosz et al., 2013; Thomas, 2017; Rettinger et al., 2004), the pursuit of good grades (Saana et al., 2016), and the negligible existence of sanctions (Whitley, 1998; Reisig, & Bain, 2016; Huang et al., 2016). All these sources effect the cost-benefit calculus of individuals

who choose to engage in academic dishonesty if their net benefits are positive (Becker, 1968). The non-economic causes of academic dishonesty include; fixed mind set (Thomas, 2017), strong peer to peer relations (Sorgo et al., 2015; Rehman & Waheed, 2014), perceptions or moral values (Whitley, 1998; Sorgo et al., 2015; Reisin & Bain, 2016), teachers' ethics (Murdock et al., 2008; Sorgo et al., 2015), work load and higher students-teachers ratios (Rehman & Waheed, 2014; Saana et al., 2016) and a number of other demographic variables such as age and gender (Walker, 2010; Lin & Wen, 2007; Kisamore et al., 2007; Olafson et al., 2013; Hensley et al., 2013).

Table 6.4 Regression Results of Academic Dishonesty

Variables	Negative Binomial		Poisson		OLS
	B	Exp(B)	B	Exp(B)	B(p-value)
(PPD)	-.040 (.414)	.960	-.029 (.513)	.972	-.006 (.884)
(PPLS)	.032 (.505)	1.033	.035 (.427)	1.036	.023 (.601)
(PSLS)	.061 (.267)	1.063	.066 (.191)	1.068	.059 (.242)
(PPSS)	.044 (.386)	1.045	.039 (.389)	1.039	.029 (.527)
(PSSS)	.010 (.838)	1.010	.007 (.879)	1.007	.040 (.405)
(PPPS)	-.193 (.000)	.825	-.194(.000)	.824	-.159 (.001)
(PSPS)	-.135 (.017)	.874	-.127(.012)	.881	-.110 (.034)
(PS)	-.030 (.555)	.971	-.029 (.528)	.971	-.037 (.422)
(SAS)	-.056 (.276)	.945	-.061 (.194)	.941	-.046 (.310)
(ACS)	-.211 (.000)	.810	-.205 (.000)	.815	-.161 (.000)
(TP)	.010 (.840)	1.010	.007 (.867)	.867	.017 (.681)
(RP)	.118 (.014)	1.125	.118 (.007)	1.126	.088 (.040)
(PeeE)	.262 (.000)	1.300	.250 (.000)	1.284	.235 (.000)
(SCap)	.073 (.084)	1.076	.069 (.070)	1.072	.114 (.006)
(MS)	.064 (.163)	1.066	.064 (.124)	1.066	.087 (.044)
(DS)	.018 (.738)	1.018	.023 (.620)	1.024	.063 (.202)
(ACJS)	1.018 (.010)	1.133	.126 (.003)	1.134	.167 (.001)
(SES)	-.074 (.142)	.929	-.076 (.095)	.927	-.050 (.272)
(PE)	-.042 (.645)	.959	-.021 (.790)	.979	.009 (.836)
(II)	-.075 (.045)	.928	-.076 (.015)	.927	-.079 (.051)
Intercept	.396 (.000)	1.486	.392 (.000)	1.480	
Value/df	1.191		1.383		
AIC	1474.771		1479.747		
BIC	1565.223		1566.088		
LR χ^2	185.139 (.000)		293.989 (.000)		
Disp. P	.112				

The results of the AD models are given in table 6.4 above. The results of the previous table are reiterated here in table 6.4. That is, while PPD is negative (but insignificant), the sanction variables are all positive but insignificant. These results are in line with ARAM and previous empirical

research. Recall that the sign of equation (4.9) in chapter 04 is ambiguous and it was stated that; the sign of equation (09) can be negative only if variations in punishment have a negative effect on temptations to offend and positive if punishments have criminogenic effects. The positive sign of the four sanction variables (although insignificant) implies that legal and social sanctions in the academic setting may be criminogenic. This may be true if a student committing AD once lead student to repeat the behavior because of the stigma attached (labelling) to him/her. That is, the teachers may expect the student once detected as dishonest to be dishonest in the future as well and may adjusts grading accordingly. Students being rational may adjust their expectations accordingly and cheating (AD) may be an optimal option in this situation. Thus, the positive signs of the sanction variable in the academic setting makes perfect sense. Both probability and severity of personal sanctions are however negative, as expected, and highly significant as well.

Of the six HC variables, ACS and RP assume expected signs and are statistically significant as well. The sign taken by SES, PS, SAS and RP is also in accordance with the implications of ARAM but are insignificant even at 10 percent level. Two of the three SC variables are also positive and statistically significant. The third social capital variable, i.e. PE is negative but statistically insignificant. We expected PeeE to be positive but SCap and PE to be negative. The sign of SCap is against the expectations but the possibilities of a positive SCap are discussed in chapter 5. Similarly, both the setback variables perform as expected but only ACJS is statistically significant.

The income inequality variable was negative for total offending (results reported in table 6.3) but was insignificant. The variable however turns out to be negative and statistically significant in the AD models. Recall the construction of the income inequality variable. Respondent were asked to report an estimate of the mean income in their neighborhoods as compared to their own. The income inequality measure is then computed as the difference between household income and the estimated average income in the neighborhood. This measure could generally be called as "perceived income inequality" and it is believed that this is as valid a measure of income inequality as any other (if not better). It is not the precise but the perceived difference in incomes that matters for influencing temptations. Also recall that it has been mentioned in chapter 05 that perceived differences in income can have different impacts on temptations, depending on other personal characteristics of the individuals. For instance, some individuals may aspire the sources of income differentials rather than the higher incomes in the neighborhood. For a student, this mechanism translates into aspiring to become a doctor – for example – rather than to steal the wealth of a rich

doctor in the neighborhood. And hence a negative estimated coefficient in the student's sample makes sense.

A3.3 Campus Crimes

Crimes that are used to construct the campus crimes dependent variable include; eating/drinking from a cafeteria without paying the proper price, using public property illegally, damaging public property, theft of any type and magnitude, swindle, buying or selling stolen goods and using university property (e.g. bus etc.) without paying proper fee. The dependent variable when used as count is over-dispersed and hence the results of the negative binomial regression model are standard in table 6.5.

Table 6.5 Regression Results of Participation in Campus Crimes

Variables	Negative Binomial		Poisson		OLS
	B	Exp(B)	B	Exp(B)	B (p-value)
(PPD)	.002 (.979)	1.002	.006 (.901)	1.006	.043 (.352)
(PPLS)	-.057 (.367)	.945	-.046 (.343)	.955	-.039 (-.851)
(PSLS)	.043 (.534)	1.044	.032 (.544)	1.033	.061 (.242)
(PPSS)	-.180 (.007)	.835	-.159 (.001)	.853	-.084 (.069)
(PSSS)	.096 (.196)	1.101	.069 (.192)	1.071	.105 (.053)
(PPPS)	-.204 (.002)	.815	-.175 (.000)	.839	-.109 (.021)
(PSPS)	-.259 (.001)	.772	-.213 (.000)	.808	-.182 (.001)
(PS)	.049 (.432)	1.051	.052 (.291)	1.054	.005 (.909)
(SAS)	-.123 (.066)	.884	-.140 (.005)	.869	-.104 (.025)
(ACS)	-.340 (.000)	.711	-.298 (.000)	.742	-.213 (.000)
(TP)	-.002 (.976)	.998	-.004 (.936)	.996	.023 (.579)
(RP)	.025 (.679)	1.025	.024 (.614)	1.024	.011 (.803)
(PeeE)	.152 (.013)	1.165	.153 (.001)	1.165	.108 (.020)
(SCap)	.077 (.135)	1.081	.070 (.082)	1.072	.099 (.018)
(MS)	.044 (.449)	1.045	.041 (.377)	1.042	.054 (.219)
(DS)	.145 (.026)	1.156	.156 (.001)	1.169	.156 (.002)
(ACJS)	.127 (.035)	1.135	.125 (.005)	1.134	.141 (.004)
(SES)	-.064 (.304)	.938	-.066 (.173)	.936	-.032 (.492)
(PE)	-.075 (.526)	.928	-.049 (.572)	.952	-.007 (.871)
(II)	-.047 (.308)	.954	-.059 (.087)	.943	-.057 (.159)
Intercept	.203 (.002)	1.225	.209 (.000)	1.233	
Value/df	1.149		1.653		
AIC	1418.445		1456.674		
BIC	1508.849		1542.968		
LR χ^2	161.809 (.000)		321.698 (.000)		
Disp. P	0.378				

Results reported in table 6.5 shows that, of the seven sanctions variables, only three are statistically significant. Those are; PPSS, PPPS, and PSPS. That is, all the three variables influence engagement in campus crimes negatively and significantly. Of the HC variables, SAS and ACS re both negative and statistically significant. Similarly, PeeE as a primary measure of social capital and DS and ACJS as measures of setbacks are all positive and significant.

A3.4 Other Crimes

The results of the last model estimated based on the student's sample are reported in table 6.6. The dependent variable in this model include eight crimes; buying, selling or consumption of illegal drugs, holding a weapon without license, graffiti on walls, toilets, or other public places, driving without a license, over speeding, designing and using fake IDs, viewing porn videos, and doing acts parents would not permit. The "other crime" is a mixture of crimes where some crimes are controlled by the police (such as over-speeding and driving without a license), some are within the university authority's domain to control (such as graffiti on walls, toilets and other public places) and some are controlled both by the police and the university authorities (such as using illegal drugs or holding a weapon without a license). There are however crimes that are neither observable by police nor by the university authorities (such as viewing porn movies for example). Thus, given the nature of the dependent variable, one would expect a mixture of results with respect to deterrence variables.

The results displayed are more or less in accordance with the implications of ARAM. That is, of the five sanctions variables, only perceived probability of legal sanctions is negative and statistically significant at five percent level. The perceived severity of legal sanctions is also statistically significant, but its sign is against the expectations. For the first time, we observe that both the morality measures (i.e. the perceived probability and severity of personal sanctions and the morality scale) are negative and statistically significant. This result is expected as many of the crimes included in this model are of private nature where external (i.e. either legal or social) probability of detection is almost negligible. Hence one would expect, in accordance with the implications of ARAM, external sanctions to have very little influence on temptations. Similarly, the results of HC, SC and setbacks variables are standard and according to the implications of ARAM.

Table 6.6 Regression Results of Participation in Other Crimes

Variables	Negative Binomial		Poisson		OLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	.021 (.689)	1.021	.020 (.608)	1.020	.036 (.433)
(PPLS)	-.102 (.038)	.903	-.092 (.017)	.912	-.054 (.235)
(PSLS)	.096 (.080)	1.100	.098 (.022)	1.102	.070 (.182)
(PPSS)	-.065 (.207)	.937	-.063 (.112)	.939	-.028 (.537)
(PSSS)	.080 (.145)	1.083	.076 (.076)	1.079	.116 (.027)
(PPPS)	-.197 (.000)	.821	-.190 (.000)	.827	-.144 (.002)
(PSPS)	-.164 (.003)	.849	-.162 (.000)	.851	-.166 (.001)
(PS)	.042 (.405)	1.042	.056 (.153)	1.057	.038 (.416)
(SAS)	-.062 (.225)	.940	-.075 (.053)	.928	-.063 (.176)
(ACS)	-.234 (.000)	.792	-.234 (.000)	.792	-.200 (.000)
(TP)	.042 (.367)	1.043	.048 (.194)	1.049	.047 (.279)
(RP)	.045 (.340)	1.046	.024 (.514)	1.025	.013 (.774)
(PeeE)	.221 (.000)	1.247	.213 (.000)	1.237	.204 (.000)
(SCap)	.016 (.712)	1.016	.007 (.827)	1.007	.028 (.512)
(MS)	-.083 (.074)	.920	-.094 (.008)	.910	-.076 (.095)
(DS)	.091 (.089)	1.095	.089 (.028)	1.094	.115 (.028)
(ACJS)	.029 (.563)	1.029	.039 (.298)	1.039	.052 (.303)
(SES)	-.039 (.426)	.962	-.036 (.352)	.965	-.032 (.495)
(PE)	-.103 (.282)	.902	-.084 (.247)	.919	-.014 (.752)
(II)	-.034 (.353)	.967	-.049 (.105)	.952	-.050 (.237)
Intercept	.681 (.000)	1.975	.677 (.000)	1.969	
Value/df	1.264		1.790		
AIC	1695.402		1733.449		
BIC	1785.903		1819.836		
LR χ^2	148.417 (.000)		291.415 (.000)		
Disp. P	.263				

Section B Ex-Inmate's Sample

The study aimed to collect data from 500 ex-Inmates but the analysis that follows are based on data obtained from 321 offenders, all of whom are men. The list provided by the Jail superintendents included names of ex-inmates (both sexes) who committed a variety of crimes (from petty theft to murders). Since participation in the study was voluntary, it was very difficult to convince serious criminals for a meager pay of Rs. 400 to participate in the study. Therefore, the sample include only 35 serious criminals (criminals who have committed murders) and the rest are petty thieves, drug addicts and sellers, child sexual abusers, kidnapers, gamblers and the likes. The lists included names of female ex-inmates but were not contacted for participation in the

survey due to social constraints unique to Pashtun society. An effort was made to balance the sample (with respect to gender) by interviewing run away women in the shelter homes but the provincial social welfare department denied access to the shelter homes. The original crimes committed by the ex-inmates or the time spend in jails is however not used in the analysis that follows. Important descriptive statistics based on the ex-inmate's sample are given in appendix 06.

B1 Nature of the Dependent Variables

As opposed to the other two samples (i.e. students and employees), the sample of ex-inmates offered an additional measure of offending (types of crimes committed by the ex-inmates). This potential additional measure of offending could have been created by assigning different weight (in accordance with perceived seriousness of crime committed which can be computed from severity of personal, social and legal sanctions) to different crimes but it would have been essentially subjective. Thus, in line with the other samples, the dependent variables used for the ex-inmate's sample are also self-reported offending in the last 12 months. The questionnaire listed a total of 17 crimes, of which 11 were violent crimes (murder, participated in a fight, ransom/kidnaping, robbery, forcible sex, assault, intimidation, torturing someone, blackmailing/extortion, shot or shot at someone, and domestic violence), 4 property crimes (bribing someone, deceit, theft of any type and value, dealing in stolen goods) and 2 other crimes (buying, selling or consuming illegal drugs, holding an automatic weapon without permit). The sum of the responses to total listed crimes is called the frequency score/total self-reported offending (SRO) while the sum of the three different varieties of crimes are variety scores of violent, property and other crimes respectively.

Distributional information on the four dependent variables of the ex-inmate's sample are given in table 6.7 below. From the results, it is evident that total SRO and SRO for violent crimes dependent variables follows neither normal nor Poisson distribution and are over-dispersed. Hence Negbin is the appropriate modeling technique for these two variables. The null hypothesis of K-S test (i.e. the variable follows Poisson distribution) for SRO of property crimes and other crimes however cannot be rejected at 5 percent level of significance. The mean and variance of these last two dependent variables are also approximately equal and hence the equi-dispersion assumption of the Poisson regression is satisfied. Hence it is appropriate to model SRO related to property and other crimes as Poisson regressions. As in the preceding section, section B also model the dependent

variables using three regression models; Poisson, Negbin and OLS (OLS is applied on the standardized counterparts of the dependent variables).

Table 6.7 Dependent Variables of the Ex-Inmates Sample

Variable	Items	Type	Varian t	Distribution Tests	Dispersion test	Remarks
SRO	17	Frequency Scores	Total	S-W = 0.869*	μ = 3.48	Over-dispersion (Negbin)
				K-S = 3.34*	σ^2 =8.18	
			Standardized	NA	NA	NA
				NA	NA	
SRO (VC)	11	Variety Scores	Total	S-W = 0.824*	μ = 1.65	Over-dispersion (Negbin)
				K-S =1.98*	σ^2 = 3.14	
			Standardized	NA	NA	NA
				NA	NA	
SRO (PC)	04	Variety Scores	Total	S-W = 0.864*	μ = 1.19	Under-dispersion (Piosson)
				K-S = 0.311	σ^2 = 1.16	
			Standardized	NA	NA	NA
				NA	NA	
SRO (OC)	02	Variety Scores	Total	S-W = 0.748*	μ = 0.6	Under-dispersion (Piosson)
				K-S = 0.47	σ^2 = 0.54	
			Standardized	NA	NA	NA
				NA	NA	

Note: *S-W stands for Shapiro-Wilk test to test for normal distribution, and K-S stands for Kolmogorov-Smirnov test to test for Poisson distribution. The tests are not performed for mean-centered scores as these either contain fractions or negative numbers which renders Poisson and Negbin in-applicable. The (*) over a value represent statistical significance at 1 percent level.*

B2 Measures of the Predictor Variables

The predictor variables used in the regression analysis for the sample of ex-inmates are listed in table 6.8. Most of the predictor variables include the same items (and more or less the same number of items) as those in the student's sample analysis. Since the type of offending is different, the probability measures also included different items than the students' sample. In line with the classifications used for the dependent variables in this sample, the probability measures are separately computed for total self-reported offending, violent crimes (VC), property crimes (PC) and other crimes (OC). The probability measures used for the total self-reported offending are

constructed from all 16 items while those for VC, PC and OC are constructed from 11, 03 and 02 items respectively.

Table 6.8 Measures of predictor variables

Measure	No. of items	C-Alpha	KMO Test	Bartlett's Test (χ^2 Value)
Perceived Probability of Detection (PPD)	16	0.861	0.843	1882*
Perceived Probability of Legal Sanctions (PPLS)	16	0.876	0.891	1869*
Perceived Severity of Legal Sanctions (PSLS)	16	0.855	0.852	1691*
Perceived Probability of Social Sanctions (PPSS)	16	0.853	0.882	1574*
Perceived Severity of Social Sanctions (PSSS)	16	0.874	0.865	1909*
Perceived Probability of Personal Sanctions (PPPS)	16	0.923	0.926	2784*
Perceived Severity of Personal Sanctions (PSPS)	16	0.903	0.894	2420*
Parenting Scale (PS) [Human Capital-1]	15	0.692	0.804	1109*
School Attachment Scale (SAS) [Human Capital-2]	08	0.935	0.930	1903*
Activity Scale (ACS) [Human Capital-3]	06	0.576	0.671	158*
Time Preference (TP) [Human Capital-4]	04	0.225	0.544	31*
Risk Preference (RP) [Human Capital-5]	03	0.428	0.578	36*
Peer's Behavior (PeeE) [Social Capital-1]	09	0.860	0.873	1228*
Social Capital (SCap) [Social Capital-2]	16	0.667	0.737	906*
Morality Scale (MS)	25	0.700	0.676	1353*
Discrimination Scale (DS)	08	0.895	0.903	1270*
Awareness about Criminal Justice System (ACJS)	05	0.770	0.733	433*
Socio-Economic Status (SES)	19	0.771	0.776	1578*
Parents Education (PE) [Social Capital-3]				
Income Inequality (II)				

Note: *The (*) represent statistical significance at 1 percent level.*

Table 6.8 reports the basic measurement characteristics of the explanatory variables. The C-Alpha, KMO statistics and Bartlett's Test values are generally well above the acceptable levels for measures other than time preference (TP) and risk preference (RP). The C-Alpha for TP and RP are well below the acceptable level (i.e. 0.5) but are nevertheless used in the analysis that follows. The activity scale (ACS) marginally fulfill the reliability and the PCA requirements but is also used in the subsequent analysis for comparability across samples.

B3 Results based on the Ex-Inmates' Sample

Tables 6.10 to 6.13 report the regression results of the ex-inmate's sample for total offending, violent crimes, property crimes and other crimes respectively. Based on the distributional analysis presented in table 6.7, total offending and violent crimes dependent variables are over-dispersed

while property and other crimes dependent variables are under-dispersed. These dispersion results are confirmed by the "value/df" and "Disp.P" values reported in the table. However, the difference is not much and Poisson and Negbin may perform equally well in modeling the first two dependent variables. This conclusion is also reached when one considers the reported AIC and BIC values in table 6.10 and 6.11. That is, the difference between the corresponding values is not significant. The other two dependent variables (i.e. PC and OC) are under-dispersed. Hilbe (2011) recommends the general Poisson model for under-dispersed count dependent variables. The AIC and BIC values reported in table 6.12 and 6.13 shows that the two values are lower for Poisson regression model than Negbin, and hence Poisson is a better modeling technique for PC and VC.

Before discussing the regression results based on the ex-inmates sample, consider table 6.9 which reported some of the essential descriptive statistics related to the three samples. These descriptive results are based on two questions that were asked from respondents in each sample. The first question asked the respondents regarding their opinion on the number of crimes (in percentage terms) that are reported to the police. The second question asked the respondents about their perceptions on the percent of reported crimes that are cleared by the police. The overall mean of the perceptions of the reported crime is 54 percent while that of clearance is 35 percent only (based on the total of the three sub-samples). Similarly, 62 percent of the total respondents' estimate of the reporting and 85 percent of the clearance is below the overall mean.

Table 6.9 Perceptions of the crimes reported to and cleared by the police (%)

Respondents	% reported to the police		% Cleared by the police		Total
	Below mean	Above mean	Below mean	Above mean	
Students	67	33	86	14	457
Ex-Inmates	51	49	83	17	321
Employees	65	35	85	15	405

The descriptive results based on the sub-samples shows that 67 percent of the students perceive the percentage of the total crimes that are reported to the police is below mean. The corresponding percent of ex-inmates and employees is 51 and 65 respectively. Perceptions regarding clearance rates are however approximately similar. These results imply that, since the perceptions of reported crimes is the greatest amongst ex-inmates, variables that represent legal sanctions should have the greatest impact on temptations of the ex-inmates. Weaker results for the same variables in the

students and employee's samples are partly explained by their lower perceptions of the crimes reported to and cleared by the police.

B3.1 Total Offending

Regression analysis of the ex-inmate's sample retain the same set of explanatory variables except PE, age and MD. PE (i.e. parents' education) is removed from the analysis due to rare events, i.e. majority of the respondent's parents were illiterate. Age and marital status (MD) were not included in the list of explanatory variables in the student's sample due to less variability but are included here. Age is measured in complete years and MD is measured as dummy variable; 1 if the respondent is single and 0 otherwise. Both age and marital status are central variables in desistence theories (e.g. Sampson & Laub, 1993) but are considered here as elements of human and social capital respectively. That is, age is considered (in line with other theories) as an element of human capital that facilitate physical activity which should exert a negative influence on criminality. Similarly, being married implies a deeper connectedness in society and should be negatively associated with criminal engagement (a positive coefficient of MD because 1 implies the individual being single).

Thus, we have a total of 03 legal deterrence variables (PPD, PPLS, PSLS), 02 social sanctions variables (PPSS, PSSS), three measures of personal morality (PPPS, PSPS, MS), 07 measures of human capital (PS, SAS, ACS, TP, RP, SES, Age), 03 measures of social capital (PeeE, SCap, MD) and 03 measures of setbacks (DS, ACJS, II).

Regression results displayed in table 6.10 are standard and according to the implications of ARAM except PSSS, RP, and DS. That is, all the three legal sanctions variables are negative but only PPD is statistically significant at 10 percent level. This outcome is standard as most of the previous research predict probability of detection to have unambiguous negative impact on crime participation while severity of sanction can have both positive or negative impact on crime. Similarly, PPSS is negative and significant at 5 percent level but none of the morality measures, although negative except PSPS, are statistically significant. Of the seven variables related to HC, all signs of the estimated parameters are standard except RP which is discussed at the end of this section. Age, SES and TP all have the expected impact on total offending and are statistically significant. Same is the case with social capital variables. That is, PeeE and MD positively effect

crime participation while SCap is negative but insignificant. Of the setback variables, ACJS and II both positively influence total offending but DS is negative.

Table 6.10 Regression Results of Total Self-Reported Offending

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.076 (.097)	.927	-.073 (.062)	.929	-.155 (.005)
(PPLS)	-.030 (.504)	.970	-.045 (.249)	.956	-.033 (.530)
(PSLS)	-.076 (.261)	.927	-.072 (.210)	.931	.005 (.945)
(PPSS)	-.099 (.031)	.905	-.098 (.012)	.906	-.101 (.073)
(PSSS)	.137 (.030)	1.147	.132 (.014)	1.141	.064 (.317)
(PPPS)	-.004 (.948)	.996	.006 (.900)	1.006	.048 (.412)
(PSPS)	.020 (.702)	1.020	.028 (.522)	1.029	.092 (.138)
(PS)	-.044 (.388)	.957	-.042 (.321)	.959	-.015 (.805)
(SAS)	-.006 (.903)	.994	-.017 (.720)	.984	-.077 (173)
(ACS)	.034 (.443)	.443	.042 (.251)	1.043	.027 (.594)
(TP)	.157 (.000)	1.170	.144 (.000)	1.155	.175 (.001)
(RP)	-.098 (.017)	.907	-.094 (.007)	.910	-.146 (.003)
(PeeE)	.270 (.000)	1.310	.256 (.000)	1.291	-.026 (.610)
(SCap)	-.028 (.500)	.972	-.073 (.062)	.968	.331 (.000)
(MS)	-.015 (.757)	.985	-.020 (.614)	.980	-.024 (.655)
(DS)	-.090 (.088)	.914	-.088 (.051)	.916	-.030 (.603)
(ACJS)	.082 (.089)	1.085	.077 (.057)	1.080	.069 (.205)
(SES)	-.138 (.002)	.871	-.136 (.000)	.873	-.126 (.017)
Age	-.118 (.049)	.888	-.116 (.025)	.891	-.106 (.107)
MD	.213 (.048)	1.237	.202 (.027)	1.223	.260 (.036)
(II)	.082 (.015)	1.086	.083 (.002)	1.087	.107 (.027)
Intercept	1.072 (.000)	2.922	1.083 (.000)	2.954	
Value/df	1.061		1.409		
AIC	1007.302		1018.095		
BIC	1087.164		1094.485		
LR χ^2	131.467		217.508 (.000)		
Disp. P	.090				

B3.2 Violent Crimes

The violent crimes dependent variable of the ex-inmate's sample is constructed from crimes such as murder, participation in a fight, ransom/kidnaping, robbery, forcible sex, assault, intimidation, torturing someone, blackmailing/extortion, shot or shot at someone, and domestic violence. Regression results are appended in table 6.11. Results of all the estimated models (i.e. Negbin, Poisson and OLS) indicate that violent criminals are not all that sensitive to the variables under considerations. That is, the legal sanctions variables are all negative, but no one is significant. Of

the social sanction variables, perceived probability of social sanctions is negative and significant. Personal morality variables are however either insignificant (MS and PPPS) or the estimated parameters assume unexpected signs (PSPS). This result is discussed with other divergent results at the end of this section. In the HC variables, the estimated parameters of only Age and TP are statistically significant. Same is the case with SC variables where only PeeE is significant. Income inequality as one of the setback variables is positive and statistically significant.

Table 6.11 Regression Results of Violent Crimes

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.049 (.473)	.952	-.049 (.397)	.952	-.130 (.028)
(PPLS)	-.049 (.470)	.952	-.069 (.225)	.933	-.035 (.537)
(PSLS)	-.104 (.273)	.901	-.106 (.179)	.900	-.010 (.898)
(PPSS)	-.148 (.033)	.863	-.146 (.013)	.864	-.113 (.060)
(PSSS)	.102 (.260)	1.107	.084 (.277)	1.088	.058 (.390)
(PPPS)	.010 (.906)	1.010	.025 (.721)	1.025	.051 (.404)
(PSPS)	.165 (.045)	1.180	.191 (.009)	1.210	.179 (.009)
(PS)	-.083 (.278)	.920	-.079 (.209)	.924	-.070 (.284)
(SAS)	-.096 (.209)	.908	-.108 (.106)	.897	-.128 (.033)
(ACS)	.083 (.207)	1.086	.092 (.089)	1.097	.056 (.306)
(TP)	.141 (.029)	1.151	.120 (.029)	1.127	.128 (.021)
(RP)	-.044 (.460)	.957	-.044 (.393)	.957	-.074 (.160)
(PeeE)	.299 (.000)	1.348	.277 (.000)	1.319	.297 (.000)
(SCap)	-.015 (.808)	.985	-.018 (.735)	.982	.013 (.815)
(MS)	-.031 (.660)	.970	-.039 (.505)	.962	-.009 (.869)
(DS)	-.050 (.513)	.951	-.050 (.435)	.951	-.004 (.950)
(ACJS)	.070 (.308)	1.073	.068 (.237)	1.071	.044 (.441)
(SES)	-.061 (.339)	.940	-.068 (.216)	.934	-.039 (.480)
(II)	.090 (.059)	1.094	.098 (.008)	1.103	.109 (.035)
Age	-.217 (.015)	.805	-.214 (.005)	.807	-.137 (.051)
MD	.131 (.411)	1.140	.123 (.366)	1.131	.094 (.153)
Intercept	.336 (.001)	1.399	.344 (.000)	1.411	
Value/df	1.224		1.535		
AIC	805.242		813.365		
BIC	885.201		889.847		
LR χ^2	81.412 (.000)		131.515 (.000)		
Disp. P	.180				

B3.3 Property Crimes

The property crimes dependent variable is constructed from four property crimes. These are; bribing someone, deceit, theft of any type and value, dealing in stolen goods. Technically, the results of the Poisson regression model are appropriate but results of the Negbin are identical to Poisson. Thus, it is irrelevant whatever model is mentioned while interpreting the results.

Table 6.12 Regression Results of Property Crimes

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.075 (.229)	.928	-.075 (.229)	.928	-.069 (.212)
(PPLS)	-.049 (.445)	.953	-.049 (.445)	.953	-.091 (.108)
(PSLS)	-.151 (.050)	.860	-.151 (.050)	.860	-.092 (.161)
(PPSS)	-.076 (.236)	.926	-.076 (.236)	.926	-.125 (.029)
(PSSS)	.159 (.036)	1.172	.159 (.036)	1.172	.143 (.027)
(PPPS)	-.029 (.697)	.972	-.029 (.697)	.972	.014 (.814)
(PSPS)	-.072 (.257)	.931	-.072 (.257)	.931	-.071 (.237)
(PS)	-.046(.490)	.955	-.046 (.490)	.955	.020 (.728)
(SAS)	.068(.371)	1.070	.068 (.371)	1.070	.003 (.961)
(ACS)	.026 (.690)	1.026	.026 (.690)	1.026	-.004 (.936)
(TP)	.148 (.019)	1.160	.148 (.019)	1.160	.135 (.014)
(RP)	-.107 (.065)	.898	-.107 (.065)	.898	-.144 (.007)
(PeeE)	.177 (.008)	1.194	.177 (.008)	1.194	.213 (.000
(SCap)	-.035 (.577)	.966	-.035 (.577)	.966	-.065 (.228)
(MS)	.073 (.269)	1.076	.073 (.269)	1.076	.028 (.613)
(DS)	-.109 (.151)	.896	-.109 (.151)	.896	-.031 (.610)
(ACJS)	.087 (.215)	1.091	.087 (.215)	1.091	.062 (.295)
(SES)	-.210 (.001)	.810	-.210 (.001)	.810	-.188 (.001)
(II)	.075 (.138)	1.078	.075 (.138)	1.078	.068 (.176)
Age	-.107 (.219)	.899	-.107 (.219)	.899	-.101 (.154)
MD	.191 (.211)	1.210	.191 (.211)	1.210	.071 (.273)
Intercept	.003 (.976)	1.003	.003 (.976)	1.003	
Value/df	.888		.884		
AIC	651.868		649.868		
BIC	732.114		726.625		
LR χ^2	79.797 (.000)		79.797 (.000)		
Disp. P	6.640				

The results of the property crimes as given in table 6.12 indicates that PPD is negative but insignificant, PPLS is negative but insignificant and PSLS is negative and significant. These results (although insignificant) are in accordance with the implications of ARAM. The negative and significant coefficient of PSLS implies that severity of legal sanctions has a definite negative

influence on property crimes as opposed to violent and total crimes. The social sanctions variables, as before, are either insignificant or has unexpected sign. Same is the case with personal morality where none of the variables are statistically significant. Amongst the HC variables, TP, RP and SES are statistically significant but the estimated coefficient of RP is negative. The SC variables takes the expected signs but only PeeE is significantly different from zero. Income inequality and ACJS are positive and DS is negative, but all these setback variables are insignificant.

B3.4 Other Crimes

The other crimes dependent variable is constructed from two crimes; buying, selling or consuming illegal drugs, and holding an automatic weapon without permit. As with property crimes dependent variable, the other crimes dependent variable is under-dispersed, and the appropriate estimation method is Poisson regression model. Since there are only two crimes, one may think of logistic regression model as an appropriate estimation method. There are however two reasons of not reporting the logistic regression model results. First, buying, selling or consuming illegal drugs is highly correlated with holding an automatic weapon without a permit. This means people having involvement in one type of crime are likely to be involved in the other type as well. Thus, estimating this model by binary logistic (or any other binary model) would necessarily waste information. Second, the results of the binary logistic (available from the author) are not entirely different from Poisson or Negbin.

As in other models, the legal sanctions variables are all negative but only the perceived probability of legal sanctions is statistically different from zero. None of the social sanction variables are significant. Similarly, the personal morality variables are negative (except PSPS) but are statistically insignificant. The performance of the HC variables is likewise mixed. Of the seven HC variables, only TP, SES and RP (with unexpected sign) are significantly different from zero. The SC variables however performs well as both MD and PeeE are positive and statistically significant. Amongst the setback variables, only ACJS is significantly different from zero.

Before closing this section, it is necessary to reflect on the apparently unexpected results. In all the four estimated regression models based on the ex-inmate's sample, the signs of PSSS, RP and DS are against the expectations. The sign of PSSS is understandable as the sign of equation (4.9) in chapter four is ambiguous and can assume both positive and negative sign. Besides the theoretical explanations given in chapter 4 with reference to equation (4.9), a positive PSSS can be justified

in the Pashtun society characterized by long enmities and vengeance (the culture of revenge). It is customary in Pashtun society to blame parties not seeking revenge rather than parties having offended. That is, if party A offends party B, it is a norm in the Pashtun society to blame party B for not seeking vengeance instead of condemning party A. Given this, party B is labeled with various social stigmas (such as coward, womanly, chicken hearted etc.) [Khan, 2017]. To avoid such stigmatization, party B actively seek revenge until it is accomplished. Thus, in such an environment, the negative influence of social sanctions may be weaker than its positive stimulus resulting in a positive coefficient of PSSS.

Table 6.13 Regression Results of Other Crimes

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.008 (.932)	.992	-.008 (.932)	.992	-.078 (.183)
(PPLS)	-.202 (.027)	.817	-.202 (.027)	.817	-.136 (.016)
(PSLS)	-.006 (.953)	.994	-.006 (.953)	.994	.065 (.297)
(PPSS)	-.094 (.283)	.910	-.094 (.283)	.910	-.056 (.330)
(PSSS)	.170 (.102)	1.185	.170 (.102)	1.185	.069 (.264)
(PPPS)	-.154 (.121)	.858	-.154 (.121)	.858	-.079 (.175)
(PSPS)	.050 (.600)	1.051	.050 (.600)	1.051	-.013 (.838)
(PS)	-.004 (.967)	.996	-.004 (.967)	.996	.069 (.243)
(SAS)	.161 (.135)	1.175	.161 (.135)	1.175	.057 (.351)
(ACS)	.054 (.528)	1.056	.054 (.528)	1.056	-.006 (.917)
(TP)	.189 (.027)	1.208	.189 (.027)	1.208	.136 (.136)
(RP)	-.199 (.014)	.820	-.199 (.014)	.820	-.174 (.001)
(PeeE)	.256 (.002)	1.291	.256 (.002)	1.291	.244 (.000)
(SCap)	.019 (.808)	1.019	.019 (.808)	1.019	.011 (.837)
(MS)	-.067 (.480)	.935	-.067 (.480)	.935	-.092 (.107)
(DS)	-.162 (.128)	.850	-.162 (.128)	.850	-.072 (.264)
(ACJS)	.158 (.086)	1.171	.158 (.086)	1.171	.149 (.011)
(SES)	-.159 (.071)	.853	-.159 (.071)	.853	-.123 (.034)
(II)	.058 (.355)	1.060	.058 (.355)	1.060	.058 (.266)
Age	.058 (.612)	1.060	.058 (.612)	1.060	-.013 (.852)
MD	.395 (.059)	1.485	.395 (.059)	1.485	.153 (.021)
Intercept	-.757 (.000)	.469	-.757 (.000)	.469	
Value/df	.839		.835		
AIC	494.885		492.885		
BIC	575.035		569.550		
LR χ^2	56.260 (.000)		56.260 (.000)		
Disp. P	4.613				

Discrimination Scale (DS) is another variable that assumes negative sign (although insignificant in three models and marginally significant in total offending) which is contrary to the implications of the theoretical model. Although may not be convincing, a possible interpretation could be that the feelings of discrimination results in crimes that are not expressive. That is, discrimination is usually directed (or is felt by) towards the marginalized segments of the society. Being marginalized means that such people will seek vengeance from the society but not in an expressive manner. Expressing their intentions clearly could result in further discrimination (or legal sanctions). Being rational individuals, it might be optimal for them to retaliate their discriminatory feelings from the society in the forms of criminal acts that are less detectable. If this is true, then DS can have a negative sign when the dependent variable include crimes that are easily detectable (such as murder).

The third unexpected result is with respect to risk preference. Majority of the economics models of crime suggests that risk affinity is positively associated with offending tendencies. The estimated models based on ex-inmate's sample suggests that RP and offending are negatively associated. This unexpected result could be due to lack of reliability of the scale used (with C-Alpha as low as 0.42). Alternatively, since the ex-inmates are people who recently have experienced legal sanctions, an experience that might have affected their temptations but not risk preferences. It is empirically unknown whether legal sanctions have such impacts, theoretically it is possible that legal sanctions have negative impacts on temptations but leave risk preferences unchanged. If such is the case, then a negative coefficient of RP is perfectly reasonable.

Section C University Employees' Sample

The sample of university employees used in the analyses totals to 405, amongst which 280 (69 percent) are faculty members and 125 (31 percent) are administrative staff. Of the total 405 respondents, 113 (28 percent) are from UOP, 104(26 percent) are from UOM, 116 (29 percent) are from UOS, and 72 (18 percent) are from AWKUM[29]. The total number of employees (Basic pay scale 16 and above) in UOP, UOM, UOS, and AWKUM is 952, 624, 399 and 1001 respectively. Thus, the sample size covers 12 percent of the UOP employees, 29 percent of UOS, 17 percent of

[29] Percentages are rounded upward.

UOM and 7 percent of the total employees of AWKUM. Other relevant descriptive results are given in appendix 07.

C1 Nature of the Dependent Variables

The questionnaire used for university employees (faculty and administration alike) included 21 different crimes. Of the total 21 crimes, 3 crimes related to academic dishonesty (plagiarizing a research paper or other document, falsifying information on a research paper or other document, providing advance copies of an exam to favored students), 13 white-collar (WC) crimes (shirking, misuse of authority, using public property illegally, damaging public property, forgery, theft of any type and value from university, swindle, bribery, embezzlement, fraud/deceit, corruption, pulling sickies and nepotism) and 5 other crimes (buying, selling or using illegal drugs, holding a weapon without permit, moral corruption, bought, received or sold stolen goods and driving without a license). As in the student and ex-inmate's sample, responses to the listed crimes (in the form of yes = 1 and no = 0) are added to form four dependent variables; total SRO, SROs related to AD, SROs related to WC crimes and SROs related to other crimes.

Table 6.14 Dependent Variables of the Employees' Sample

Variable	Items	Type	Variant	Distribution Tests	Dispersion test	Remarks
SRO	21	Frequency Scores	Total	S-W = 0.835*	$\mu = 4.24$	Over-dispersion (Negbin)
				K-S = 5.79*	$\sigma^2 = 21.67$	
			Standardized	NA	NA	NA
				NA	NA	
SRO (AD)	03	Variety Scores	Total	S-W = 0.627*	$\mu = 0.46$	Equi-dispersion (Piosson)
				K-S =1.26	$\sigma^2 = 0.62$	
			Standardized	NA	NA	NA
				NA	NA	
SRO (WC)	13	Variety Scores	Total	S-W = 0.809*	$\mu = 2.75$	Over-dispersion (Negbin)
				K-S = 4.97*	$\sigma^2 = 10.3$	
			Standardized	NA	NA	NA
				NA	NA	
SRO (OC)	05	Variety Scores	Total	S-W = 0.761*	$\mu = 1.04$	Over-dispersion (Negbin)
				K-S = 2.75*	$\sigma^2 = 1.8$	
			Standardized	NA	NA	NA
				NA	NA	

Note: *S-W stands for Shapiro-Wilk test to test for normal distribution, and K-S stands for Kolmogorov-Smirnov test to test for Poisson distribution. The tests are not performed for mean-centered scores as these*

either contain fractions or negative numbers which renders Poisson and Negbin in-applicable. The (*) over a value represent statistical significance at 1 percent level.

The distributional analysis of the four dependent variables are given in table 6.14. The reported test statistics (S-W and K-S) imply that none of the variables, except AD related SROs, follows normal or Poisson distribution and are over-dispersed. The AD SRO however follows the Poisson distribution with the equi-dispersion assumption. Given that other assumptions are satisfied, the appropriate estimation technique for SRO, SRO related to WC and OC is Negbin and for SRO related to AD is Poisson regression.

C2 Measures of the Predictor Variables

The various measures used for explanatory variables are listed in table 6.15. All the probability measures possess excellent internal consistency (as measured by C-Alpha) and satisfy the KMO and Bartlett's tests of sample adequacy. Beside the total probability measures, these are also computed for AD, WC and OC separately. The probability measures associated with AD, WC and OC consists of 3, 7 and 4 items respectively. The rest of the measures of human capital, social capital and setbacks also have good internal consistency and are based on adequate sample for PCA.

Table 6.15 Measures of predictor variables

Measure	No. of items	C-Alpha	KMO Test	Bartlett's Test (χ^2 Value)
Perceived Probability of Detection (PPD)	14	0.944	0.940	3781*
Perceived Probability of Legal Sanctions (PPLS)	14	0.945	0.935	4007*
Perceived Severity of Legal Sanctions (PSLS)	14	0.964	0.957	5343*
Perceived Probability of Social Sanctions (PPSS)	14	0.954	0.944	4491*
Perceived Severity of Social Sanctions (PSSS)	14	0.955	0.948	4714*
Perceived Probability of Personal Sanctions (PPPS)	14	0.964	0.954	5767*
Perceived Severity of Personal Sanctions (PSPS)	14	0.955	0.948	4627*
Parenting Scale (PS) [Human Capital-1]	15	0.850	0.900	2965*
School Attachment Scale (SAS) [Human Capital-2]	08	0.862	0.874	1241*
Activity Scale (ACS) [Human Capital-3]	06	0.842	0.868	873*
Time Preference (TP) [Human Capital-4]	04	0.605	0.688	160*
Risk Preference (RP) [Human Capital-5]	03	0.577	0.627	107*
Peer's Behavior (PeeE) [Social Capital-1]	11	0.875	0.873	1691*
Social Capital (SCap) [Social Capital-2]	16	0.763	0.773	1397*
Morality Scale (MS)	26	0.835	0.840	2822*
Discrimination Scale (DS)	08	0.866	0.890	1335*
Awareness about Criminal Justice System (ACJS)	05	0.848	0.804	878*
Socio-Economic Status (SES)	19	0.810	0.835	1912*

Parents Education (PE) [Social Capital-3]	
Income Inequality (II)	

Note: *The (*) represent statistical significance at 1 percent level.*

C3 Results based on University Employees' Sample

Tables 6.16 to 6.19 report the regression results of the ex-inmate's sample for total offending, academic dishonesty, property crimes and other crimes respectively. Based on the distributional analysis presented in table 6.15, the Negbin results should be the standard for total SROs, SROs related to white-collar crimes and other crimes. The appropriate estimation technique for AD is however Poisson. The rest of the results reported in tables that follows should be looked at as robustness checks. In accordance with the practice adopted in the student's and ex-inmate's samples, any results that violates implications of the theoretical model will be discussed at the end of this section.

C3.1 Total Offending

Table 6.16 below reports the regression results of university employees' sample based on total self-reported offending. The interpretation that follows are based on the Negbin regression. Results obtained from other models (Poisson and OLS) are however identical to the Negbin results.

The set of the predictor variables is retained from the ex-inmate's and students' sample except PE, MD and Age. PE is included only in the analysis based on student's sample, Age only in the ex-inmate's sample and MD in both the analysis based on ex-inmate's and employees' sample but not in students' sample. Education of the respondent is tried as an additional explanatory variable (as measure of HC) but was insignificant (may be due to less variability). PE also was insignificant in all regression estimations based the employees' sample and hence is omitted from the reported results. Thus, the set of explanatory variables include; PPD, PPLS, and PSLS as legal sanctions variables, PPSS and PSSS as extra-legal sanctions variables, PPPS, PSPS and MS as personal sanctions/morality variables, PS, SAS, ACS, TP, RP and SES as variables related to HC, PeeE, SCap and MD as social capital variables, DS, ACJS and II as set-back variables.

Results reported in table 6.16 reveals that the legal sanctions variables perform as per expectations. That is, all the three variables are negative but PPD is insignificant. This implies that PPLS and PSLS are negatively and significantly influencing total offending in the university employees' sample. Likewise, both the social sanctions variables are also significant but PSSS is positive

which is against the theoretical implications of ARAM. Of the three personal sanctions/morality variables, only PSPS is significantly and negatively influencing total offending.

Table 6.16 Regression Results of Total Self-Reported Offending

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.070 (.317)	.932	-.051 (.147)	.950	-.044 (.393)
(PPLS)	-.190 (.003)	.827	-.136 (.000)	.873	-.027 (.583)
(PSLS)	-.225 (.006)	.799	-.193 (.000)	.824	-.056 (.318
(PPSS)	-.123 (.086)	.884	-.164 (.000)	.848	-.111 (.045)
(PSSS)	.137 (.092)	1.147	.150 (.000)	1.162	.069 (.243)
(PPPS)	.019 (.773)	1.020	.005 (.889)	1.005	.055 (.298)
(PSPS)	-.180 (.040)	.835	-.143 (.000)	.867	-.183 (.002)
(PS)	-.078 (.199)	.925	-.022 (.432)	.978	-.029 (.552)
(SAS)	-.137 (.274)	.872	-.128 (.040)	.880	.102 (.031)
(ACS)	.099 (.455)	1.104	.107 (.102)	1.113	-.171 (.096)
(TP)	.126 (.032)	1.135	.120 (.000)	1.127	.158 (.137)
(RP)	-.005 (.937)	.995	.005 (.865)	1.005	.004 (.930)
(PeeE)	.333 (.000)	1.395	.325 (.000)	1.384	.334 (.000)
(SCap)	-.002 (.974)	.998	-.041 (.165)	.959	-.013 (.781)
(MS)	.025 (.668)	1.025	.012 (.696)	1.012	.036 (.453)
(DS)	-.086 (.188)	.918	-.064 (.040)	.938	-.003 (.958)
(ACJS)	.130 (.035)	1.138	.107 (.000)	1.113	.109 (.033)
(SES)	.054 (.387)	1.055	.041 (.177)	1.041	.000 (.995)
MD	.320 (.007)	1.377	.179 (.002)	1.196	.081 (.082)
(II)	.030 (.651)	1.031	.024 (.407)	1.025	.016 (.720)
Intercept	1.101 (.000)	3.007	1.196 (.000)	3.305	
Value/df	1.203		3.675		
AIC	1706.986		2119.142		
BIC	1791.671		2199.977		
LR χ^2	109.416 (.000)		452.46 (.000)		
Disp. P	.696				

Amongst the HC variables, only TP is statistically significant. A positive TP implies that delay of gratification is positively associated with total offending. This result consistently obtains in the other samples as well. The rest of the HC variables (e.g. PS, SAS) takes the expected sign but are insignificant in this model. The social capital variables also perform in line with theoretical expectations. That is, PeeE and MD are both positive while SCap is negative. SCap however is insignificant at any acceptable level. Similarly, the signs taken by the setback variables are also in line with theoretical expectation but only ACJS is found to significantly and positively influencing total offending in the university employees' sample.

C3.2 Academic Dishonesty

Empirical literature on Academic Dishonesty (AD) amongst the students is abundant (for instance see Cochran, 2015 and 2016) but no one knows how big a problem it is amongst the academic staff (Shepherd, 2007). While reviewing the literature, no single research article was found which deals with academic dishonesty amongst the academic staff. The dearth of research on the issue is understandable as getting such information from universities is commercially sensitive and are linked to employment contracts (Shepherd, 2007). In effect, academic dishonesty amongst the university employees is a type of "blue wall of silence" which exists amongst police officers. The "blue wall of silence or blue shield" is an unwritten understanding amongst the police officers regarding not reporting of colleague's errors and crimes. The report by Shepherd (2007) signify the fact that academic dishonesty amongst academic staff exists but the dearth of research on the issue is nothing else but a blue shield.

To the best of my knowledge, this study is the first research effort which uncovers academic dishonesty amongst academic staff in Pakistan. For doing this, the study considers three crimes related to academic dishonesty amongst the university academic staff. These crimes are; plagiarizing a research paper or other document, falsifying information on a research paper or other document, and providing advance copies of an exam to favored students. The descriptive findings of the prevalence of AD amongst universities academic staff are reported in table 6.17 below. The second column of the table demonstrate the percent of respondents who self-reported AD positively in the sample. The third column corresponds to the questions asked regarding other people's involvement in a particular act of AD. The results show that AD is a problem of considerable magnitude amongst the academic staff in Pakistani universities. This however can be considered the lower bound of the problem as the sample constitute (mostly) academic staff who have less research experience as compared to those who are not part of the sample.

Table 6.17 Prevalence of AD amongst universities academic staff

Types of AD	Self-Reported Offending (%)	BTS (Mean)
Plagiarism	14.6	30.42
Falsifying information	16.8	33.52
Advance copies of exams	14.3	27.10

The Higher Education Commission (HEC) is responsible for controlling AD amongst the university employees and issue guidelines from time to time. If a teacher/researcher is found guilty

(by the plagiarism standing committee of HEC), then there are three types of punishment prescribed in the guidelines. These are; major penalties (such as dismissal from service and black listing), moderate penalties (such as demotion to the next lower grade and blacklisting) and minor penalties (such as warning, freezing of research grants and annual increments). The HEC is however a reactive agency where someone must report the incidence of AD. The reporting procedure is also complex and complete information of the person complaining is mandatory for initiating actions against an offender. Resultantly, the blue shield of silence is further strengthened by the complexity of the procedures and by the absence of anonymity in reporting. In turn, the legal sanctions variables are less likely to influence engagement in academic dishonesty amongst the university employees.

Table 6.18 Regression Results of Academic Dishonesty

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.080 (.395)	.923	-.079 (.397)	.924	-.032 (.533)
(PPLS)	-.012 (.904)	.989	-.010 (.920)	.991	.027 (.605)
(PSLS)	-.117 (.293)	.890	-.117 (.285)	.889	-.045 (.444)
(PPSS)	-.127 (.228)	.881	-.127 (.222)	.881	-.064 (.273)
(PSSS)	.158 (.176)	1.171	.157 (.175)	1.170	.075 (.230)
(PPPS)	.032 (.756)	1.032	.030 (.762)	1.031	.029 (.590)
(PSPS)	-.089 (.437)	.915	-.413 (.023)	.662	-.079 (.199)
(PS)	-.175 (.027)	.839	-.173 (.026)	.841	-.108 (.034)
(SAS)	-.413 (.025)	.661	-.413 (.023)	.662	-.218 (.043)
(ACS)	.270 (.160)	1.309	.270 (.156)	1.309	.093 (.397)
(TP)	.245 (.006)	1.277	.247 (.005)	1.280	.126 (.012)
(RP)	-.102 (.270)	.903	-.103 (.262)	.902	-.043 (.399)
(PeeE)	.209 (.014)	1.232	.207 (.014)	1.230	.133 (.010)
(SCap)	-.157 (.085)	.855	-.156 (.083)	.856	-.046 (.346)
(MS)	-.046 (.578)	.955	-.047 (.564)	.954	-.041 (.422)
(DS)	-.025 (.796)	.975	-.023 (.808)	.977	-.042 (.427)
(ACJS)	.127 (.165)	1.136	.126 (.168)	1.134	.077 (.149)
(SES)	.083 (.365)	1.087	.083 (.362)	1.086	.079 (.110)
(II)	-.068 (.411)	.934	-.068 (.408)	.934	-.051 (.290)
MD	.842 (.000)	2.320	.837 (.000)	2.309	.190 (.000)
Intercept	-1.455 (.000)	.233	-1.452 (.000)	.234	
Value/df	.998		1.009		
AIC	614.903		613.402		
BIC	699.588		694.238		
LR χ^2	67.862 (.000)		91.862 (.000)		
Disp. P	.025				

Empirical results based on the estimated models on AD amongst the university employees are reported in table 6.18. Based on the distributional results of the dependent variables, the AD dependent variable follows a Poisson distribution and hence the results of the Poisson regression are interpreted. The results of the Negbin regression are also identical to the Poisson results. Table 6.18 shows that, although negative, none of the legal sanction variables (PPD, PPLS and PSLS) are statistically significant. This reiterates skepticism of the effectiveness of the HEC anti-plagiarism policy which is ineffective in controlling AD. The social sanctions variables are also completely redundant in controlling AD among the university teachers and researchers. This however is also understandable given that involvement is less likely to be reported and the social stigma associated with AD depends on the reporting in the first place.

Personal sanctions/morality however does have a deterrence effect on AD as PSPS is negative and statistically significant. Same is the case with HC and SC variables which does have an influence on AD. For instance, both PS and SAS are negatively and significantly associated with AD and TP predicts AD positively. All the three measures of the SC are significant with expected signs. That is, perceived behavior of peer's and being single are positively associated with AD while SCap is negatively influencing AD. None of the setback variables are however significant predictors of AD amongst the university employees. In fact, two of the setback variables (DS and II) are negative which are exactly in accordance of the theoretical implications of the model. That is, employees having feelings of discrimination are less likely to engage in AD because the blue shield is expected to be very weaker for them (perceived threat of another more severe discrimination).

C3.3 White-Collar Crimes

Compared to property and violent crimes, empirical research on white-collar crimes remains relatively uncharted territory in large part because of the lack of available data sources (Piquero & Benson, 2004; Piquero, Piquero & Weisburd, 2016). Interest in white-collar crime has not been lacking in criminology, but sustained empirical research has. Early criminological research on white-collar crime and criminals was largely descriptive, qualitative, and case study–based e.g. see Waring & Bode, 1988). Empirical research done on white collar crimes include; how rational choice (Paternoster & Simpson, 1996; Simpson, 2002), neutralization (Piquero, Tibbetts & Blankenship, 2005; Vieraitis et al., 2012), and other individual-difference traits such as self-control

(Holtfreter et al., 2010; Simpson & Piquero, 2002), desire for control (Piquero, Exum & Simpson, 2005; Piquero, Schoepfer & Langton, 2010; Schoepfer, Piquero & Langton, 2014), and fear of falling (Piquero, 2012) influence decisions to commit white collar crimes. More recent empirical research on white-collar crimes include Piquero, Piquero & Weisburd (2016) and Pickett, Loughran & Bushway (2016).

Table 6.19 Regression Results of White-Collar Crimes

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.024 (.751)	.976	.005 (.914)	1.005	.013 (.796)
(PPLS)	-.197 (.003)	.821	-.142 (.000)	.868	-.055 (.252)
(PSLS)	-.208 (.015)	.812	-.214 (.000)	.807	-.063 (.259)
(PPSS)	-.140 (.060)	.869	-.166 (.000)	.847	-.107 (.044)
(PSSS)	.139 (.108)	1.150	.145 (.002)	1.156	.052 (.375)
(PPPS)	.000 (.994)	1.000	-.006 (.880)	.994	.052 (.328)
(PSPS)	-.183 (.042)	.833	-.125 (.007)	.883	-.156 (.009)
(PS)	-.044 (.506)	.957	.008 (.828)	1.008	-.014 (.779)
(SAS)	-.085 (.531)	.919	-.070 (.369)	.933	-.128 (.213)
(ACS)	.042 (.771)	1.043	.049 (.543)	1.051	.114 (.286)
(TP)	.101 (.111)	1.107	.002 (.002)	1.119	.096 (.045)
(RP)	.003 (.968)	1.003	-.002 (.965)	.998	-.005 (.912)
(PeeE)	.390 (.000)	1.477	.368 (.000)	1.444	.347 (.000)
(SCap)	.016 (.810)	1.017	-.030 (.417)	.971	-.002 (.963)
(MS)	.008 (.902)	1.008	-.008 (.826)	.992	.024 (.620)
(DS)	-.084 (.230)	.920	-.052 (.178)	.949	.025 (.622)
(ACJS)	.118 (.077)	1.125	.091 (.014)	1.095	.094 (.067)
(SES)	.054 (.423)	1.055	.048 (.199)	1.049	.000 (.991)
(II)	.056 (.441)	1.057	.047 (.214)	1.048	.032 (.486)
MD	.338 (.008)	1.402	.193 (.006)	1.213	.097 (.039)
Intercept	.652 (.000)	1.920	.748 (.000)	2.112	
Value/df	1.171		2.774		
AIC	1452.258		1670.566		
BIC	1536.943		1751.402		
LR χ^2	102.805 (.000)		324.136 (.000)		
Disp. P	0.743				

The white-collar crime dependent variable in this study is constructed from 13 white-collar crimes. These crimes are; shirking, misuse of authority, using public property illegally, damaging public property, forgery, theft of any type and value from university, swindle, bribery, embezzlement, fraud/deceit, corruption, pulling sickies and nepotism. The dependent variable is over-dispersed and hence the results of the Negbin regression model are valid as compared to other reported

models. Before highlighting the key results obtained with respect to white-collar crimes, it is important to note the recent findings of Schoepfer, Carmichael & Piquero (2007). These authors reported that more education and higher incomes are associated with lower perceptions of arrest risks resulting from white-collar crimes. Since more educated and people from higher socio-economic backgrounds are more likely to be able to commit white-collar crimes, the results of Schoepfer et al., (2007) implies that white-collar criminals are less deterred by legal sanctions than the rest of the criminals.

In sharp contrast to Schoepfer, Carmichael & Piquero (2007) and in accordance with the implications of the theoretical model of this study, it is found that legal sanctions threats are the most important variables deterring white-collar crimes. Results given in table 6.19 shows that PPD, PPLS and PSLS all are negative and two are statistically significant as well. Perceived probability of social sanctions is also negative and significant which implies that threat of social sanctions is also important in deterring university employees from white-collar crimes. Similarly, perceived severity of personal sanctions (as measure of morality) is also negative and significant. While none of the human capital measures are statistically significant, PeeE and MD as measures of social capital are both significant and according to the theoretical expectations. Similarly, only one of the setback variables (ACJS) achieves statistical significance while the rest are insignificant.

C3.4 Other Crimes

The "other crimes" dependent variable is constructed from 5 crimes. These are; buying, selling or using illegal drugs, holding a weapon without permit, moral corruption, bought, received or sold stolen goods and driving without a license. The crimes are diverse in nature. For example, there is practically very less probability that moral corruption would be detected - and if detected – who would punish the offender? The rest of the crimes included in this category are either less serious and may not be considered worthy of action by the public authorities (such as driving without a license[30]), or the probability of university employees' involvement is near zero (such as dealing in drugs). As a result, these other crimes are either considered normal activities (holding a weapon without a license and driving without a license for example) in areas under study or are committed

[30] This must be true as two of the universities which constitute bulk of the sample are UOM and UOS. UOM is constituted in Dir and UOS in Swat, where vehicles are not registered. In principle, driving an unregistered vehicle must be a serious crime than driving without a license. In turn, authorities not minding driving an unregistered vehicle should not mind driving without a license.

less frequently by university employees. Hence the empirical results may or may not be in accordance with the theoretical expectations. But this does not reduce the viability of the model as, by definition, the dependent variable is either considered a normal activity (and hence deterrence is irrelevant) or the respondents are less likely to engage in the listed activities.

Table 6.20 Regression Results of Other Crimes

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.020 (.807)	.980	-.010 (.884)	.990	-.049 (.367)
(PPLS)	-.203 (.011)	.816	-.192 (.002)	.826	-.038 (.465)
(PSLS)	-.232 (.007)	.793	-.220 (.001)	.802	-.032 (.582)
(PPSS)	-.110 (.224)	.896	-.119 (.119)	.887	-.113 (.055)
(PSSS)	.058 (.529)	1.059	.073 (.322)	1.076	.066 (.272)
(PPPS)	-.081 (.310)	.922	-.098 (.128)	.907	-.012 (.833)
(PSPS)	-.094 (.310)	.910	-.095 (.195)	.910	-.180 (.003)
(PS)	-.095 (.190)	.910	-.081 (.151)	.922	-.027 (.605)
(SAS)	-.084 (.590)	.920	-.094 (.468)	.910	-.094 (.392)
(ACS)	.169 (.296)	1.185	.166 (.226)	1.181	.168 (.139)
(TP)	.091 (.218)	1.095	.066 (.280)	1.069	.061 (.227)
(RP)	.091 (.236)	1.095	.116 (.064)	1.123	.063 (.235)
(PeeE)	.204 (.008)	1.226	.210 (.001)	1.233	.216 (.000)
(SCap)	-.014 (.849)	.986	-.023 (.711)	.977	-.004 (.940)
(MS)	.068 (.395)	1.071	.072 (.282)	1.074	.066 (.204)
(DS)	-.085 (.283)	.918	-.097 (.128)	.908	-.024 (.656)
(ACJS)	.109 (.139)	1.115	.118 (.046)	1.125	.093 (.086)
(SES)	.021 (.772)	1.021	.000 (.996)	1.000	-.046 (.352)
(II)	.031 (.666)	1.032	.040 (.463)	1.041	.013 (.797)
MD	-.087 (.542)	.917	-.120 (.302)	.887	-.056 (.265)
Intercept	-.093 (.350)	.911	-.077 (.351)	.926	
Value/df	1.122		1.509		
AIC	955.002		972.331		
BIC	1039.687		1053.166		
LR χ^2	73.864 (.000)		88.974 (.000)		
Disp. P	.427				

The results of the models having "other crimes" as dependent variable are appended in table 6.20 above. As expected, only PPLS, PSLS and PeeE are statistically significant predictors of the other crimes category in the sample of university employees. The legal deterrence variables may be significant due to the inclusion of dealing in drugs and in stolen goods which are considered criminal acts. The significance of the PeeE implies that having a social circle conducive to the type of acts considered in this model increases the probability of offending for the respondent.

Chapter 07

Conclusions, Recommendations and Limitations

The applications of the basic principles of economics to the study of crime dates back to Bentham (1747-1832) and Beccaria (1738-1794). According to these philosophers, criminal behavior is the output of rational calculation based on costs and benefits associated with the criminal act. Individuals, according to these philosophers, are likely to commit crime(s) if the perceived benefits outweigh the perceived costs of crime (Barlow & Kauzlarich, 2010). These basic ideas were formalized and popularized by Becker (1968) and were further elaborated by Sandmo (1972), Ehrlich (1973), Kolm (1973), Singh (1973), Block & Heineke (1975), Heineke (1978), Witte (1980) and more recently by Nagin, Solow & Lum (2015). The central message of all these models is that probability of detection and severity of punishments are inversely related with crime participation.

Since Becker's (1968) seminal work, theoretical and empirical literature on the economics of crime is growing by leaps and bounds and has assumed the importance of a separate discipline in modern times. The assumptions and the central message of the model(s) are however severely criticized by the sociologists trained criminologists. For instance, it is said that the economics models of crime predominantly assume homogenous population while heterogeneity is the most appropriate starting point to study crime. Similarly, the centrality of the criminal justice variables in the economics models of crimes is being criticized for shadowing more proximate personal, social and environmental factors. Besides such theoretical objections, inadequacies and shortcomings of the empirical research based on the economics model of crime are realized even by the hardest proponents of the rational actor models. For example, it has long been recognized that the models are based on individual's choices, but empirical studies use aggregate published data to estimate parameters of the theoretical constructs. Resultantly, the empirical proxies used for the theoretical constructs of the model(s) are inadequate.

The present study is designed to address some of the theoretical objections and empirical inadequacies in the economics (rational actor) model of crime. To this end, the rational actor model is first augmented with human and social capital, individual's morality and opportunities/setbacks. The resulting model is named Augmented Rational Actor Model (ARAM) and its implications are then tested with using individual level data. The data is obtained from three distinct samples

namely; students, employees and ex-inmates. The idea of testing the implications of ARAM using data from three different samples and a variety of criminal acts (ranging from crimes as minor as cheating during exams to majors as killing someone) was to address one of the long-standing criticisms of the rational actor model. That is, historically, the rational actor model is labelled as a model that can explain, at best, property crimes but no other crimes.

The study utilizes various transformations (such as z-scores and factor scores) of the dependent and explanatory variables before estimating various regression models. Each dependent variable (in level and z-scores form) is regressed on the set of explanatory variables (converted to z-scores or factor scores) using Poisson, Negative Binomial and Ordinary Least Squares methods. Results based on factor scores (of explanatory variables) are presented and discussed in the previous chapter and the rest are appended in the appendix section. The entire empirical results are generally in line with the theoretical implications of the augmented model. That is, it is found that human capital, social capital, morality, the structure of opportunities and setbacks and the criminal justice system variables are all important in explaining crime. However, the results are not universal, and it is found that the explanatory power of different variables changes from sample to sample and crime to crime.

7.1 Conclusions

Before concluding the thesis, it is imperative to discuss the summary results obtained from the empirical tests. The results obtained in the previous chapter are summarized in table 7.1 and are briefly discussed subsequently. As in the previous chapter, the results obtained from each sub-sample are concluded separately, starting from the students' sample.

From the regression analysis of the student's sample, we observed that personal morality as measured by PPPS and PSPS are consistently and negatively influencing total offending (table 6.3), academic dishonesty (table 6.4), campus crimes (table 6.5) and other crimes (table 6.6). The other consistent results include the negative influence of being active (ACS) and the positive influence of negative social capital (PeeE) on total offending, academic dishonesty, campus crimes and other crimes. Perceived probability of detection, perceived severity of legal and social sanction, although negative in most cases, are consistently insignificant which implies that offences specific to students are not influenced by legal and social sanctions. PPLS is negatively and significantly associated with other crimes but has no influence on total offending, campus

crimes and academic dishonesty. Likewise, PPSS reduces the probability of engaging in campus crimes but has no impact on other categories of crimes considered in the sample.

Table 7.1 Summary of the results

	Crimes						
Variables	Total Offending	Academic Dishonesty	Campus Crimes	White-Collar Crimes	Violent Crimes	Property Crimes	Other Crimes
PPD	33.33	---	---	---	---	---	---
PPLS	33.33	---	---	100	---	---	100.00
PSLS	33.33	---	---	100	---	100	33.33
PPSS	66.67	---	100	100	100	---	---
PSSS		---	---	---	---	---	---
PPPS	33.33	50	100	---	---	---	33.33
PSPS	66.67	50	100	100	---	---	33.33
MS	---	---	---	---	---	---	33.33
PS	---	50	---	---	---	---	---
SAS	---	50	100	---	---	---	---
ACS	33.33	50	100	---	---	---	33.33
TP	66.67	50	---	---	100	100	33.33
RP	33.33	50	---	---	---	---	---
SES	66.67	---	---	---	---	100	33.33
Age	50.00	---	---	---	100	---	---
PeeE	100.00	50	100	100	100	100	100.00
SCap	---	50	---	---	---	---	---
PE	---	---	---	---	---	---	---
MD	100.00	100	---	100	---	---	50.00
DS	---	---	100	---	---	---	33.33
ACJS	66.67	50	100	100	---	---	33.33
II	33.33	---	---	---	100	100	---

Note: *The values represent percent of the times a variable is estimated with correct sign and statistical significance. The empty cells correspond to variables that are insignificant in all the estimated models.*

Besides, morality scale (MS) is negatively associated with other crimes but not with AD, CC or total offending. SAS influences CC negatively but have no influence on the rest of the categories. Risk preference is positively affecting the probability of engaging in total offending and AD but is insignificant in models having campus and other crimes as dependent variables. SES have a significant negative impact on total offending (which also include violent crimes) but not on varieties of crimes. Discrimination scales of DS and ACJS are affecting variety scores as expected

but are insignificant predictors of total offending. Human capital measures of PS and TP and social capital measures of SCap and PE are insignificant in all the estimated models based on the student's sample.

The regression analysis based on ex-inmate's sample reveals that time preference, socio-economic status and perceived antisocial behavior of the peers are strong and consistent correlates of all types and total offending. While TP and PeeE are positively influencing offending in the ex-inmate's sample, SES is consistently and negatively associated with offending. Besides these consistent results, the analysis also show that legal and social sanctions also have a role in predicting criminal behavior. For example, it was found that PPD, PPLS, and PSLS have a negative influence on total offending, other crimes and property crimes respectively. Violent crimes are however affected by PPSS but not by legal sanctions. Moreover, Age is found to be negatively correlated with total offending and violent crimes. Marital status and ACJS also influences total offending and other crimes but not violent and property crimes. Income inequality was however found to influence violent crimes and total offending amongst the ex-inmates.

Apart from the above stated findings, the study failed to find statistical evidence with respect to the effects of personal morality (PPPS, PSPS, and MS are all either insignificant or occasionally have assumed counterintuitive signs) on offending. Similarly, majority of the human capital variables (such as PS, SAS, ACS and RP) are also insignificant in the regression analysis.

The analysis of the university employees sample also revealed interesting and important findings. The focus of analysis of the university employees' sample was AD and white-collar crimes but some other minor crimes were also included in the list. The regression results obtained from this sample revealed that perceptions of legal sanctions are the most significant predictors of total offending, white-collar and other crimes. These perceptions are however irrelevant when one considers crimes related to AD. Personal sanctions/morality is also a significant inhibitor of total offending and white-collar crimes but not of AD.

The most important predictors of AD in the sample of university employees turned out to be the HC and the SC variables. That is, AD is negatively influenced by PS, SAS and SCap but positively by TP, PeeE and MD. While none of the HC variables explained variations in white-collar offending, SC is one of the important predictors of the white-collar crimes in the sample of university employees. The setback variables (i.e. ACJS) occasionally was found to be a significant

predictor of the crimes considered for the sample of university employees but has no meaningful theoretical association with the focused crimes (i.e. AD and white-collar crimes) in this sample.

7.2 Policy implications

With respect to policy implications, the results of the current study imply that various crimes are differentially deterred by the set of variables under consideration. In turn, this implies that a one-size-fits-all approach of punishment may not be the appropriate solution for controlling variety of crimes in the country. Rather and besides a generic policy, policy options should also be tailored that closely relates to the type of offenders and crimes. Having said that, the following paragraph highlights some of the policy implications that can be pinned down based on the findings of the study.

Based on the results obtained from the student's sample, several policy recommendations can be suggested. For instance, it was consistently demonstrated that personal morality is the strongest deterrence to the crimes considered in the student's sample. Thus, it follows that focusing on moral education of students can help eliminate criminal tendencies amongst the students in academic institutions. A second recommendation that follows from these results is the consistent negative influence of being active on offending. It calls for policies in academic intuitions which promote activity and discourage laziness amongst the students. Third, it is being found that having delinquent friends encourage participations in criminal activities. In effect, a delinquent student is like a spiral who spreads his/her criminal nature amongst the rest of the students. It calls for zero tolerance policies on criminal/delinquent tendencies suspected in any one student.

Unfortunately, the findings in this study suggests that deterrence variables have very limited role in eliminating criminal tendencies from students which renders, apparently, zero tolerance policies less effective. However, as noted in chapter 6 section A3.1, the insignificance of the legal deterrence variables may imply the non-existence of legal punishment in academic institutions (e.g. see Whitley, 1998; Reising & Bain, 2016 and Huang et al., 2016). If such is the case, then zero tolerance policies based on punishments in true spirit may be very helpful in eliminating criminal tendencies from students. Besides these, discrimination is also found to be positively associated with generating criminal tendencies amongst students. Thus, academic institutions should make sure that each individual student is treated on merit and discrimination of any type

(based on gender, race, ethnicity, area of belonging, religious beliefs and disability) and in any capacity, is strongly discouraged.

The policy implications that emerges from the analysis of the ex-inmate's sample are largely similar to those obtained from student's sample. There are however some additional insights that are relevant to the specific nature of the crimes committed by the ex-inmates. For example, time preference has been consistently found to be a significant correlate of offending across samples. In other words, people who cannot delay their gratification are more likely to pursue their valued goals through short cuts and illegal means. Having established that, Merton's (1938) assertion that an imbalance between goals and means results in crimes seems very realistic. That is, crimes ensue when goals assume much more importance in comparison to how goals are achieved. This calls for a dire need to recover the complex balance between means and goals. The balance between goals and means is complex because there is no single and simple way to recover this balance. For instance, consider property and white-collar crimes. The goal behind adopting illegal means (such as property/white-collar crimes) may be assuming or maintaining a good socio-economic status. In such a case, the balance could be recovered in two interdependent ways. First, educating people regarding the desirability of achieving goals through legal means (social deterrence). Second, decreasing the attractiveness of the shortcuts and illegal means by way of legal sanctions.

TP being consistently positively associated with total offending, violent crimes, property crimes and other crimes in the ex-inmate's sample implies that the case pendency in the courts of Pakistan (as observed in chapter two) may be criminogenic. That is, if people are characterized by lower delay of gratification, then they cannot wait for achieving their valued goals (justice in this case). Given that the case pendency in the court system of Pakistan is increasing each year, one could expect (given TP) people increasingly adopting other alternative (criminal in most cases) ways of satisfying themselves. In this case, the imbalance of goals and means calls for the provision of speedy justice.

Besides TP, the study finds that age is negatively associated with total offending and violent crimes in the sample of ex-inmates. And as is shown in figure 2.12 of chapter 2, a good majority of the total population of Pakistan will be in their teens in the near future. Lin (2012) has recently informed the developing world that the youth bulge brings with itself a promise of prosperity and a genuine threat of social disorder. Similarly, a much-cited article of Hirschi & Gottfredson (1983)

states that, "Age is everywhere correlated with crime" and that this association do not depend on economic status, marital status, race, or sex. Thus, the future trends of crime in Pakistan very much depends on how the energies of the youth are utilized. In the absence of proper channelization, crimes in Pakistan are expected to increase with the youth bulge. Resultantly, both the work load of judiciary and overcrowding in prison facilities are expected to increase even further. To deal with the ever-mounting court cases, the government should either increase the capacity of the lower courts or should invest in alternative forms of dispute resolution[31]. To deal with the overcrowding of prison facilities, the Government should consider alternative forms of punishment[32]. These alternative forms of dispute resolutions and punishment, if successful, seems attractive which can potentially reduce the burden on the public exchequer as well.

Similarly, the socio-economic status of the ex-inmates were found to be negatively associated with offending in the ex-inmate's sample. The variable has been included in the analysis as one of the measures of human capital but given that income inequality also influences offending, these results calls for policies which guarantees a minimum standard of living for the people in the marginalized areas.

The policy implications obtainable from the results of the university employees' sample largely resembles those obtained from earlier samples and needs no repetition. There are however distinct policy implications which relates to AD and white-collar crimes. For instance, it was found that perceptions of legal sanctions effects total offending, white-collar and other crimes but not AD. This finding essentially means the weaker implementation of the HEC anti-plagiarism policy to control AD and hence calls for a more comprehensive and spirited implementation of the policy. Likewise, it was also found that personal sanctions/morality is a strong inhibitor of other crimes but not AD. This result implies that AD amongst the university teachers and researchers may be an acceptable act (since personal inhibitions are not active against AD). This calls for a dire need to activate the personal inhibitors against AD. This can be done by the Quality Enhancement Cells (QEC) established in each university by the HEC by educating university employees regarding the harms associated with AD. Moreover, given that HC variables are strong predictors of AD, the QEC can focus on enhancing the HC of the university employees to curb the menace of AD.

[31] The Government of Khyber Pakhtunkhwa has recently launched an alternative form of dispute resolution system, which are called Dispute Resolution Councils, and can be considered as one of the alternative forms.
[32] For Instance, shame punishment may be more effective in controlling some crime than imprisonment.

7.3 Limitations

Despite painstaking efforts to make the study as free from limitations as possible, there are several limitations in the study which should be covered in future research. Unlike other similar studies which predominantly use samples of unsuccessful' criminals (Jonck et al., 2015), the present study uses a diverse sample including ex-inmates, university level students and employees. Even then the sample cannot be termed as a representative one. The sample lacks the characteristics of a representative sample at least with respect to gender, type of criminals in the ex-inmate's sub-sample, and most importantly with respect to university teachers/researchers.

Second, as compared to published secondary data, survey method is an efficient way to collect individual level data and study crime (Bowman & Seifert, 2011; Ramakers et al., 2014). But there are still concerns in the type of survey method employed in this study that should be addressed in the future research. For instance, one obvious concern relates to the use of self-reported offending used as a dependent variable in the study. The self-reported offending may or may not be a credible measure of actual offending depending on several things. The respondents may be subject to memory loss and may not accurately recall and report their involvement in a criminal act (Williams et al., 2010; Porter, 2011). Although the study has taken special care of the anonymity of the respondents, it is still possible that self-reports may be false due to social undesirability of the acts. All such possibilities could negatively affect the results of the study.

Third, the various measures of crime used in the study (frequency and variety scores) do not take account of the seriousness of crimes. That is, frequency scores lump together all crime categories irrespective of the nature of a particular crime. Same is the case with variety scores which lump together similar (but not identical with respect to seriousness) crimes. Fourth, some of the probability measures may not be accurate due to under-representations of the items in each questionnaire. For instance, the focus in the ex-inmate's sample was on violent crimes and hence most of the items in the probability measures (11 out of 16) of the ex-inmate's questionnaire were related to violent crimes. Although the analysis in the ex-inmate's sample are also carried out for property crimes and other crimes, the respective probability measure included only 3 and 2 items respectively. Although the use of even a single item measures are sometimes advised to save on time and energy, the under-representation of item in the questionnaires might have caused inaccurate measurement of the respective probabilities in specific situations.

Fifth, some of the measures did not performed well with respect to reliability in specific samples. A case in point is the time and risk preference measures which achieved the maximum C-Alpha value well below 0.5 in the ex-inmate's sample. Future research should focus on developing more reliable measures that should perform equally well across different types of samples. Sixth, the questionnaire used for university employees (both faculty and administration) was the same. Some of the listed crimes in the questionnaire (and the associated items in the probability measures) were not relevant for one of the groups. For instance, administrative staff seldom indulge in research activities and the questions of academic dishonesty were irrelevant for this sub-group of the university's employees. The use of a single questionnaire for the two sub-groups was adopted to save on monetary costs. But this practice costed much more in terms of time and energy. Future research should use separate questionnaire for each group.

Sixth, as one of the reviewers has rightly pointed out, the purely cross-sectional regressions estimated in this study does not take care of the unobservable specific to individuals. The estimated regression models in this study covers variations across individuals but are unable to control for variations within individuals' overtime. This however is only possible in pooled/panel data and future researchers are recommended to incorporate this observation in their studies.

Lastly, the study (to the best of my knowledge) is a pioneer in exploring the root causes of academic dishonesty amongst the academic staff in universities. But as mentioned in the analysis chapter, it was very hard to get data from the academic staff in universities. None of the professors and associate professors returned the questionnaire. They could have returned the questionnaire with false reporting but the mention of BTS might have caused them not to return. Thus, the results are based on self-reported academic dishonesty of assistant professors and lecturers (majority of them). The results may not reflect a true picture of the prevalence of academic dishonesty in the country for several reasons. For instance, besides years of experience, academic research is the most important criteria for promotion to (or hiring of) associate and full professorship in Pakistan (no research is required for the posts of lecturer and assistant professor). Thus, the complete absence of associate and full professors from the sample implies the utter violations of a representative sample. However, it is believed that assistant professors and lecturers also seek career promotions which hinges upon their research endeavors. Given this, the results may be valid for policy formulations, but future research should make it convenient to include all stakeholders in their sample.

References

Aaronson, D., & Sullivan, D. (2001). Growth in worker quality. *Economic Perspectives-Federal Reserve Bank of Chicago, 25*(4), 53-74.

Abowd, J. M., Haltiwanger, J., Jarmin, R., Lane, J., Lengermann, P., McCue, K., . . . Sandusky, K. (2005). The relation among human capital, productivity, and market value: Building up from micro evidence *Measuring capital in the new economy* (pp. 153-204): University of Chicago Press.

Acemoglu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. *Handbook of labor economics, 4*, 1043-1171.

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology, 30*(1), 47-88.

Agnew, R. (2001). Building on the foundation of general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. *Journal of Research in Crime and Delinquency, 38*(4), 319-361.

Agnew, R. (2005). *Why do criminals offend?: A general theory of crime and delinquency*: Roxbury Los Angeles, CA.

Agnew, R. (2006). General strain theory: Current status and directions for further research. *Taking stock: The status of criminological theory, 15*, 101-123.

Agnew, R. (2010). A general strain theory of terrorism. *Theoretical Criminology, 14*(2), 131-153.

Agnew, R., Matthews, S. K., Bucher, J., Welcher, A. N., & Keyes, C. (2008). Socioeconomic status, economic problems, and delinquency. *Youth & Society, 40*(2), 159-181.

Ahlroth, S., Björklund, A., & Forslund, A. (1997). The output of the Swedish education sector. *Review of Income and Wealth, 43*(1), 89-104.

Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*: Sage.

Akçomak, İ. S., & ter Weel, B. (2012). The impact of social capital on crime: Evidence from the Netherlands. *Regional Science and Urban Economics, 42*(1), 323-340.

Akers, R. L. (1997). Criminological theories: Introduction and evaluation. Los Angeles. *CA: Roxbury*.

Alam, I., Muhammad, N., Ahmed, S., Ahmad, S., & Ullah, K. (2014). Crime and Insurgency in FATA: A Public Perception Survey of Khyber Agency. *Pakistan Journal of Criminology, 6*(2), 147.

Allen, R. C. (1996). Socioeconomic conditions and property crime. *American Journal of Economics and Sociology, 55*(3), 293-308.

Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of public economics, 1*(3-4), 323-338.

Altindag, D. T. (2012). Crime and unemployment: Evidence from Europe. *International Review of Law and Economics, 32*(1), 145-157.

Anderson, D. A. (2012). The cost of crime. *Foundations and Trends® in Microeconomics, 7*(3), 209-265.

Andreoni, J., & Sprenger, C. (2012). Estimating time preferences from convex budgets. *The American Economic Review, 102*(7), 3333-3356.

Anjum, S. (2013) Crime Report of five years Issued. *The News International*. [Online] 29th March. Available from: http://www.thenews.com.pk. [Accessed: 17th January 2015].

Antoci, A., Maccioni, A. F., Sacco, P. L., & Sodini, M. (2017). Self-protection, psychological externalities, and the social dynamics of fear. *Journal of conflict resolution, 61*(2), 349-371.

Anwar, S., & Loughran, T. A. (2011). Testing a Bayesian learning theory of deterrence among serious juvenile offenders. *Criminology, 49*(3), 667-698.

Apel, R. (2013). Sanctions, perceptions, and crime: Implications for criminal deterrence. *Journal of Quantitative Criminology, 29*(1), 67-101.

Apel, R., & Nagin, D. S. (2011). Deterrence. *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*.

Apel, R., & Sweeten, G. (2010). The impact of incarceration on employment during the transition to adulthood. *Social problems, 57*(3), 448-479.

Aquilino, W. S., & LoSciuto, L. A. (1990). Interview mode effects in drug use surveys. *Public Opinion Quarterly, 54*, 362-395.

Arum, R., & LaFree, G. (2008). Educational attainment, teacher-student ratios, and the risk of adult incarceration among US birth cohorts since 1910. *Sociology of Education, 81*(4), 397-421.

Atkins, R. A., & Rubin, P. H. (2003). Effects of Criminal Procedure on Crime Rates: Mapping Out the Consequences of the Exclusionary Rule. *The Journal of Law and Economics, 46*(1), 157-179.

Bales, W. D., & Piquero, A. R. (2012). Assessing the impact of imprisonment on recidivism. *Journal of Experimental Criminology, 8*(1), 71-101.

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of personality and social psychology, 71*(2), 364.

Bar-Gill, O., & Harel, A. (2001). Crime rates and expected sanctions: The economics of deterrence revisited. *The Journal of Legal Studies, 30*(2), 485-501.

Barlow, H. D., & Kauzlarich, D. (2010). *Explaining crime: A primer in criminological theory*: Rowman & Littlefield.

Barr, R., & Pease, K. (2002). A place for every crime and every crime in its place. *Crime, Policing and Place: Essays in Environmental Criminology*, 196.

Barrett, K. C. (1998). The origins of guilt in early childhood. *Guilt and children*, 75-90.

Barro, R. J. (1992). Human capital and economic growth. *Proceedings, Federal Reserve Bank of Kansas City*, 199-230.

Barro, R. J., & Lee, J.-W. (1994). *Sources of economic growth.* Paper presented at the Carnegie-Rochester conference series on public policy.

Bates, L., Darvell, M. J., & Watson, B. (2017). Young and unaffected by road policing strategies: Using deterrence theory to explain provisional drivers'(non) compliance. *Australian & New Zealand Journal of Criminology, 50*(1), 23-38.

Batool, S., & Ishaq, S. (2014). Impact of TV Crime Shows on Rob Criminals of District Camp Jail, Lahore: A Critical Analysis of Travis Hirschi's Social Bond Theory. *Pakistan Journal of Criminology, 6*(2), 13.

Bayer, P., Hjalmarsson, R., & Pozen, D. (2009). Building criminal capital behind bars: Peer effects in juvenile corrections. *The Quarterly Journal of Economics, 124*(1), 105-147.

Bayley, D. H. (1994). International differences in community policing. *The challenge of community policing: Testing the promises*, 278-281.

Beccaria, C. & Young, D. (1986) *On Crime and Punishment*. United States: Hackett Publishing (Original work published 1764).

Becker Howard, S. (1963). Outsiders. *Studies in the Sociology of Deviance*.

Becker, G. S. (1968). Crime and punishment: An economic approach *The economic dimensions of crime* (pp. 13-68): Springer.

Becker, H. (1973). Outsiders. Rev. ed: New York: Free Press.

Becker, H. S. (1966). *Social problems: A modern approach*: J. Wiley and Sons.

Benson, B. L., Kim, I., & Rasmussen, D. W. (1994). Estimating deterrence effects: a public choice perspective on the economics of crime literature. *Southern Economic Journal*, 161-168.

Bentham, J. (2007) *An Introduction to the Principles of Morals and Legislation*. New York: Dover Publications (Original work published 1789)

Berk, R. A., Lenihan, K. J., & Rossi, P. H. (1980). Crime and poverty: Some experimental evidence from ex-offenders. *American sociological review*, 766-786.

Bernard, T. J., Snipes, J. B., Gerould, A. L. and Vold, G. B. (2015) *Vold's Theoretical Criminology*. 7th Ed. New York: Oxford University Press.

Bernasco, W. (2010). A sentimental journey to crime: Effects of residential history on crime location choice. *Criminology, 48*(2), 389-416.

Bernburg, J. G., Thorlindsson, T., & Sigfusdottir, I. D. (2009). Relative deprivation and adolescent outcomes in Iceland: A multilevel test. *Social Forces, 87*(3), 1223-1250.

Bersani, B. E., & Doherty, E. E. (2013). When the ties that bind unwind: Examining the enduring and situational processes of change behind the marriage effect. *Criminology, 51*(2), 399-433.

Bjørnskov, C. (2006) The Multiple Facets of Social Capital. *European Journal of Political Economy,* 22, 22–40.

Blau, J. R., & Blau, P. M. (1982). The cost of inequality: Metropolitan structure and violent crime. *American sociological review*, 114-129.

Block, M. K., & Heineke, J. M. (1975). A labor theoretic analysis of the criminal choice. *The American Economic Review, 65*(3), 314-325.

Blumstein, A., Cohen, J., & Nagin, D. (1978). *Deterrence and incapacitation: Estimating the effects of criminal sanctions on crime rates*: Natl Academy Pr.

Bottoms, A., & Tankebe, J. (2012). Beyond procedural justice: A dialogic approach to legitimacy in criminal justice. *The journal of criminal law and criminology*, 119-170.

Bourguignon, F., Nuñez, J., & Sanchez, F. (2003). What part of the income distribution does matter for explaining crime? The case of Columbia: DELTA (Ecole normale supérieure).

Bowers, K. J., & Johnson, S. D. (2003). Measuring the geographical displacement and diffusion of benefit effects of crime prevention activity. *Journal of Quantitative Criminology, 19*(3), 275-301.

Bowles, R., & Garoupa, N. (1997). Casual police corruption and the economics of crime. *International Review of Law and Economics, 17*(1), 75-87.

Braithwaite, J. (1989). *Crime, shame and reintegration*: Cambridge University Press.

Brier, S. S., & Fienberg, S. E. (1980). Recent econometric modeling of crime and punishment: support for the deterrence hypothesis? *Evaluation Review, 4*(2), 147-191.

Broidy, L., & Agnew, R. (1997). Gender and crime: A general strain theory perspective. *Journal of Research in Crime and Delinquency, 34*(3), 275-306.

Brunton-Smith, I., Jackson, J., & Sutherland, A. (2014). Bridging structure and perception: On the neighbourhood ecology of beliefs and worries about violent crime. *British Journal of Criminology, 54*(4), 503-526.

Brush, J. (2007). Does income inequality lead to more crime? A comparison of cross-sectional and time-series analyses of United States counties. *Economics Letters, 96*(2), 264-268.

Brussels. International Crises Group. (2011) *Reforming Pakistan's Prison System.* (Asia Program Report No. 212)

Buonanno, P., & Montolio, D. (2008). Identifying the socio-economic and demographic determinants of crime across Spanish provinces. *International Review of Law and Economics, 28*(2), 89-97.

Buonanno, P., Montolio, D., & Vanin, P. (2009). Does social capital reduce crime?. *The journal of law and economics*, *52*(1), 145-170.

Buonanno, P., Pasini, G., & Vanin, P. (2012). Crime and social sanction. *Papers in Regional Science*, *91*(1), 193-218.

Burgess, R. L., & Akers, R. L. (1966). A differential association-reinforcement theory of criminal behavior. *Social problems, 14*(2), 128-147.

Burke, R. H. (2013). *An introduction to criminological theory*: Routledge.

Bursik Jr, R. J., & Grasmick, H. G. (1993). Economic deprivation and neighborhood crime rates, 1960-1980. *Law & Soc'y Rev., 27*, 263.

Calvó-Armengol A, Zenou Y (2004) Social networks and crime decisions: The role of social structure in facilitating delinquent behavior. *International Economic Review,* 45, 939-958.

Cameron, A. C., & Trivedi, P. K. (2013). *Regression analysis of count data* (Vol. 53): Cambridge university press.

Cantor, D., & Land, K. C. (1985). Unemployment and crime rates in the post-World War II United States: A theoretical and empirical analysis. *American sociological review*, 317-332.

Capaldi, D. M., Chamberlain, P., & Patterson, G. R. (1997). Ineffective discipline and conduct problems in males: Association, late adolescent outcomes, and prevention. *Aggression and violent behavior, 2*(4), 343-353.

Carmichael, F., & Ward, R. (2001). Male unemployment and crime in England and Wales. *Economics Letters, 73*(1), 111-115.

Carneiro, F. G., Loureiro, P. R., & Sachsida, A. (2005). Crime and social interactions: a developing country case study. *The Journal of Socio-Economics, 34*(3), 311-318.

Chintrakarn, P., & Herzer, D. (2012). More inequality, more crime? A panel cointegration analysis for the United States. *Economics Letters, 116*(3), 389-391.

Chisholm, J., & Choe, C. (2005). Income variables and the measures of gains from crime. *Oxford Economic Papers, 57*(1), 112-119.

Chitkara, M.G. (1997) *Human Rights in Pakistan.* New Delhi: A.P.H. Publishing Corporation.

Choe, J. (2008). Income inequality and crime in the United States. *Economics Letters, 101*(1), 31-33.

Chotani, H. A., Razzak, J. A., & Luby, S. P. (2002). Patterns of violence in Karachi, Pakistan. *Injury Prevention, 8*(1), 57-59.

Clarke, R. V. G., & Felson, M. (1993). *Routine activity and rational choice* (Vol. 5): Transaction publishers.

Clarke, R. V. G., & Felson, M. (1993). *Routine activity and rational choice* (Vol. 5): Transaction publishers.

Clarke, R. V. G., & Newman, G. R. (2006). *Outsmarting the terrorists*: Greenwood Publishing Group.

Cochran, J. K. (2015). Morality, Rationality and Academic Dishonesty: A Partial Test of Situational Action Theory. *International Journal of Criminology and Sociology, 4*, 192-199.

Cochran, J. K. (2016). Moral propensity, setting, and choice: A partial test of situational action theory. *Deviant Behavior, 37*(7), 811-823.

Cochran, W. G. (1977). Sampling techniques-3.

Cohen, A. (1955). Delinquent boys. *New York, 84*.

Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American sociological review*, 588-608.

Coleman, C., & Moynihan, J. (1996). Understanding Crime Data, Buckingham: Philadelphia: Open University Press.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology, 94*, S95-S120.

Conklin, J. E. (1977) *Illegal but not Criminal: Business Crime in America*. United States: Pearson Education.

Cook, P. J. (1977). Punishment and crime: a critique of current findings concerning the preventive effects of punishment. *Law and contemporary problems, 41*(1), 164-204.

Cook, P. J. (2010). Property crime—yes; violence—no. *Criminology & Public Policy, 9*(4), 693-697.

Cook, P. J., & Zarkin, G. A. (1985). Crime and the business cycle. *The Journal of Legal Studies, 14*(1), 115-128.

Copes, H., & Vieraitis, L. M. (2012). *Identity thieves: Motives and methods*: UPNE.

Corbacho, A., Philipp, J., & Ruiz-Vega, M. (2015). Crime and erosion of trust: Evidence for Latin America. *World Development, 70*, 400-415.

Corman, H., & Mocan, H. N. (2000). A time-series analysis of crime, deterrence, and drug abuse in New York City. *The American Economic Review, 90*(3), 584-604.

Corman, H., & Mocan, N. (2005). Carrots, sticks, and broken windows. *The Journal of Law and Economics, 48*(1), 235-266.

Cornish, D. B., & Clarke, R. V. (1987). Understanding crime displacement: An application of rational choice theory. *Criminology, 25*(4), 933-948.

Cornish, D. B., & Clarke, R. V. (1989). Crime specialisation, crime displacement and rational choice theory *Criminal behavior and the justice system* (pp. 103-117): Springer.

Cornish, D. B., & Clarke, R. V. (2008). The rational choice perspective. *Environmental criminology and crime analysis, 21*.

Cornish, D. B., & Clarke, R. V. (2014). *The reasoning criminal: Rational choice perspectives on offending*: Transaction Publishers.

Cornish, D., & Clarke, R. (1986). Situational prevention, displacement of crime and rational choice theory. *Situational crime prevention: From theory into practice*, 1-16.

Costa, A. M. (2010). The economics of crime: A discipline to be invented and a Nobel Prize to be awarded. *Journal of Policy Modeling, 32*(5), 648-661.

Cox, R. (2010). Crime, incarceration, and employment in light of the great recession. *The Review of Black Political Economy, 37*(3-4), 283-294.

Crenshaw, M. (1981). The causes of terrorism. *Comparative politics, 13*(4), 379-399.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika, 16*(3), 297-334.

Curcio, A. L., Mak, A. S., & George, A. M. (2017). Predictors of delinquency among adolescents and young adults: A new psychosocial control perspective. *Australian & New Zealand Journal of Criminology, 50*(2), 155-175.

Dagum, C., & Slottje, D. J. (2000). A new method to estimate the level and distribution of household human capital with application. *Structural change and economic dynamics, 11*(1), 67-94.

David, J. E. (2006) The one who is more Violent Prevails: Law and Violence from a Talmudic Legal Perspective. *Canadian Journal of Law and Jurisprudence*. 19(2). P. 385–406.

DeLisi, M., & Hochstetler, A. (2002). An exploratory assessment of tittle's control balance theory: Results from the national youth survey. *The Justice Professional, 15*(3), 261-272.

Di Tella, R., Edwards, S., & Schargrodsky, E. (2010). *The economics of crime: Lessons for and from Latin America*: University of Chicago Press.

Diewald, M., & Faist, T. (2011). From heterogeneities to inequalities: Looking at social mechanisms as an explanatory approach to the generation of social inequalities.

Dinwiddy, J. R. (1989). Adjudication under Bentham's Pannomion. *Utilitas, 1*(2), 283-289.

Dixon, H. (2001). Surfing economics.

D'Orsogna, M. R., & Perc, M. (2015). Statistical physics of crime: A review. *Physics of life reviews, 12*, 1-21.

Draca, M., Machin, S., & Witt, R. (2011). Panic on the streets of london: Police, crime, and the july 2005 terror attacks. *The American Economic Review, 101*(5), 2157-2181.

Dumont, D. M., Brockmann, B., Dickman, S., Alexander, N., & Rich, J. D. (2012). Public health and the epidemic of incarceration. *Annual review of public health, 33*, 325-339.

Duraisamy, P. (2002). Changes in returns to education in India, 1983–94: by gender, age-cohort and location. *Economics of Education Review, 21*(6), 609-622.

Edmark, K. (2005). Unemployment and crime: Is there a connection? *The Scandinavian journal of economics, 107*(2), 353-373.

Edwards, B., & Foley, M. W. (1997). Social capital and the political economy of our discontent. *American Behavioral Scientist, 40*(5), 669-678.

Ehrlich, I. (1973). Participation in illegitimate activities: A theoretical and empirical investigation. *Journal of political Economy, 81*(3), 521-565.

Ehrlich, I. (1996). Crime, punishment, and the market for offenses. *The Journal of Economic Perspectives, 10*(1), 43-67.

Eide, E., Rubin, P. H., & Shepherd, J. M. (2006). Economics of crime. *Foundations and Trends® in Microeconomics, 2*(3), 205-279.

Eiling, E. (2013). Industry-specific human capital, idiosyncratic risk, and the cross-section of expected stock returns. *The Journal of Finance, 68*(1), 43-84.

Eisner, E. W. (1985). *The art of educational evaluation: A personal view*: Taylor & Francis.

Ellis, L. (1988). The victimful-victimless crime distinction, and seven universal demographic correlates of victimful criminal behavior. *Personality and Individual Differences, 9*(3), 525-548.

Elster, J. (1999). *Alchemies of the Mind: Rationality and the Emotions*: Cambridge University Press.

Engel, C., Beckenkamp, M., Glöckner, A., Irlenbusch, B., Hennig-Schmidt, H., Kube, S., . . . Normann, H.-T. (2014). First impressions are more important than early intervention: Qualifying broken windows theory in the lab. *International Review of Law and Economics, 37*, 126-136.

Engelhardt, B., Rocheteau, G., & Rupert, P. (2008). Crime and the labor market: A search model with optimal contracts. *Journal of public economics, 92*(10), 1876-1891.

Entorf, H., & Spengler, H. (2000). Socioeconomic and demographic factors of crime in Germany: Evidence from panel data of the German states. *International Review of Law and Economics, 20*(1), 75-106.

Evans, W. N., & Owens, E. G. (2007). COPS and Crime. *Journal of public economics, 91*(1), 181-201.

Fagan, J., West, V., & Hollan, J. (2002). Reciprocal effects of crime and incarceration in New York City neighborhoods. *Fordham Urb. LJ, 30*, 1551.

Fajnzylber, P., Lederman, D., & Loayza, N. (2002). Inequality and violent crime. *The Journal of Law and Economics, 45*(1), 1-39.

Fajnzylber, P., Lederman, D., & Loayza, N. (2002). What causes violent crime? *European Economic Review, 46*(7), 1323-1357.

Fallahi, F., & Rodríguez, G. (2014). Link between unemployment and crime in the US: A Markov-Switching approach. *Social science research, 45*, 33-45.

Farooq, O. (2017). A dynamic assessment of the size of underground economy and tax evasion in Pakistan. *Paradigms, 11*(1), 6.

Farrell, G., Tseloni, A., Mailley, J., & Tilley, N. (2011). The crime drop and the security hypothesis. *Journal of Research in Crime and Delinquency, 48*(2), 147-175.

Farrington, D. P. (1982). Longitudinal analyses of criminal violence. *Criminal violence*, 171-200.

Farrington, D. P. (1989). Early predictors of adolescent aggression and adult violence. *Violence and victims, 4*(2), 79.

Farrington, D. P., Gallagher, B., Morley, L., St. Ledger, R. J., & West, D. J. (1986). Unemployment, school leaving, and crime. *The British Journal of Criminology, 26*(4), 335-356.

Felson, M. (1995). Those who discourage crime. *Crime and place, 4*, 53-66.

Felson, M., & Boba, R. L. (2010). *Crime and everyday life*: Sage.

Fergusson, D. M., Horwood, L. J., & Woodward, L. J. (2001). Unemployment and psychosocial adjustment in young adults: causation or selection? *Social science & medicine, 53*(3), 305-320.

Fink, A. (1995). The survey handbook (Vol. 1). *Thousand Oaks, CA*.

Forst, B. E. (1976). The deterrent effect of capital punishment: A cross-state analysis of the 1960's. *Minn. L. Rev., 61*, 743.

Fox, K. A., Nobles, M. R., & Lane, J. (2016). Control balance behind bars: Testing the generality of Tittle's theory among incarcerated men and women. *Crime & Delinquency, 62*(7), 925-953.

Fujita, S., & Maxfield, M. (2012). Security and the drop in car theft in the United States. *The international crime drop: New directions in research*, 231-249.

Funk, P., & Kugler, P. (2003). Identifying Efficient Crime-Combating Policies by VAR Models: The Example of Switzerland. *Contemporary Economic Policy, 21*(4), 525-538.

Gallupe, O., & Baron, S. W. (2014). Morality, self-control, deterrence, and drug use: Street youths and situational action theory. *Crime & Delinquency, 60*(2), 284-305.

Gardner, W., Mulvey, E. P., & Shaw, E. C. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological bulletin, 118*(3), 392.

Garland, D. (2002). Of crimes and criminals: The development of criminology in Britain. *The Oxford handbook of criminology, 3*, 7-50.

Gaviria, A. (2000). Increasing returns and the evolution of violent crime: the case of Colombia. *Journal of development economics, 61*(1), 1-25.

Gecas, V. (2001). The self as a social force. *Extending Self-esteem theory and research: Sociological and psychological currents*, 85-100.

Geller, A. (2007). Neighborhood disorder and crime: an analysis of broken windows in New York City.

Gibbons, T. (1982). The utility of economic analysis of crime. *International Review of Law and Economics, 2*(2), 173-191.

Gillani, S. Y. M., Khan, R. E. A., & Rashid Gill, A. (2015). Unemployment and property crimes in Pakistan.

Gillani, S. Y. M., Rehman, H. U., & Gill, A. R. (2009). Unemployment, poverty, inflation and crime nexus: cointegration and causality analysis of Pakistan. *Pakistan Economic and Social Review*, 79-98.

Gilling, D. (1997). *Crime prevention: Theory, policy, and politics*: Psychology Press.

Gladwell, M. (2000). The Tipping Point (London. *Abacus*, 25.

Glaeser, E.L., Sacerdote, B., & Scheinkman, J.A. (1996) Crime and social interactions. *Quarterly Journal of Economics*, 111, 507-548.

Golub, A., Johnson, B. D., & Dunlap, E. (2007). The race/ethnicity disparity in misdemeanor marijuana arrests in New York City. *Criminology & Public Policy, 6*(1), 131-164.

Gould, E. D., & Stecklov, G. (2009). Terror and the Costs of Crime. *Journal of public economics, 93*(11), 1175-1188.

Gould, E. D., Weinberg, B. A., & Mustard, D. B. (2002). Crime rates and local labor market opportunities in the United States: 1979–1997. *The Review of Economics and Statistics, 84*(1), 45-61.

Government of Pakistan. (2017) Pakistan Economic Survey 2016-17. Islamabad: Finance Division.

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology, 101*(2), 366.

Grasmick, H. G., Tittle, C. R., Bursik Jr, R. J., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency, 30*(1), 5-29.

Greene, J. A. (1999). Zero tolerance: A case study of police policies and practices in New York City. *NCCD news, 45*(2), 171-187.

Griffin, M. L., & Armstrong, G. S. (2003). The effect of local life circumstances on female probationers' offending. *Justice Quarterly, 20*(2), 213-239.

Grubb, M. C. (2002). Federal habeas review: the Supreme Court's failure to apply Williams consistently. *J. Crim. L. & Criminology, 93*, 75.

Gujarati, D. N. (2009). *Basic econometrics*: Tata McGraw-Hill Education.

Hair Jr, J. F., Anderson, R. E., Tatham, R. L., & William, C. (1995). Black (1995), Multivariate data analysis with readings. *New Jersy: Prentice Hall*.

Halicioglu, F., Andrés, A. R., & Yamamura, E. (2012). Modeling crime in Japan. *Economic Modelling, 29*(5), 1640-1645.

Halinski, R. S., & Feldt, L. S. (1970). The selection of variables in multiple regression analysis. *Journal of Educational Measurement, 7*(3), 151-157.

Han, L., Bandyopadhyay, S., & Bhattacharya, S. (2013). Determinants of violent and property crimes in England and Wales: A panel data analysis. *Applied Economics, 45*(34), 4820-4830.

Harcourt, B. E., & Ludwig, J. (2006). Broken windows: New evidence from New York City and a five-city social experiment. *The University of Chicago Law Review*, 271-320.

Hardoon, D., & Heinrich, F. (2013). *Global corruption barometer 2013*: Transparency International.

Hauner, D., Kutan, A. M., & Spivey, C. (2012). Inequality and crime: evidence from Russia's regions. *Applied Economics Letters, 19*(17), 1667-1671.

Haynie, D.L. (2001) Delinquent peers revisited: Does network structure matter? *American Journal of Sociology*, 106, 1013-1057.

Heal, G., & Kunreuther, H. (2007). Modeling interdependent risks. *Risk Analysis, 27*(3), 621-634.

Heimer, K., & Matsueda, R. L. (1994). Role-taking, role commitment, and delinquency: A theory of differential social control. *American sociological review*, 365-390.

Heineke, J. (1978). Economic models of criminal behavior: An overview.

Henry, G. T. (1990). *Practical sampling* (Vol. 21): Sage.

Hensley, L., Kirkpatrick, K., & Burgoon, J. (2013). Relation of gender, course enrollment, and grades to distinct forms of academic dishonesty. *Teaching in Higher Education, 18*(8), 895-907.

Hilbe, J. M. (2011). Modeling count data *International Encyclopedia of Statistical Science* (pp. 836-839): Springer.

Hindelang, M. J., Hirschi, T., & Weis, J. G. (1981). *Measuring delinquency*: Sage Publications Beverly Hills.

Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. *American journal of sociology, 89*(3), 552-584.

Hirschi, T., & Gottfredson, M. R. (2001). Self-control theory. *Explaining criminals and crime*, 81-96.

Hjalmarsson, R., Holmlund, H., & Lindquist, M. J. (2015). The Effect of Education on Criminal Convictions and Incarceration: Causal Evidence from Micro-data. *The Economic Journal, 125*(587), 1290-1326.

Holt, C. A., & Laury, S. (2002). Risk aversion and incentive effects.

Holtfreter, K., Reisig, M. D., Leeper Piquero, N., & Piquero, A. R. (2010). Low self-control and fraud: Offending, victimization, and their overlap. *Criminal Justice and Behavior, 37*(2), 188-203.

Horney, J., & Marshall, I. H. (1992). Risk perceptions among serious offenders: The role of crime and punishment. *Criminology, 30*(4), 575-594.

Huang, C.-L., Yang, S. C., & Chen, A.-S. (2015). The relationships among students' achievement goals, willingness to report academic dishonesty, and engaging in academic dishonesty. *Social Behavior and Personality: an international journal, 43*(1), 27-37.

Huebner, B. M. (2005). The effect of incarceration on marriage and work over the life course. *Justice Quarterly, 22*(3), 281-303.

Hughes, L. A., Antonaccio, O., & Botchkovar, E. V. (2015). How general is control balance theory? Evidence from Ukraine. *Justice Quarterly, 32*(6), 950-975.

Hussain, F. (2011). *The judicial system of Pakistan*: Supreme Court of Pakistan.

Hutcherson, D. T. (2012). Crime pays: The connection between time in prison and future criminal earnings. *The Prison Journal, 92*(3), 315-335.

Index, G. P. (2015). Measuring peace, its causes and its economic value. *Institute for Economics and Peace (http://economicsandpeace. org/), http://www. visionofhumanity. org/sites/default/files/Global% 20Peace% 20Index% 20Report% 202015_0. pdf*.

Islam, A. (2016). An exploration of the relationship between police presence, crime and firms in developing countries. *Development Policy Review, 34*(5), 691-719.

Jabbar, M., & Mohsin, H. (2014). Does Police Strength and Conviction Help to Deter Violent. *International Journal of Economics and Empirical Research, 2*, 2-52.

Jaccard, J., Wan, C. K., & Turrisi, R. (1990). The detection and interpretation of interaction effects between continuous variables in multiple regression. *Multivariate behavioral research, 25*(4), 467-478.

Jacob, A. (2011). Economic theories of crime and delinquency. *Journal of Human Behavior in the Social Environment, 21*(3), 270-283.

Jacques, S., & Wright, R. (2012). Ironies of crime, control, and criminology. *Critical Criminology, 20*(2), 153-167.

Jalil, H. H., & Iqbal, M. M. (2010). Urbanisation and crime: A case study of Pakistan. *The Pakistan Development Review*, 741-755.

Jeffers, J. (1967). Two case studies in the application of principal component analysis. *Applied Statistics*, 225-236.

Jonck, P., Goujon, A., Testa, M. R., & Kandala, J. (2015). Education and crime engagement in South Africa: A national and provincial perspective. *International Journal of Educational Development, 45*, 141-151.

Jorgenson, D. W., & Fraumeni, B. M. (1989). Investment in education. *Educational Researcher, 18*(4), 35-44.

Jorgenson, D. W., & Fraumeni, B. M. (1992). Investment in education and US economic growth. *The Scandinavian journal of economics*, S51-S70.

Kalton, G. (1983). *Introduction to survey sampling* (Vol. 35): Sage.

Katz, C. M., Webb, V. J., & Schaefer, D. R. (2001). An assessment of the impact of quality-of-life policing on crime and disorder. *Justice Quarterly, 18*(4), 825-876.

Katz, L., Levitt, S. D., & Shustorovich, E. (2003). Prison conditions, capital punishment, and deterrence. *American Law and Economics Review, 5*(2), 318-343.

Keizer, K., Lindenberg, S., & Steg, L. (2008). The spreading of disorder. *Science, 322*(5908), 1681-1685.

Kelling, G. L., & Sousa, W. H. (2001). *Do police matter?: An analysis of the impact of new york city's police reforms*: CCI Center for Civic Innovation at the Manhattan Institute.

Kelly, M. (2000). Inequality and crime. *The Review of Economics and Statistics, 82*(4), 530-539.

Kendrick, J. W. (1976). The formation and stocks of total capital. *NBER Books*.

Kerr, D. C., Capaldi, D. M., Owen, L. D., Wiesner, M., & Pears, K. C. (2011). Changes in at-risk American men's crime and substance use trajectories following fatherhood. *Journal of Marriage and Family, 73*(5), 1101-1116.

Kessler, D., & Levitt, S. D. (1999). Using sentence enhancements to distinguish between deterrence and incapacitation. *The Journal of Law and Economics, 42*(S1), 343-364.

Khan, N., Ahmed, J., Nawaz, M., & Zaman, K. (2015). The socio-economic determinants of crime in Pakistan: New evidence on an old debate. *Arab Economic and Business Journal, 10*(2), 73-81.

Khan, Q. (2016) Sunday Magazine. Daily Aaj [Dated: January, 10, 2016]. P. 7.

Khan, W. (2017) Masculinity and Criminality: The Masculine Dimensions of Violent Crimes among Pakhtuns of Khyber Pakhtunkhwa, Pakistan. Unpublished PhD Thesis.

Khyber Pakhtunkhwa. Bureau of Statistics. (2015) *Khyber Pakhtunkhwa in Figure 2014*. [Online]. Available from: http://kpbos.gov.pk/. [Accessed: 29th December, 2015].

King, R. D., Massoglia, M., & MacMillan, R. (2007). The context of marriage and crime: Gender, the propensity to marry, and offending in early adulthood. *Criminology, 45*(1), 33-65.

Kisamore, J. L., Stone, T. H., & Jawahar, I. (2007). Academic integrity: The relationship between individual and situational factors on misconduct contemplations. *Journal of Business Ethics, 75*(4), 381-394.

Kleck, G., & Barnes, J. (2013). Deterrence and Macro-Level Perceptions of Punishment Risks: Is There a "Collective Wisdom"? *Crime & Delinquency, 59*(7), 1006-1035.

Kleck, G., & Barnes, J. (2014). Do more police lead to more crime deterrence? *Crime & Delinquency, 60*(5), 716-738.

Kleck, G., Sever, B., Li, S., & Gertz, M. (2005). The missing link in general deterrence research. *Criminology, 43*(3), 623-660.

Klepper, S., & Nagin, D. (1989). The deterrent effect of perceived certainty and severity of punishment revisited. *Criminology, 27*(4), 721-746.

Klimidis, S., Minas, I. H., & Ata, A. (1992). The PBI-BC: A brief current form of the Parental Bonding Instrument for adolescent research. *Comprehensive psychiatry, 33*(6), 374-377.

Knack, S., & Keefer, P. (1997) Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *Quarterly Journal of Economics*, 112,1251–88.

Kollias, C., Mylonidis, N., & Paleologou, S.-M. (2013). Crime and the effectiveness of public order spending in Greece: Policy implications of some persistent findings. *Journal of Policy Modeling, 35*(1), 121-133.

Kolm, S.-C. (1973). A note on optimum tax evasion. *Journal of public economics, 2*(3), 265-270.

Kornhauser, R. R. (1978). *Social sources of delinquency: An appraisal of analytic models*: University of Chicago Press Chicago.

Kreager, D. A., Matsueda, R. L., & Erosheva, E. A. (2010). Motherhood and criminal desistance in disadvantaged neighborhoods. *Criminology, 48*(1), 221-258.

Kriven, S., & Ziersch, E. (2007). New car security and shifting vehicle theft patterns in Australia. *Security Journal, 20*(2), 111-122.

Krohn, M., Waldo, G. P., & Chiricos, T. G. (1974). Self-reported delinquency: A comparison of structured interviews and self-administered checklists. *The Journal of Criminal Law and Criminology (1973-), 65*(4), 545-553.

Kroneberg, C., Heintze, I., & Mehlkop, G. (2010). The interplay of moral norms and instrumental incentives in crime causation. *Criminology, 48*(1), 259-294.

Lab, S. P. (2010) *Crime Prevention*. 7Th Ed. New Providence, NJ: Anderson Publishing.

Laferrière, D., & Morselli, C. (2015). Criminal achievement and self-efficacy. *Journal of Research in Crime and Delinquency, 52*(6), 856-889.

Lageson, S., & Uggen, C. (2013). How work affects crime—and crime affects work—over the life course *Handbook of life-course criminology* (pp. 201-212): Springer.

Lam, K.-C., Tao, R., & Lam, M. C.-K. (2010). A material supplier selection model for property developers using Fuzzy Principal Component Analysis. *Automation in Construction, 19*(5), 608-618.

Land, K. C., McCall, P. L., & Cohen, L. E. (1990). Structural covariates of homicide rates: Are there any invariances across time and social space? *American journal of sociology, 95*(4), 922-963.

Lang, J. M. (2013). *Cheating lessons*: Harvard University Press.

Lang, M. (2016). State Firearm Sales and Criminal Activity: Evidence from Firearm Background Checks. *Southern Economic Journal, 83*(1), 45-68.

Laub, J. H., & Sampson, R. J. (1993). Turning points in the life course: Why change matters to the study of crime. *Criminology, 31*(3), 301-325.

Lawson, R. A. (2004). Is classroom cheating related to business students' propensity to cheat in the" real world"? *Journal of Business Ethics, 49*(2), 189-199.

Le, T., Gibson, J., & Oxley, L. (2003). Cost-and Income-based Measures of Human Capital. *Journal of economic surveys, 17*(3), 271-307.

Le, T., Gibson, J., & Oxley, L. (2006). A Forward-Looking Measure of the Stock of Human Capital in New Zealand. *The Manchester School, 74*(5), 593-609.

Lee, B. X. (2016). Causes and Cures X: Criminal justice approaches. *Aggression and violent behavior, 31*, 237-242.

Leeper Piquero, N., Lyn Exum, M., & Simpson, S. S. (2005). Integrating the desire–for–control and rational choice in a corporate crime context. *Justice Quarterly, 22*(2), 252-280.

Leeper Piquero, N., Schoepfer, A., & Langton, L. (2010). Completely out of control or the desire to be in complete control? How low self-control and the desire for control relate to corporate offending. *Crime & Delinquency, 56*(4), 627-647.

Lemert, E. M. (1951). Social pathology; A systematic approach to the theory of sociopathic behavior.

Lester, M., Maheshwari, S. K., & McLain, P. M. (2013). Family Firms and Negative Social Capital: A Property Rights Theory Approach. *Journal of Behavioral and Applied Management, 15*(1), 11.

Levitt, S. D. (1998). Juvenile crime and punishment. *Journal of political Economy, 106*(6), 1156-1185.

Levitt, S. D. (2004). Understanding why crime fell in the 1990s: Four factors that explain the decline and six that do not. *The Journal of Economic Perspectives, 18*(1), 163-190.

Levitt, S. D., & Miles, T. J. (2006). Economic contributions to the understanding of crime. *Annu. Rev. Law Soc. Sci., 2*, 147-164.

Lewis, M., Alessandri, S. M., & Sullivan, M. W. (1992). Differences in shame and pride as a function of children's gender and task difficulty. *Child development, 63*(3), 630-638.

Lin, C.-H. S., & Wen, L.-Y. M. (2007). Academic dishonesty in higher education—a nationwide study in Taiwan. *Higher Education, 54*(1), 85-97.

Lin, J. (2012). Youth bulge: a demographic dividend or a demographic bomb in developing countries? *World Bank, Washington, DC*.

Lindegaard, M. R., & Jacques, S. (2014). Agency as a Cause of Crime. *Deviant Behavior, 35*(2), 85-100.

Lochner, L. (2007). Education and crime. *University of Western Ontario, 5*(8), 1-14.

Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata*: Stata press.

Lott, J. R. (1992). Do we punish high income criminals too heavily? *Economic Inquiry, 30*(4), 583-608.

Loughran, T. A., Mulvey, E. P., Schubert, C. A., Fagan, J., Piquero, A. R., & Losoya, S. H. (2009). Estimating a dose-response relationship between length of stay and future recidivism in serious juvenile offenders. *Criminology, 47*(3), 699-740.

Loughran, T. A., Paternoster, R., Chalfin, A., & Wilson, T. (2016). Can rational choice be considered a general theory of crime? Evidence from individual-level panel data. *Criminology, 54*(1), 86-112.

Loureiro, P. R., de Mendonça, M. J. C., Moreira, T. B. S., & Sachsida, A. (2009). Crime, economic conditions, social interactions and family heritage. *International Review of Law and Economics, 29*(3), 202-209.

Lustig, H., & Van Nieuweburgh, S. (2005). Can Housing Collateral Explain Long-Run Swings in Asset Returns, Working Paper. *NYU Stern and UCLA*.

Machin, S., & Meghir, C. (2004). Crime and economic incentives. *Journal of Human Resources, 39*(4), 958-979.

Machin, S., Marie, O., & Vujić, S. (2011). The crime reducing effect of education. *The Economic Journal, 121*(552), 463-484.

MacKenzie, D. L., & Li, S. D. (2002). The impact of formal and informal social controls on the criminal activities of probationers. *Journal of Research in Crime and Delinquency, 39*(3), 243-276.

Mahmood, K., & Cheema, M. A. (2004). Empirical analysis of juvenile crime in Punjab, Pakistan. *associates, 24*, 10.19.

Manski, C. F. (1978). Prospects for inference on deterrence through empirical analysis of individual criminal behavior. *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanctions on Crime Rates. National Academy of Sciences*, 400-424.

Margolis, H. (1991). Free riding versus cooperation. *Strategy and Choice, S*, 83-105.

Marvell, T. B., & Moody, C. E. (1996). Specification problems, police levels, and crime rates. *Criminology, 34*(4), 609-646.

Matsueda, R. L. (1992). Reflected appraisals, parental labeling, and delinquency: Specifying a symbolic interactionist theory. *American journal of sociology, 97*(6), 1577-1611.

Matsueda, R. L. (2013). Rational choice research in criminology: A multi-level framework. *Handbook of rational choice social research*, 283-321.

Matsueda, R. L., Kreager, D. A., & Huizinga, D. (2006). Deterring delinquents: A rational choice model of theft and violence. *American sociological review, 71*(1), 95-122.

Matza, D. (1964). Delinquency and Drift New York. *John Wiley. and G. SYKES (1961)" Juvenile delinquency and subterranean values." American Sociological Review, 26*, 715-719.

McCollister, K. E., French, M. T., & Fang, H. (2010). The cost of crime to society: New crime-specific estimates for policy and program evaluation. *Drug and alcohol dependence, 108*(1), 98-109.

McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting school connectedness: Evidence from the national longitudinal study of adolescent health. *Journal of school health, 72*(4), 138-146.

Meares, T. (2015). Broken windows, neighborhoods, and the legitimacy of law enforcement or why I fell in and out of love with Zimbardo. *Journal of Research in Crime and Delinquency, 52*(4), 609-625.

Meier, S., & Sprenger, C. (2010). Present-biased preferences and credit card borrowing. *American Economic Journal: Applied Economics, 2*(1), 193-210.

Melendez, M. C. (2005). Moving to opportunity & mending broken windows. *J. Legis., 32*, 238.

Merlo, A., & Wolpin, K. I. (2015). The transition from school to jail: Youth crime and high school completion among black males. *European Economic Review, 79*, 234-251.

Merton, R. K. (1938). Social structure and anomie. *American sociological review, 3*(5), 672-682.

Miller, D. E., & Kunce, J. T. (1973). Prediction and Statistical Overkill Revisited. *Measurement and evaluation in guidance, 6*(3), 157-163.

Milligan, K., Moretti, E., & Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the United States and the United Kingdom. *Journal of public economics, 88*(9), 1667-1695.

Monahan, K. C., Steinberg, L., Cauffman, E., & Mulvey, E. P. (2009). Trajectories of antisocial behavior and psychosocial maturity from adolescence to young adulthood. *Developmental psychology, 45*(6), 1654.

Monsbakken, C. W., Lyngstad, T. H., & Skardhamar, T. (2012). Crime and the transition to parenthood: The role of sex and relationship context. *British Journal of Criminology, 53*(1), 129-148.

Murdock, T. B., Beauchamp, A. S., & Hinton, A. M. (2008). Predictors of cheating and cheating attributions: Does classroom context influence cheating and blame for cheating? *European Journal of Psychology of Education, 23*(4), 477-492.

Myers, S. L. (1983). Estimating the economic model of crime: Employment versus punishment effects.

Nagin, D. (1978). Crime rates, sanction levels, and constraints on prison population. *Law and Society Review*, 341-366.

Nagin, D. S., Solow, R. M., & Lum, C. (2015). Deterrence, criminal opportunities, and police. *Criminology, 53*(1), 74-100.

Narayan, D., & Cassidy, M. F. (2001). A dimensional approach to measuring social capital: development and validation of a social capital inventory. *Current sociology, 49*(2), 59-102.

National Crime Report Bureau of India. (2015) *Police Strength, Expenditure and Infrastructure* [Online]. Available From: ncrb.gov.in. [Accessed: 20th January 2015].

Neumayer, E. (2005). Inequality and violent crime: Evidence from data on robbery and violent theft. *Journal of Peace Research, 42*(1), 101-112.

Nieuwbeerta, P., Nagin, D. S., & Blokland, A. A. (2009). Assessing the impact of first-time imprisonment on offenders' subsequent criminal career development: a matched samples comparison. *Journal of Quantitative Criminology, 25*(3), 227-257.

North Douglas, C. (1982). *Structure & Change in Economic History*: WW Norton.

North, D. C. (1990). *Institutions, institutional change and economic performance*: Cambridge university press.

Nye, F. I. (1958). *Family relationships and delinquent behavior*: JSTOR.

Olafson, L., Schraw, G., Nadelson, L., Nadelson, S., & Kehrwald, N. (2013). Exploring the judgment–action gap: College students and academic dishonesty. *Ethics & Behavior, 23*(2), 148-162.

O'Mahony, P. (1986). Deprivation, Crime and Individual Responsibility. *Studies: An Irish Quarterly Review, 75*(297), 67-73.

Orosz, G., Farkas, D., & Roland-Lévy, C. (2013). Are competition and extrinsic motivation reliable predictors of academic cheating? *Frontiers in psychology, 4*.

Osgood, D. W. (2000). Poisson-based regression analysis of aggregate crime rates. *Journal of Quantitative Criminology, 16*(1), 21-43.

Otsu, Y. (2016). Crime, Search, and Ex-offenders' Accessibility to Labor Markets. *Labour, 30*(4), 393-414.

Ours, J. C., & Vollaard, B. (2016). The Engine Immobiliser: A Non-starter for Car Thieves. *The Economic Journal, 126*(593), 1264-1291.

Ouss, A. (2011). Prison as a school of crime: Evidence from cell-level interactions.

Pager, D. (2003). The mark of a criminal record. *American journal of sociology, 108*(5), 937-975.

Pakistan Bureau of Statistics. (2015) *Household Integrated Economic Survey 2011-12* [Online]. Available from: http://www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2011-12. [Accessed: 12th February 2015].

Pakistan. HRCP & CHRI. (2010) *Police Organizations in Pakistan*. Lahore: HRCP.

Pakistan. Human Rights Commission. (2010) *State of Human Rights in 2010*. Lahore: Human Rights Commission of Pakistan.

Pakistan. National Judicial Committee. (2013) *Annual Report on Administrative Tribunals and Special Courts*. Islamabad: Secretariat, Law & Justice Commission of Pakistan.

Pakistan. National Judicial Committee. (2013) *Judicial Statistics of Pakistan*. Islamabad: Secretariat, Law & Justice Commission of Pakistan.

Pakistan. Transparency International. (2013) *National Corruption Perception Survey.* Karachi: Transparency International, Pakistan.

Pakistan. Transparency International. (2017) *Corruption Perception Index.* Karachi: Transparency International, Pakistan.

Papps, K., & Winkelmann, R. (2000). Unemployment and crime: New evidence for an old question. *New Zealand Economic Papers, 34*(1), 53-71.

Passow, H. J., Mayhew, M. J., Finelli, C. J., Harding, T. S., & Carpenter, D. D. (2006). FACTORS INFLUENCING ENGINEERING STUDENTS'DECISIONS TO CHEAT BY TYPE OF ASSESSMENT. *Research in Higher Education, 47*(6), 643-684.

Paternoster, R., & Simpson, S. (1996). Sanction threats and appeals to morality: Testing a rational choice model of corporate crime. *Law and Society Review*, 549-583.

Pauwels, L., Weerman, F., Bruinsma, G., & Bernasco, W. (2011). Perceived sanction risk, individual propensity and adolescent offending: Assessing key findings from the deterrence literature in a Dutch sample. *European Journal of Criminology, 8*(5), 386-400.

Perkins, D. D., Hughey, J., & Speer, P. W. (2002). Community psychology perspectives on social capital theory and community development practice. *Community Development, 33*(1), 33-52.

Phillips, J., & Land, K. C. (2012). The link between unemployment and crime rate fluctuations: An analysis at the county, state, and national levels. *Social science research, 41*(3), 681-694.

Pickett, J. T., & Roche, S. P. (2016). Arrested development. *Criminology & Public Policy, 15*(3), 727-751.

Pickett, J. T., Loughran, T. A., & Bushway, S. (2016). Consequences of legal risk communication for sanction perception updating and white-collar criminality. *Journal of Experimental Criminology, 12*(1), 75-104.

Piquero, A. R. (2012). *Rational choice and criminal behavior: Recent research and future challenges*: Routledge.

Piquero, A. R., & Hickman, M. (1999). An empirical test of Tittle's control balance theory. *Criminology, 37*(2), 319-342.

Piquero, A. R., & Pogarsky, G. (2002). Beyond Stafford and Warr's reconceptualization of deterrence: Personal and vicarious experiences, impulsivity, and offending behavior. *Journal of Research in Crime and Delinquency, 39*(2), 153-186.

Piquero, A. R., Bouffard, J. A., Piquero, N. L., & Craig, J. M. (2016). Does Morality Condition the Deterrent Effect of Perceived Certainty Among Incarcerated Felons? *Crime & Delinquency, 62*(1), 3-25.

Piquero, A. R., Fagan, J., Mulvey, E. P., Steinberg, L., & Odgers, C. (2005). Developmental trajectories of legal socialization among serious adolescent offenders. *The Journal of criminal law & criminology, 96*(1), 267.

Piquero, A., & Tibbetts, S. (1996). Specifying the direct and indirect effects of low self-control and situational factors in offenders' decision making: Toward a more complete model of rational offending. *Justice Quarterly, 13*(3), 481-510.

Piquero, N. L., & Benson, M. L. (2004). White-collar crime and criminal careers: Specifying a trajectory of punctuated situational offending. *Journal of Contemporary Criminal Justice, 20*(2), 148-165.

Piquero, N. L., Piquero, A. R., & Weisburd, D. (2016). Long-Term Effects of Social and Personal Capital on Offending Trajectories in a Sample of White-Collar Offenders. *Crime & Delinquency, 62*(11), 1510-1527.

Pogarsky, G. (2009). Deterrence and decision making: Research questions and theoretical refinements *Handbook on crime and deviance* (pp. 241-258): Springer.

Pogarsky, G., & Piquero, A. R. (2003). Can punishment encourage offending? Investigating the "resetting" effect. *Journal of Research in Crime and Delinquency, 40*(1), 95-120.

Pogarsky, G., Roche, S. P., & Pickett, J. T. (2017). Heuristics and biases, rational choice, and sanction perceptions. *Criminology, 55*(1), 85-111.

Pratt, T. C., Cullen, F. T., Blevins, K. R., Daigle, L. E., & Madensen, T. D. (2006). The empirical status of deterrence theory: A meta-analysis. *Taking stock: The status of criminological theory, 15*, 367-396.

Prelec, D. (2004). A Bayesian truth serum for subjective data. *Science, 306*(5695), 462-466.

Pryor, A., Dalenberg, D., McCorkle, D., Reardon, J., & Wicks, J. (2008). Buy or burn?: Empirical tests of models of crime using data from a general population. *The Social Science Journal, 45*(1), 95-106.

Psacharopoulos, G., & Patrinos*, H. A. (2004). Returns to investment in education: a further update. *Education economics, 12*(2), 111-134.

Pudney, S., Deadman, D., & Pyle, D. (2000). The relationship between crime, punishment and economic conditions: is reliable inference possible when crimes are under-recorded? *Journal of the Royal Statistical Society: Series A (Statistics in Society), 163*(1), 81-97.

Putnam, R. D. (2000) Bowling Alone: The Collapse and Revival of American Community. New York: Simon & Schuster.

Quinn, J. B., & Hilmer, F. G. (1994). Strategic outsourcing. *Sloan management review, 35*(4), 43.

Rafail, E., & Haque, A. (1999). Relationships between perceived parental acceptance-rejection and juvenile delinquency scores: A study of criminal and non-criminal adolescents. *Pakistan Journal of Psychological Research, 14*(1-2).

Ramakers, A., Apel, R., Nieuwbeerta, P., Dirkzwager, A., & WILSEM, J. (2014). IMPRISONMENT LENGTH AND POST-PRISON EMPLOYMENT PROSPECTS. *Criminology, 52*(3), 399-427.

Raphael, S. (2011). Incarceration and prisoner reentry in the United States. *The ANNALS of the American Academy of Political and Social Science, 635*(1), 192-215.

Raphael, S., & Winter-Ebmer, R. (2001). Identifying the effect of unemployment on crime. *The Journal of Law and Economics, 44*(1), 259-283.

Razzak, J. A., & Luby, S. P. (1998). Estimating deaths and injuries due to road traffic accidents in Karachi, Pakistan, through the capture-recapture method. *International journal of epidemiology, 27*(5), 866-870.

Rehman, R. R., & Waheed, A. (2014). Ethical perception of university students about academic dishonesty in Pakistan: identification of student's dishonest acts. *The Qualitative Report, 19*(4), 1.

Reisig, M. D., & Bain, S. N. (2016). University legitimacy and student compliance with academic dishonesty codes: A partial test of the process-based model of self-regulation. *Criminal Justice and Behavior, 43*(1), 83-101.

Rettinger, D. A., Jordan, A. E., & Peschiera, F. (2004). Evaluating the motivation of other students to cheat: A vignette experiment. *Research in Higher Education, 45*(8), 873-890.

Richard, C., & Lloyd, O. (1960). Delinquency and opportunity: Free Press New York.

Romer, P. M. (1990). Endogenous technological change. *Journal of political Economy, 98*(5, Part 2), S71-S102.

Rosenfeld, R., Baumer, E. P., & Messner, S. F. (2001). Social capital and homicide. *Social Forces, 80*(1), 283-310.

Rosenfeld, R., Fornango, R., & Rengifo, A. F. (2007). The impact of order-maintenance policing on new york city homicide and robbery rates: 1988-2001. *Criminology, 45*(2), 355-384.

Ruhm, C. J. (1995). Economic conditions and alcohol problems. *Journal of health economics, 14*(5), 583-603.

Rummel, R. J. (1994). Power, genocide and mass murder. *Journal of Peace Research, 31*(1), 1-10.

Saana, S. B. B. M., Ablordeppey, E., Mensah, N. J., & Karikari, T. K. (2016). Academic dishonesty in higher education: students' perceptions and involvement in an African institution. *BMC research notes, 9*(1), 234.

Sajid Nazir, M., & Shakeel Aslam, M. (2010). Academic dishonesty and perceptions of Pakistani students. *International Journal of Educational Management, 24*(7), 655-668.

Salahuddin, A. (2014). Crime and Institutional Response: A Study of Mobile Snatching and Street Assaults in Pakistan. *Pakistan Journal of Criminology, 6*(2), 43.

Salkind, N. (1997). Exploring research (3 rd.). *Bartlett, JE, Kotrlik, JW, and Higgins, CC (2001)."Organizational Research: Determining Appropriate sample Size in Survey Research". Information Technology, Learning, and Performance Journal, 19*(1), 43-50.

Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *American journal of sociology, 94*(4), 774-802.

Sampson, R. J., & Raudenbush, S. W. (1999). Systematic social observation of public spaces: A new look at disorder in urban neighborhoods. *American journal of sociology, 105*(3), 603-651.

Sampson, R. J., Laub, J. H., & Wimer, C. (2006). Does marriage reduce crime? A counterfactual approach to within-individual causal effects. *Criminology, 44*(3), 465-508.

Saridakis, G. (2004). Violent crime in the United States of America: a time-series analysis between 1960–2000. *European Journal of Law and Economics, 18*(2), 203-221.

Savolainen, J. (2009). Work, family and criminal desistance: Adult social bonds in a Nordic welfare state. *The British Journal of Criminology, 49*(3), 285-304.

Savolainen, J., Paananen, R., Merikukka, M., Aaltonen, M., & Gissler, M. (2013). Material deprivation or minimal education? Social class and crime in an egalitarian welfare state. *Advances in life course research, 18*(3), 175-184.

Scheff, T. J. (1997). *Emotions, the social bond, and human reality: Part/whole analysis*: Cambridge University Press.

Schepers, D. (2017). Causes of the causes of juvenile delinquency: Social disadvantages in the context of Situational Action Theory. *European Journal of Criminology, 14*(2), 143-159.

Schoepfer, A., Carmichael, S., & Piquero, N. L. (2007). Do perceptions of punishment vary between white-collar and street crimes? *Journal of Criminal Justice, 35*(2), 151-163.

Schoepfer, A., Piquero, N. L., & Langton, L. (2014). Low self-control versus the desire-for-control: An empirical test of white-collar crime and conventional crime. *Deviant Behavior, 35*(3), 197-214.

Schroeder, R. D., & Ford, J. A. (2012). Prescription drug misuse: A test of three competing criminological theories. *Journal of Drug Issues, 42*(1), 4-27.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1-17.

Scott Long, J. (1997). Regression models for categorical and limited dependent variables. *Advanced quantitative techniques in the social sciences, 7*.

Seddig, D. (2016). Crime-Inhibiting, Interactional and Co-Developmental Patterns of School Bonds and the Acceptance of Legal Norms. *Crime & Delinquency, 62*(8), 1046-1071.

Seidman, D., & Couzens, M. (1974). Getting the crime rate down: Political pressure and crime reporting. *Law & Society Review, 8*(3), 457-493.

Sellin, T. (1931). The basis of a crime index. *Am. Inst. Crim. L. & Criminology, 22*, 335.

Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika, 52*(3/4), 591-611.

Shoukry, G. F. (2016). CRIMINALS'RESPONSE TO CHANGING CRIME LUCRE. *Economic Inquiry, 54*(3), 1464-1483.

Sieberg, K. K. (2005). Police. *Criminal Dilemmas: Understanding and Preventing Crime*, 171-180.

Siegel, L. (2016). Criminology: Theories, patterns and typologies. Boston. *USA: Cengage*.

Siennick, S. E., & Osgood, D. W. (2008). A review of research on the impact on crime of transitions to adult roles. *The long view of crime: A synthesis of longitudinal research*, 161-187.

Silberman, M. (1976). Toward a theory of criminal deterrence. *American sociological review*, 442-461.

Silberman, M. (1976). Toward a theory of criminal deterrence. *American sociological review*, 442-461.

Silver, E., & Abell, L. (2016). Beyond harm and fairness: A study of deviance and morality. *Deviant Behavior, 37*(5), 496-508.

Silverman, D. (2004) Street crime and street culture. *International Economic Review*, 45, 761-786.

Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69*(1), 99-118.

Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological review, 63*(2), 129.

Simon, H. A. (1986). Rationality in psychology and economics. *Journal of Business*, S209-S224.

Simons, R. L., & Barr, A. B. (2014). Shifting perspectives: Cognitive changes mediate the impact of romantic relationships on desistance from crime. *Justice Quarterly, 31*(5), 793-821.

Simpson, S. S. (2002). *Corporate crime, law, and social control*: Cambridge University Press.

Simpson, S. S., & Piquero, N. L. (2002). Low self-control, organizational theory, and corporate crime. *Law and Society Review*, 509-548.

Sims, R. L. (1993). The relationship between academic dishonesty and unethical business practices. *Journal of Education for Business, 68*(4), 207-211.

Singh, B. (1973). Making honesty the best policy. *Journal of public economics, 2*(3), 257-263.

Skardhamar, T., Savolainen, J., Aase, K. N., & Lyngstad, T. H. (2015). Does Marriage Reduce Crime? *Crime and Justice, 44*(1), 385-446.

Sloan, F., Eldred, L., McCutchan, S., & Platt, A. (2016). Deterring rearrests for drinking and driving. *Southern Economic Journal, 83*(2), 416-436.

Smith, A. (1776). An Inquiry into the Nature and Causes of the Wealth of Nations, 2 vols. *W. Strahan and T. Cadell.[MTG]*.

Smith, N. C., Simpson, S. S., & Huang, C.-Y. (2007). Why managers fail to do the right thing: An empirical study of unethical and illegal conduct. *Business Ethics Quarterly, 17*(4), 633-667.

Soares, R. R. (2004). Development, crime and punishment: accounting for the international differences in crime rates. *Journal of development economics, 73*(1), 155-184.

Sorgo, A., Vavdi, M., Cigler, U., & Kralj, M. (2015). Opportunity makes the cheater: high school students and academic dishonesty. *CEPS Journal, 5*(4), 67-87.

Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed. *Child development, 63*(5), 1266-1281.

Stolzenberg, L., Eitle, D., & D'Alessio, S. J. (2006). Race, economic inequality, and violent crime. *Journal of Criminal Justice, 34*(3), 303-316.

Stuart, A., Ord, J. K., & Arnold, S. (1999). Kendall's advanced theory of statistics. Vol. 2A: Classical inference and the linear model. *Kendall's advanced theory of statistics. Vol. 2A: Classical inference and the linear model, 6th ed., by A. Stuart, JK Ord, and S. Arnold. 3 volumes London: Hodder Arnold, 1999, 2*.

Suhail, K., & Javed, F. (2004). Psychosocial causes of the crime of murder in Pakistan. *Pakistan Journal of Psychological Research, 19*(3-4).

Sutherland Edwin, H., & Cressey Donald, R. (1947). Principles of criminology: Philadelphia: Lippincott.

Sutherland, E. H. (1939) Principles of Criminology. Chocago, Philadelphia: J. B. Lippincott Company.

Svensson, R. (2015). An examination of the interaction between morality and deterrence in offending: A research note. *Crime & Delinquency, 61*(1), 3-18.

Svensson, R., Pauwels, L. J., Weerman, F. M., & Bruinsma, G. J. (2017). Explaining individual changes in moral values and moral emotions among adolescent boys and girls: A fixed-effects analysis. *European Journal of Criminology, 14*(3), 290-308.

Swisher, R. R., & Dennison, C. R. (2016). Educational Pathways and Change in Crime Between Adolescence and Early Adulthood. *Journal of Research in Crime and Delinquency, 53*(6), 840-871.

Tahir, M. W., Kauser, R., Tousif, S., Nazir, M. A., Arshad, A., & Butt, A. (2011). Crime trends among youth (15-29) in Gujrat, Pakistan. *African Journal of Law and Criminology, 1*(2), 39-49.

Tannenbaum, F. (1938). *Crime and the Community*: JSTOR.

Tarde, G. (1962). The laws of imitation, trans. *R. Howell. Montclair, NJ: Patterson Smith*.

Tauchen, H., & Witte, A. D. (1994). *Work and crime: An exploration using panel data*: National Bureau of Economic Research.

Taylor, J. B. (1978). Econometric models of criminal behavior: A review. *Economic Model of Criminal Behavior, North-Holland Publishing, New York*.

Taylor, R. B. (2001). *Breaking away from broken windows: Baltimore neighborhoods and the nationwide fight against crime, grime, fear, and decline*: Westview Press Boulder, CO.

Taylor, R. B. (2001). The ecology of crime, fear, and delinquency: Social disorganization versus social efficacy. *Explaining criminals and crime*, 124-139.

Taylor, S. P., & Leonard, K. E. (1983). Alcohol and human physical aggression. *Aggression: Theoretical and empirical reviews, 2*, 77-101.

Tengpongsthorn, W. (2017). Factors affecting the effectiveness of police performance in Metropolitan Police Bureau. *Kasetsart Journal of Social Sciences, 38*(1), 39-44.

Thomas, D. (2017). Factors That Explain Academic Dishonesty Among University Students in Thailand. *Ethics & Behavior, 27*(2), 140-154.

Thornberry, T. P., & Krohn, M. D. (2000). The self-report method for measuring delinquency and crime. *Criminal justice, 4*(1), 33-83.

Thornberry, T. P., Moore, M., & Christenson, R. (1985). The effect of dropping out of high school on subsequent criminal behavior. *Criminology, 23*(1), 3-18.

Tilley, N. (2009) Crime Prevention. United Kingdom: Willan Publishing.

Tilley, N., Thompson, R., Farrell, G., Grove, L., & Tseloni, A. (2015). Do burglar alarms increase burglary risk? A counter-intuitive finding and possible explanations. *Crime Prevention and Community Safety, 17*(1), 1-19.

Tittle, C. R. (1975). Deterrents or labeling? *Social Forces, 53*(3), 399-410.

Tittle, C. R. (1995). *Control balance: Toward a general theory of deviance*: Westview Press Boulder, CO.

Toby, J. (1957). Social disorganization and stake in conformity: Complementary factors in the predatory behavior of hoodlums. *J. Crim. L. Criminology & Police Sci., 48*, 12.

Topalli, V. (2005). Criminal expertise and offender decision-making: An experimental analysis of how offenders and non-offenders differentially perceive social stimuli. *The British Journal of Criminology, 45*(3), 269-295.

Travaglini, G. (2003). Property Crime and Law Enforcement in Italy. A Regional Panel Analysis 1980-95. *Giornale degli Economisti e Annali di Economia*, 211-240.

Travis, H. (1969). Causes of Delinquency. *Berkeley, CA: University of California*.

Trumbull, W. N. (1989). Estimations of the economic model of crime using aggregate and individual level data. *Southern Economic Journal*, 423-439.

Tseloni, A., Thompson, R., Grove, L., Tilley, N., & Farrell, G. (2017). The effectiveness of burglary security devices. *Security Journal, 30*(2), 646-664.

Turner, C., & Lessler, J. Devore, 1992. Effects of mode of administration and wording on reporting of drug use. *Survey Measurements of Drug Abuse: Methodological Studies. National Institute on Drug Abuse, US Department of Health and Human Services, US Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC*, 20402-29328.

Uggen, C. (2000). Work as a turning point in the life course of criminals: A duration model of age, employment, and recidivism. *American sociological review*, 529-546.

Uggen, C., & Kruttschnitt, C. (1998). Crime in the breaking: Gender differences in desistance. *Law and Society Review*, 339-366.

Uggen, C., & Thompson, M. (2003). The socioeconomic determinants of ill-gotten gains: Within-person changes in drug use and illegal earnings. *American journal of sociology, 109*(1), 146-185.

Uggen, C., & Wakefield, S. (2008). What have we learned from longitudinal studies of work and crime? *The long view of crime: A synthesis of longitudinal research* (pp. 191-219): Springer.

United Kingdom. BMI Research (2017) Pakistan Crime and Security Risk Report. London: Business Monitor International.

United Kingdom. Institute for Criminal Policy Research (2017) World Prison Brief. [Available at; http://www.prisonstudies.org/country/pakistan, accessed at; 01/08/2017].

United States Department of State. (2015) *Pakistan 2015 OSAC Crime and Safety Report*. Lahore: Bureau of Diplomatic Security.

United States Department of State. (2017) *Pakistan 2017 OSAC Crime and Safety Report*. Lahore: Bureau of Diplomatic Security.

United States. Institute for Economic & Peace. (2016) *Global Peace Index*. New York. (9th edition).

United States. Institute for Economic & Peace. (2017) *Global Terrorism Index*. New York.

United States. Institute for Social Policy and Understanding. (2009) *Police & Law Enforcement Reforms in Pakistan: Crucial for Counterinsurgency and Counterterrorism Success*. Michigan: Institute for Social Policy and Understanding.

United States: United States Institute of Peace (2011) *Reforming Pakistan's Police and Law Enforcement Infrastructure: Is it too Flawed to Fix?* Washington: United States Institute of Peace. (Special Report 266).

Usher, D. (1997). Education as a Deterrent to Crime. *Canadian Journal of Economics*, 367-384.

Valdimarsdóttir, M., & Bernburg, J. G. (2015). Community disadvantage, parental network, and commitment to social norms: Multilevel study of self-reported delinquency in Iceland. *Journal of Research in Crime and Delinquency, 52*(2), 213-244.

Van der Geest, V. R., Bijleveld, C. C., & Blokland, A. A. (2011). The effects of employment on longitudinal trajectories of offending: A follow-up of high-risk youth from 18 to 32 years of age. *Criminology, 49*(4), 1195-1234.

Verbruggen, J., Apel, R., Van der Geest, V. R., & Blokland, A. A. (2015). Work, income support, and crime in the Dutch welfare state: a longitudinal study following vulnerable youth into adulthood. *Criminology, 53*(4), 545-570.

Vieraitis, L. M., Piquero, N. L., Piquero, A. R., Tibbetts, S. G., & Blankenship, M. (2012). Do women and men differ in their neutralizations of corporate crime? *Criminal Justice Review, 37*(4), 478-493.

Viscusi, W. K. (1986). The risks and rewards of criminal activity: a comprehensive test of criminal deterrence. *Journal of Labor Economics, 4*(3, Part 1), 317-340.

Visher, C. A., & Travis, J. (2011). Life on the outside: Returning home after incarceration. *The Prison Journal, 91*(3_suppl), 102S-119S.

Visher, C. A., Debus-Sherrill, S. A., & Yahner, J. (2011). Employment after prison: A longitudinal study of former prisoners. *Justice Quarterly, 28*(5), 698-718.

Wadsworth, T. (2006). The meaning of work: Conceptualizing the deterrent effect of employment on crime among young adults. *Sociological Perspectives, 49*(3), 343-368.

Wakefield, S., & Uggen, C. (2010). Incarceration and stratification. *Annual review of sociology, 36*, 387-406.

Walker, J. (2010). Measuring plagiarism: Researching what students do, not what they say they do. *Studies in Higher Education, 35*(1), 41-59.

Wallerstein, J. S., & Wyle, C. J. (1947). Our law-abiding law-breakers. *Probation*.

Walters, G. D. (2016). Crime continuity and psychological inertia: Testing the cognitive mediation and additive postulates with male adjudicated delinquents. *Journal of Quantitative Criminology, 32*(2), 237-252.

Weatherburn, D., Halstead, I., & Ramsey, S. (2016). The great (Australian) property crime decline. *Australian Journal of Social Issues, 51*(3), 257-278.

Welsh, B. C., Braga, A. A., & Bruinsma, G. J. (2015). Reimagining broken windows: From theory to policy. *Journal of Research in Crime and Delinquency, 52*(4), 447-463.

Welsh, B., Farrington, D. P., & Sherman, L. W. (2001). *Costs and benefits of preventing crime*: Westview Press Boulder, CO.

Western, B. (2002). The impact of incarceration on wage mobility and inequality. *American sociological review*, 526-546.

Whitley, B. E. (1998). Factors associated with cheating among college students: A review. *Research in Higher Education, 39*(3), 235-274.

Wiesner, M., Capaldi, D. M., & Kim, H. K. (2007). Arrest trajectories across a 17-year span for young men: Relation to dual taxonomies and self-reported offense trajectories. *Criminology, 45*(4), 835-863.

Wikström, P.-O. H. (2004). Crime as alternative: Towards a cross-level situational action theory of crime causation. *Beyond empiricism: Institutions and intentions in the study of crime, 13*, 1-37.

Wikström, P.-O. H. (2006). Individuals, settings, and acts of crime: Situational mechanisms and the explanation of crime. *The explanation of crime: Context, mechanisms and development*, 61-107.

Wikström, P.-O. H. (2010). Explaining crime as moral actions *Handbook of the Sociology of Morality* (pp. 211-239): Springer.

Williams, J., & Sickles, R. C. (2002). An analysis of the crime as work model: Evidence from the 1958 Philadelphia birth cohort study. *Journal of Human Resources*, 479-509.

Wilson, J. Q., & Kelling, G. L. (1982). Broken windows. *Atlantic monthly, 249*(3), 29-38.

Winter, H. (2008). *The economics of crime: an introduction to rational crime analysis*: Routledge.

Witte, A. D. (1980). Estimating the economic model of crime with individual data. *The Quarterly Journal of Economics, 94*(1), 57-84.

Wolff, K. T., Baglivio, M. T., & Piquero, A. R. (2017). The relationship between adverse childhood experiences and recidivism in a sample of juvenile offenders in community-based treatment. *International Journal of Offender Therapy and Comparative Criminology, 61*(11), 1210-1242.

Wright, R. T., & Decker, S. H. (1994). *Burglars on the job: Streetlife and residential break-ins*: UPNE.

Wright, R., & Decker, S. H. (1997). Creating the Illusion of Impending death--Armed Robbers in Action. *Harry Frank Guggenheim Review, 2*, 10-18.

Yamamura, E. (2009). Formal and informal deterrents of crime in Japan: Roles of police and social capital revisited. *The Journal of Socio-Economics, 38*(4), 611-621.

Yuksek, D. A., & Solakoglu, O. (2016). The relative influence of parental attachment, peer attachment, school attachment, and school alienation on delinquency among high school students in Turkey. *Deviant Behavior, 37*(7), 723-747.

Zafar, A., Asim, M., Malik, N., & Zafar, M. I. (2013). Socio-Culture Factors Responsible for Crimes Committed by Females of Adiala Jail, Rawalpindi, Pakistan. *Academic Journal of Interdisciplinary Studies, 2*(1), 373.

Zaidi, S. M. A. (2008). A Profile of Mangal Bagh. *The Long War Journal, 11*.

Zhang, J. (1997). The effect of welfare programs on criminal behavior: A theoretical and empirical analysis. *Economic Inquiry, 35*(1), 120-137.

Zimring, F. E., & Hawkins, G. (1973). *Deterrence; The legal threat in crime control*: Chicago: University of Chicago Press.

Zimring, F., & Hawkins, G. (1995). *Incapacitation: Penal confinement and the restraint of crime*: Oxford University Press.

Zoutewelle-Terovan, M., & Skardhamar, T. (2016). Timing of Change in Criminal Offending Around Entrance into Parenthood: Gender and Cross-Country Comparisons for At-Risk Individuals. *Journal of Quantitative Criminology, 32*(4), 695-722.

Zuckerman, M., Kuhlman, D. M., Joireman, J., Teta, P., & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternative Five. *Journal of personality and social psychology, 65*(4), 757.

Appendices

Appendix 01: Number of police stations and chowkies in Pakistan

Province	Division/Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
KP	Peshwar	55	54	52	51	51	51	51	52	53	53
	Mardan	21	21	25	25	25	25	28	24	27	27
	Kohat	21	21	21	25	25	26	25	25	25	25
	DI Khan	15	15	16	17	17	17	17	19	19	19
	Bannu	18	18	18	19	19	19	19	19	19	19
	Hazara	45	47	43	50	53	53	54	53	53	54
	Malakand	39	39	61	62	62	71	71	75	75	76
Punjab	Rawalpindi	60	61	61	61	66	66	66	66	66	66
	Bahawalpur	67	67	69	69	72	72	72	72	69	72
	DG Khan	55	55	55	58	62	63	63	57	63	63
	Multan	95	96	97	99	105	105	105	106	107	107
	Lahore	126	126	127	128	134	140	137	138	138	138
	Gujranwala	105	109	109	111	114	109	114	114	114	119
	Faisalabad	64	65	57	61	65	65	74	74	74	74
	Sargodha	59	59	60	60	65	66	66	66	66	66
Sindh	Sukkur	104	128	128	129	139	136	143	145	146	147
	Larkana	73	74	74	76	76	79	84	92	92	90
	Hyderabad	116	123	131	132	136	148	148	147	147	149
	Mirpur Khas	46	46	46	46	46	54	60	51	60	63
	Karachi	97	69	96	107	105	94	110	117	120	113
Balochistan	Quetta	22	31	31	24	21	25	25	25	28	28
	Zhob	8	23	27	11	11	17	17	17	17	17
	Sibi	18	29	26	8	8	7	8	8	9	9
	Nasirabad	34	36	36	40	32	33	32	32	32	32
	Kalat	39	44	44	23	23	23	23	23	24	23
	Makran	18	18	19	7	7	6	6	6	7	11
Islamabad	Capital territory	15	15	15	14	17	18	19	19	22	22

Appendix 02: Problems created by measurement errors in crime rate

Suppose, for simplicity, that we want to estimate a bi-variate supply of offences equation. Defining the dependent variable as reported crime (C) per certain number of population (N), and the only explanatory variable as a ratio of arrests (A) to reported crime (C), the equation can be specified as (conventionally, supply of offence equation is specified in the log form);

$$\ln\left(\frac{C}{N}\right) = \beta \ln\left(\frac{A}{C}\right) + u \quad (1)$$

where u is a random disturbance. Letting lower case letters represent the logarithms of the variables and subscripts to indicate observations, equation (1) becomes;

$$c_i - n_i = \beta(a_i - c_i) + u_i \quad (2)$$

If c is measured with error ε, the OLS estimate of β is given by;

$$\hat{\beta} = \frac{\sum_i (a_i - c_i - \varepsilon_i)(c_i + \varepsilon_i - n_i)}{\sum_i (a_i - c_i - \varepsilon_i)2} \quad (3)$$

Which after substitution of $c_i - n_i$ from 2 can be shown to converge stochastically to;

$$\frac{\beta M - \sigma^2}{M + \sigma^2} \quad (4)$$

Where M is the average of $(a_i - c_i)^2$ in the limit, and σ^2 is the variance of ε. Except for the special case where the true value of the elasticity β is equal to -1, (4) will not equal to β when there is measurement error. Hence, β hat will not be a consistent estimator of β.

Appendix 03: List of crime inventories in the three questionnaires

Students	Employees	Ex-inmates
Copying answers from other students or materials during exams	Plagiarized a research paper (or other research document)	Murder
Impersonation	Falsified information on a research paper (or other research document)	Bribed someone
Getting advance copies of an exam	providing advance copies of an exam to favored students	Domestic violence
Lied to a teacher about missing an exam	Shirking	Ransom (kidnapping)
Eating/drinking from a cafeteria/canteen without paying the proper price	Misuse of authority	Deceit
Using public property illegally (e.g. residing in hostel without allotment)	Using public property illegally	Shot or shot at someone
Misuse/damaged public property (i.e. water, electricity, internet etc)	Misuse/damaged public property (i.e. water, electricity, internet etc)	Robbery
Flattering the teachers or any other employee	Nepotism	Forcible sex
Assault	Assault	Assault

Intimidation	Intimidation	Intimidation
Forgery	Forgery	Tortured someone
Theft of any type	Theft of any type	Theft of any type
Swindle	Swindle	Blackmailing/extortion
Blackmailing/extortion	Blackmailing/extortion	Buying, selling, possession or consumption of illegal drugs
Bribery	Bribery	Holding a weapon without license
Buying, selling, possession or consumption of illegal drugs	Buying, selling, possession or consumption of illegal drugs	Bought, received, or sold stolen goods
Holding a weapon without license	Holding a weapon without license	Participated in a fight
Graffiti on walls, toilets, or other public places	Moral corruption	
Over speeding	Embezzlement	
Designing and using fake IDs	Public corruption	
Driving without license	Driving without license	
Bought, received, or sold stolen goods	Bought, received, or sold stolen goods	
Participated in a fight	Participated in a fight	
Got into a cinema or other facility (e.g. bus etc) without paying proper fee	Fraud/deceit	
Doing acts parents would not permit	Forcible fondling	
Viewing porn videos	Pulling sickies	
Forcible fondling		

Appendix 04: Some Basic Frequencies of the three Sub-Samples

Variables	Categories	Sub-Samples		
		Students	Ex-Inmates	Employees
Sex	Male	71	100	93
	Female	29	0	07
Marital Status	Single	92	42	46
	Married	8	58	54
Residence	Rural	79	86	72
	Urban	21	14	28
Parents Education	Both Parents Educated	31	5	17
	Otherwise	69	95	83

Note: Results are rounded to the nearest whole number.

Appendix 05: Important Descriptive Statistics of the Students' Sample

Variables	Min	Max	Mean	St. Dev	Skewness
Age of the Respondent	15	40	21.77	3.05	2.13
Education of the Respondent	14	23	14.51	1.81	-0.29
Family Size	2	60	8.69	4.85	4.79
Total Self-Reported Offending	0	27	6.41	6.14	1.14
Academic Dishonesty	0	7	1.76	1.83	1.14
Campus crimes	0	7	1.53	1.84	1.21
Other Crimes	0	8	2.23	2.16	0.82
Estimate about crimes reported to Police	01	100	53.68	23.55	-0.38
Estimate about crimes cleared by the Police	0	100	36.20	22.94	0.51
Perceived Probability of Detection (PPD)	13	78	39.46	16.32	0.214
Perceived Probability of Legal Sanctions (PPLS)	0	78	39.70	14.93	0.13
Perceived Severity of Legal Sanctions (PSLS)	0	78	53.14	15.35	-0.57
Perceived Probability of Social Sanctions (PPSS)	0	78	46.95	15.64	-0.24
Perceived Severity of Social Sanctions (PSSS)	0	78	54.88	15.64	-0.54
Perceived Probability of Personal Sanctions (PPPS)	0	78	51.93	18.26	-0.32
Perceived Severity of Personal Sanctions (PSPS)	0	78	52.57	15.82	-0.40
Parenting Scale (PS) [Human Capital-1]	29	105	78.08	13.96	-0.45
School Attachment Scale (SAS) [Human Capital-2]	0	40	25.52	8.17	-0.23
Activity Scale (ACS) [Human Capital-3]	6	42	28.73	7.80	-0.68
Time Preference (TP) [Human Capital-4]	4	23	13.52	3.62	-0.32
Risk Preference (RP) [Human Capital-5]	3	15	9.27	2.89	-0.41
Peer's Behavior (PeeE) [Social Capital-1]	8	42	20.13	7.21	0.26
Social Capital (SCap) [Social Capital-2]	21	75	51.43	9.39	-0.03
Morality Scale (MS)	0	150	97.02	17.71	-1.32
Discrimination Scale (DS)	0	55	24.04	10.94	0.31
Awareness about Criminal Justice System (ACJS)	5	32	12.91	6.91	0.64
Socio-Economic Status (SES)	34	128	87	18	-0.04

Note: The probability measures are normalized such that the lowest value corresponds to zero and the highest to one.

Appendix 06: Important Descriptive Statistics of the Ex-Inmates' Sample

Variables	Min	Max	Mean	St. Dev	Skewness
Age of the Respondent	14	66	31.60	10.62	0.68
Education of the Respondent	0	18	8.54	5.59	-0.41
Family Size	1	25	6.69	2.85	1.88
Total Self-Reported Offending	0	17	3.48	2.86	1.32
Violent Crimes	0	11	1.65	1.77	1.62
Property Crimes	0	4	1.19	1.07	0.68
Other Crimes	0	2	0.63	0.73	0.70
Estimate about crimes reported to Police	0	100	56.61	26.12	-0.29
Estimate about crimes cleared by the Police	0	95	33.31	23.12	0.34
Perceived Probability of Detection (PPD)	0	93	61.72	14.41	-0.86
Perceived Probability of Legal Sanctions (PPLS)	0	96	60.16	14.61	-0.47
Perceived Severity of Legal Sanctions (PSLS)	0	96	63.65	13.47	-1.47
Perceived Probability of Social Sanctions (PPSS)	0	96	60.32	12.94	-0.98
Perceived Severity of Social Sanctions (PSSS)	0	96	62.14	14.15	-1.27
Perceived Probability of Personal Sanctions (PPPS)	0	96	61.26	15.76	-0.62
Perceived Severity of Personal Sanctions (PSPS)	0	96	62.29	16.13	-1.02
Parenting Scale (PS) [Human Capital-1]	0	115	75.92	14.09	-1.62
School Attachment Scale (SAS) [Human Capital-2]	0	45	24.88	12.78	-0.94
Activity Scale (ACS) [Human Capital-3]	0	71	49.97	10.66	-0.25
Time Preference (TP) [Human Capital-4]	0	30	18.46	3.73	-0.98
Risk Preference (RP) [Human Capital-5]	0	30	17.38	3.59	-0.94
Peer's Behavior (PeeE) [Social Capital-1]	10	41	18.71	6.80	0.89
Social Capital (SCap) [Social Capital-2]	0	129	48.34	14.74	-0.55
Morality Scale (MS)	0	117	70.48	13.31	-0.99
Discrimination Scale (DS)	0	56	21.45	11.81	0.34
Awareness about Criminal Justice System (ACJS)	0	39	18.61	8.12	0.47
Socio-Economic Status (SES)	0	124	77.10	17.83	-0.50

Appendix 07: Important Descriptive Statistics of the University Employees' Sample

Variables	Min	Max	Mean	St. Dev	Skewness
Age of the Respondent	23	60	31.79	7.66	1.26
Education of the Respondent	12	24	16.19	2.14	-0.89
Family Size	2	30	7.45	3.57	1.67
Total Self-Reported Offending	0	21	4.24	4.66	1.35
Academic Dishonesty	0	3	0.46	0.79	1.69
White-Collar Crimes	0	13	2.75	3.23	1.39
Other Crimes	0	5	1.04	1.34	1.41
Estimate about crimes reported to Police	0	100	51.93	23.79	-0.18
Estimate about crimes cleared by the Police	0	100	36.08	23.05	0.48
Perceived Probability of Detection (PPD)	14	84	46.50	18.17	0.07
Perceived Probability of Legal Sanctions (PPLS)	0	84	55.42	17.91	-0.26
Perceived Severity of Legal Sanctions (PSLS)	0	84	58.48	18.67	-0.72
Perceived Probability of Social Sanctions (PPSS)	0	84	53.05	19.42	-0.35
Perceived Severity of Social Sanctions (PSSS)	0	84	62.28	17.05	-0.88
Perceived Probability of Personal Sanctions (PPPS)	0	84	62.64	20.33	-0.95
Perceived Severity of Personal Sanctions (PSPS)	0	84	61.56	17.16	-0.88
Parenting Scale (PS) [Human Capital-1]	0	105	78.43	16.71	-1.13
School Attachment Scale (SAS) [Human Capital-2]	0	40	28.79	7.64	-0.76
Activity Scale (ACS) [Human Capital-3]	13	71	49.97	10.66	-0.33
Time Preference (TP) [Human Capital-4]	4	20	12.60	3.65	-0.05
Risk Preference (RP) [Human Capital-5]	0	15	8.57	2.92	-0.03
Peer's Behavior (PeeE) [Social Capital-1]	11	44	23.01	8.16	0.32
Social Capital (SCap) [Social Capital-2]	0	90	52.31	11.65	-0.58
Morality Scale (MS)	0	126	84.69	17.31	-1.44
Discrimination Scale (DS)	0	56	23.15	10.76	0.42
Awareness about Criminal Justice System (ACJS)	0	35	12.79	7.21	0.89
Socio-Economic Status (SES)	0	132	84.74	20.01	-0.07

Appendix 08: Additional Regression Results based on the Students' Sample

Appendix 8.1: Regression Results of Total Self-Reported Offending [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.045 (.402)	.956	-.005 (.854)	.995	.026 (.558)
(PPLS)	-.037 (.488)	.964	-.005 (.829)	.995	-.007 (.881)
(PSLS)	.116 (.056)	1.123	.109 (.000)	1.115	.132 (.010)
(PPSS)	-.034 (.536)	.967	-.021 (.405)	.979	-.002 (.958)
(PSSS)	.075 (.217)	1.078	.041 (.138)	1.041	.097 (.053)
(PPPS)	-.184 (.001)	.832	-.187 (.000)	.829	-.144 (.002)
(PSPS)	-.253 (.000)	.777	-.224 (.000)	.799	-.222 (.000)
(PS)	.010 (.851)	1.010	.008 (.736)	1.008	-.036 (.427)
(SAS)	-.071 (.203)	.932	-.093 (.000)	.911	-.086 (.052)
(ACS)	-.222 (.000)	.801	-.209 (.000)	.811	-.171 (.000)
(TP)	.036 (.428)	1.036	.045 (.046)	1.047	.041 (.310)
(RP)	.099 (.038)	1.036	.060 (.011)	1.062	.051 (.229)
(PeeE)	.230 (.000)	1.259	.191 (.000)	1.211	.188 (.000)
(SCap)	.073 (.084)	1.076	.058 (.005)	1.059	.078 (.051)
(MS)	-.040 (.391)	.961	-.051 (.036)	.950	-.021 (.621)
(DS)	.054 (.306)	.961	.065 (.009)	1.068	.118 (.014)
(ACJS)	.100 (.051)	1.105	.107 (.000)	1.113	.148 (.002)
(SES)	-.087 (.082)	.917	-.066 (.006)	.936	-.045 (.308)
(PE)	.075 (.452)	1.078	.013 (.766)	1.013	.013 (.758)
(II)	-.027 (.434)	.973	-.045 (.005)	.952	-.058 (.145)
Intercept	1.621 (.000)	5.057	1.677 (.000)	5.348	
Value/df	1.260		3.919		
AIC	2349.180		2887.680		
BIC	2438.170		2972.626		
LR χ^2	172.799 (.000)		894.209 (.000)		
Disp. P	.519				

Appendix 8.2: Regression Results of Academic Dishonesty [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.051 (.320)	.950	-.036 (.438)	.965	.000 (.999)
(PPLS)	.031 (.522)	1.032	.033 (.465)	1.033	.020 (.657)
(PSLS)	.032 (.570)	1.033	.033 (.526)	1.033	.073 (.140)
(PPSS)	.074 (.144)	1.077	.067 (.133)	1.070	.043 (.348)
(PSSS)	.014 (.780)	1.014	.010 (.827)	1.010	.020 (.677)
(PPPS)	-.205 (.000)	.815	-.208 (.000)	.812	-.158 (.001)

(PSPS)	-.146 (.011)	.864	-.136 (.008)	.873	-.105 (.038)
(PS)	-.024 (.638)	.976	-.026 (.592)	.975	-.060 (.197)
(SAS)	-.045 (.394)	.956	-.047 (.330)	.954	-.034 (.460)
(ACS)	-.174 (.001)	.840	-.170 (.000)	.844	-.131 (.004)
(TP)	.101 (.572)	1.027	.026 (.577)	1.026	.023 (.589)
(RP)	.101 (.040)	1.107	.104 (.022)	1.110	.085 (.048)
(PeeE)	.232 (.000)	1.261	.220 (.000)	1.246	.227 (.000)
(SCap)	.078 (.073)	1.081	.076(055)	1.079	.000 (.999)
(MS)	.024 (.641)	1.024	.023 (.618)	1.024	.063 (.152)
(DS)	-.009 (.866)	.991	-.006 (.900)	.994	.049 (.303)
(ACJS)	.162 (.001)	1.176	.162 (.900)	.994	.178 (.000)
(SES)	-.059 (.253)	.942	-.061 (.198)	.941	-.056 (.223)
(PE)	-.047 (.628)	.945	-.027 (.750)	.973	.017 (.691)
(II)	-.067 (.072)	.935	-.070 (.027)	.932	-.069 (.089)
Intercept	.402 (.000)	1.495	.398 (.000)	1.489	
Value/df	1.191		1.372		
AIC	1384.541		1388.456		
BIC	1473.583		1473.451		
LR χ^2	166.40 (.000)		256.978 (.000)		
Disp. P	.106				

Appendix 8.3: Regression Results of Campus Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.008 (.905)	.992	.002 (.967)	1.002	.038 (.407)
(PPLS)	-.051 (.428)	.951	-.029 (.557)	.972	-.050 (.264)
(PSLS)	.021 (.785)	1.021	.009 (.881)	1.009	.069 (.186)
(PPSS)	-.149 (.029)	.861	-.118 (.016)	.889	-.013 (.781)
(PSSS)	.070 (.371)	1.072	.042 (.454)	1.042	.105 (.042)
(PPPS)	-.151 (.032)	.860	-.141 (.007)	.868	-.145 (.002)
(PSPS)	-.240 (.002)	.787	-.204 (.000)	.815	-.165 (.001)
(PS)	.040 (.533)	1.041	.042 (.413)	1.043	.020 (.676)
(SAS)	-.149 (.033)	.862	-.158 (.002)	.854	-.066 (.155)
(ACS)	-.291 (.000)	.748	-.254 (.000)	.776	-.162 (.001)
(TP)	.024 (.685)	1.025	.023 (.618)	1.024	.056 (.197)
(RP)	.052 (.415)	1.053	.043 (.379)	1.044	.013 (.775)
(PeeE)	.167 (.009)	1.182	.154 (.001)	1.167	.209 (.000)
(SCap)	.080 (.138)	1.083	.074 (.079)	1.077	.024 (.566)
(MS)	.007 (.906)	1.007	.013 (.800)	1.013	-.091 (.049)
(DS)	.143 (.032)	1.154	.150 (.003)	1.162	.110 (.031)
(ACJS)	.139 (.028)	1.149	.152 (.001)	1.164	.081 (.104)
(SES)	-.067 (.302)	.935	-.058 (.252)	.944	-.041 (.390)
(PE)	-.090 (.477)	.914	-.061 (.506)	.941	-.001 (.991)

(II)	-.041 (.390)	.960	-.055 (.121)	.947	-.050 (.247)
Intercept	.210 (.002)	1.234	.215 (.000)	1.240	
Value/df	1.148		1.675		
AIC	1337.097		1376.502		
BIC	1426.088		1461.447		
LR χ^2	141.107 (.000)		278.562 (.000)		
Disp. P	.397				

Appendix 8.4: Regression Results of Other Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	.003 (.961)	1.003	.009 (.826)	1.009	.039 (.393)
(PPLS)	-.088 (.081)	.916	-.077 (.046)	.925	-.040 (.385)
(PSLS)	.096 (.101)	1.101	.093 (.042)	1.098	.064 (.222)
(PPSS)	-.051 (.329)	.951	-.044 (.263)	.957	-.053 (.240)
(PSSS)	.067 (.240)	1.070	.061 (.167)	1.063	.100 (.060)
(PPPS)	-.204 (.000)	.815	-.200 (.000)	.819	-.108 (.023)
(PSPS)	-.163 (.004)	.850	-.163 (.000)	.849	-.180 (.001)
(PS)	.044 (.385)	1.045	.052 (.199)	1.053	-.025 (.606)
(SAS)	-.084 (.110)	.920	-.097 (.015)	.908	-.100 (.030)
(ACS)	-.210 (.000)	.810	-.212 (.000)	.809	-.178 (.000)
(TP)	.067 (.162)	1.069	.075 (.048)	1.078	.028 (.505)
(RP)	.039 (.425)	1.040	.018 (.641)	1.018	.008 (.862)
(PeeE)	.232 (.000)	1.261	.218 (.000)	1.243	.107 (.021)
(SCap)	.033 (.463)	1.033	.024 (.486)	1.024	.097 (.020)
(MS)	-.106 (.035)	.899	-.122 (.002)	.885	.028 (.541)
(DS)	.071 (.194)	1.073	.069 (.096)	1.072	.148 (.003)
(ACJS)	.054 (.291)	1.056	.066 (.082)	1.069	.158 (.001)
(SES)	-.055 (.282)	.947	-.046 (.240)	.955	-.023 (.616)
(PE)	-.057 (.571)	.945	-.044 (.570)	.957	-.003 (.943)
(II)	-.034 (.352)	.966	-.049 (.102)	.952	-.049 (.237)
Intercept	.674 (.000)	1.962	.673 (.000)	1.959	
Value/df	1.262		1.796		
AIC	1598.615		1635.341		
BIC	1687.709		1720.386		
LR χ^2	136.715 (.000)		268.230 (.000)		
Disp. P	.264				

Appendix 8.5: Regression Results of Total Self-Reported Offending [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.009 (.127)	.991	-.004 (.165)	.996	.025 (.574)
(PPLS)	-.007 (.259)	.993	-.004 (.209)	.966	.001 (.987)
(PSLS)	.013 (.053)	1.013	.013 (.000)	1.013	.124 (.015)
(PPSS)	-.003 (.655)	.997	-.004 (.236)	.966	-.008 (.853)
(PSSS)	.009 (.136)	1.009	.007 (.025)	1.007	.114 (.025)
(PPPS)	-.015 (.005)	.985	-.016 (.000)	.984	-.146 (.001)
(PSPS)	-.025 (.000)	.975	-.023 (.000)	.977	-.222 (.000)
(PS)	.004 (.592)	1.004	.005 (.183)	1.005	-.031 (.495)
(SAS)	-.011 (.377)	.989	-.016 (.008)	.984	-.095 (.030)
(ACS)	-.066 (.000)	.936	-.063 (.000)	.939	-.209 (.000)
(TP)	.024 (.158)	1.024	.020 (.030)	1.020	.035 (.387)
(RP)	.040 (.057)	1.041	.028 (.013)	1.028	.050 (.232)
(PeeE)	.043 (.000)	1.044	.035 (.000)	1.036	.186 (.000)
(SCap)	.012 (.040)	.040	.008 (.010)	1.008	.075 (.060)
(MS)	.004 (.309)	1.004	.003 (.207)	1.003	.007 (.864)
(DS)	.014 (.153)	1.014	.014 (.003)	1.014	.126 (.009)
(ACJS)	.022 (.117)	1.022	.023 (.000)	1.024	.129 (.006)
(SES)	-.008 (.143)	.992	-.008 (.005)	.992	-.034 (.444)
(PE)	-.064 (.512)	.938	.000 (.992)	1.00	.002 (.966)
(II)	-.038 (.320)	.963	-.061 (.001)	.941	-.064 (.101)
Intercept	1.659 (.000)	5.252	1.654 (.000)	5.227	
Value/df	1.271		3.597		
AIC	2101.108		2500.442		
BIC	2187.965		2583.351		
LR χ^2	175.604 (.000)		848.355 (.000)		
Disp. P	.454				

Appendix 8.6: Regression Results of Academic Dishonesty [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.027 (.198)	.973	-.023 (.242)	.978	.002 (.970)
(PPLS)	.010 (.627)	1.010	.012 (.545)	1.012	.028 (.521)
(PSLS)	.020 (.377)	1.020	.012 (.545)	1.012	.059 (.241)
(PPSS)	.019 (.360)	1.019	.016 (.389)	1.016	.036 (.426)
(PSSS)	.013 (.512)	1.013	.012 (.483)	1.013	.031 (.517)
(PPPS)	-.079 (.000)	.924	-.080 (.000)	.923	-.159 (.001)
(PSPS)	-.045 (.046)	.956	-.044 (.035)	.957	-.101 (.052)
(PS)	-.005 (.473)	.995	-.005 (.450)	.955	-.056 (.230)
(SAS)	-.001 (.967)	.999	-.001 (.966)	.999	-.039 (.388)

(ACS)	-.054 (.000)	.947	-.054(.000)	.948	-.157 (.001)
(TP)	.010 (.607)	1.010	.008 (.661)	1.008	.020 (.623)
(RP)	.047 (.037)	1.048	.049 (.022)	1.050	.080 (.061)
(PeeE)	.041 (.000)	1.041	.039 (.000)	1.040	.230 (.000)
(SCap)	.011 (.095)	1.011	.010 (.088)	1.010	.116 (.005)
(MS)	.007 (.106)	1.007	.006 (.088)	1.006	.072 (.086)
(DS)	.002 (.830)	1.002	.002 (.806)	1.002	.068 (.167)
(ACJS)	.037 (.008)	1.037	.037 (.004)	1.037	.166 (.001)
(SES)	-.005 (.401)	.995	-.006 (.314)	.994	-.028 (.537)
(PE)	-.032 (.742)	.968	-.012 (.891)	.988	.005 (.896)
(II)	-.071 (.066)	.932	-.074 (.027)	.929	-.081 (.044)
Intercept	.380 (.000)	1.462	.375 (.000)	1.456	
Value/df	1.195		1.31		
AIC	1253.722		1255.352		
BIC	1340.750		1338.424		
LR χ^2	159.282 (.000)		242.320 (.000)		
Disp. P	.086				

Appendix 8.7: Regression Results of Campus Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.011 (.436)	.989	-.011 (.361)	.989	.044 (.340)
(PPLS)	-.010 (.457)	.990	-.011 (.355)	.990	-.039 (.391)
(PSLS)	.011 (.504)	1.011	.009 (.506)	1.009	.066 (.206)
(PPSS)	-.024 (.118)	.977	-.022 (.060)	.978	-.076 (.096)
(PSSS)	.013 (.431)	1.013	.006 (.631)	1.006	.099 (.067)
(PPPS)	-.022 (.115)	.978	-.022 (.060)	.978	-.104 (.028)
(PSPS)	-.052 (.002)	.949	-.042 (.001)	.959	-.175 (.001)
(PS)	.005 (.542)	1.005	.007 (.354)	1.007	-.019 (.692)
(SAS)	-.039 (.016)	.962	-.038 (.003)	.963	-.107 (.020)
(ACS)	-.083 (.000)	.920	-.076 (.000)	.927	-.211 (.000)
(TP)	.026 (.253)	1.026	.024 (.197)	1.025	.026 (.535)
(RP)	.019 (.495)	1.019	.018 (.449)	1.018	.007 (.877)
(PeeE)	.035 (.001)	1.035	.032 (.000)	.011	.108 (.020)
(SCap)	.012 (.121)	1.012	.094(.094)	1.011	.094 (.024)
(MS)	.012 (.015)	1.012	.012 (.005)	1.012	.053 (.222)
(DS)	.026 (.026)	1.027	.026 (.006)	1.027	.155 (.002)
(ACJS)	.024 (.165)	1.024	.027(.050)	1.028	.141 (.004)
(SES)	-.007 (.370)	.993	-.008 (.207)	.992	-.008 (.858)
(PE)	-.067 (.591)	.936	.032 (.000)	1.033	-.011 (.803)
(II)	-.058 (.242)	.944	-.063 (.079)	.939	-.061 (.134)
Intercept	.156 (.025)	1.169	.155 (.009)	1.167	
Value/df	1.177		1.565		

AIC	1190.397	1209.672	
BIC	1277.368	1292.690	
LR χ^2	145.564 (.000)	274.340 (.000)	
Disp. P	.291		

Appendix 8.8: Regression Results of Other Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.004 (.806)	.996	-.002 (.874)	.998	.038 (.412)
(PPLS)	-.035 (.036)	.965	-.033 (.017)	.968	-.048 (.291)
(PSLS)	.031 (.119)	1.032	.030 (.069)	1.030	.065 (.210)
(PPSS)	-.024 (.199)	.976	-.023 (.114)	.977	-.024 (.601)
(PSSS)	.024 (.198)	1.024	.023 (.130)	1.023	.123 (.017)
(PPPS)	-.059 (.000)	.943	-.057 (.000)	.944	-.146 (.002)
(PSPS)	-.048 (.011)	.953	-.050 (.001)	.951	-.161 (.002)
(PS)	.013 (.062)	.062	.014 (.013)	1.014	.031 (.513)
(SAS)	-.013 (.272)	.987	-.016 (.088)	.984	-.083 (.071)
(ACS)	-.063 (.000)	.939	-.063 (.000)	.939	-.199 (.000)
(TP)	.027 (.139)	1.027	.027 (.067)	1.028	.048 (.267)
(RP)	.010 (.631)	1.011	.003 (.853)	1.003	.012 (.787)
(PeeE)	.042 (.000)	1.043	.040 (.000)	1.040	.200 (.000)
(SCap)	.006 (.397)	1.006	.004 (.444)	1.004	.022 (.599)
(MS)	-.005 (.258)	.995	-.006 (.071)	.994	-.081 (.067)
(DS)	.014 (.147)	1.014	.014 (.080)	1.014	.107 (.042)
(ACJS)	.013 (.351)	1.013	.016 (.131)	1.017	.068 (.175)
(SES)	-.007 (.222)	.993	-.006 (.166)	.994	-.045 (.346)
(PE)	-.055 (.579)	.946	-.050 (.531)	.951	-.009 (.829)
(II)	-.048 (.231)	.953	-.061 (.058)	.941	-.050 (.237)
Intercept	.659 (.000)	1.933	.659 (.000)	1.932	
Value/df	1.280		1.712		
AIC	1441.251		1462.399		
BIC	1528.279		1545.471		
LR χ^2	132.211 (.000)		245.843 (.000)		
Disp. P	.211				

Appendix 09: Additional Regression Results based on Ex-Inmates' Sample

Appendix 9.1: Regression Results of Total Self-Reported Offending [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.112 (.011)	.894	-.112 (.003)	.894	-.135 (.017)
(PPLS)	-.030 (.475)	.971	-.043 (.229)	.958	-.026 (.630)
(PSLS)	.028 (.637)	1.028	.028 (.581)	1.029	.049 (.464)
(PPSS)	-.068 (.134)	.934	-.067 (.079)	.936	-.080 (.174)
(PSSS)	.074 (.202)	1.077	.064 (.196)	1.067	.080 (.223)
(PPPS)	-.001 (.989)	.999	.006 (.874)	1.006	.030 (.607)
(PSPS)	.013 (.804)	1.013	.030 (.512)	1.030	.089 (.154)
(PS)	.015 (.751)	1.015	.016 (.677)	1.016	-.025 (.648)
(SAS)	-.048 (.322)	.953	-.063 (.137)	.939	-.067 (.225)
(ACS)	.007 (.858)	1.007	.019(.558)	1.019	-.009 (.860)
(TP)	.134 (.001)	1.143	.126 (.000)	1.134	.169 (.001)
(RP)	-.120 (.002)	.887	-.120 (.000)	.887	-.147 (.003)
(PeeE)	.290 (.000)	1.336	.277 (.000)	1.319	.373 (.485)
(SCap)	-.039 (.314)	.962	-.033 (.301)	.968	-.034 (.485)
(MS)	.019 (.700)	1.019	.012 (.762)	1.013	.037 (.486)
(DS)	-.067 (.154)	.935	-.063 (.112)	.939	-.053 (.363)
(ACJS)	.100 (.020)	1.105	.097 (.006)	1.102	.082 (.128)
(SES)	-.149 (.000)	.861	-.148 (.000)	.863	-.127 (.015)
(II)	.070 (.036)	1.072	.069 (.008)	1.072	.101 (.034)
Age	-.116 (.035)	.891	-.114 (.014)	.892	-.112 (.086)
MD	.246 (.012)	1.278	.231 (.005)	1.260	.120 (.048)
Intercept	1.034 (.000)	2.812			
Value/df	1.043		1.408		
AIC	1220.488		1236.002		
BIC	1304.974		1316.815		
LR χ^2	156.131 (.000)		264.391 (.000)		
Disp. P	.098				

Appendix 9.2: Regression Results of Violent Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.092 (.135)	.912	-.092 (.082)	.912	-.117 (.047)
(PPLS)	-.045 (.455)	.956	-.066 (.197)	.936	-.034 (.546)
(PSLS)	-.092 (.257)	.912	-.095 (.187)	.910	-.047 (.516)
(PPSS)	-.124 (.053)	.883	-.123 (.026)	.884	-.100 (.104)
(PSSS)	.099 (.244)	1.104	.080 (.278)	1.084	.083 (.235)
(PPPS)	.044 (.515)	1.045	.053 (.369)	1.054	.050 (.426)

(PSPS)	.199 (.015)	1.220	.229 (.002)	1.257	.193 (.004)
(PS)	-.068 (.314)	.935	-.062 (.282)	.940	-.076 (.194)
(SAS)	-.137 (.051)	.872	-.152 (.013)	.859	-.109 (.065)
(ACS)	.038 (.492)	1.039	.049 (.304)	1.050	.027 (.605)
(TP)	.132 (.018)	1.023	.115 (.016)	1.121	.127 (.017)
(RP)	-.079 (.146)	.924	-.079 (.092)	.924	-.079 (.131)
(PeeE)	.313 (.000)	1.368	.296 (.000)	1.345	.317 (.000)
(SCap)	-.015 (.786)	.985	-.010 (.825)	.990	.001 (.990)
(MS)	.031 (.650)	1.032	.019 (.744)	1.020	.023 (.683)
(DS)	-.028 (.677)	.973	-.024 (.672)	.976	-.018 (.769)
(ACJS)	.097 (.105)	1.102	.099 (.052)	1.104	.057 (.315)
(SES)	-.080 (.170)	.923	-.085 (.097)	.918	-.033 (.555)
(II)	.078 (.088)	1.081	.085 (.017)	1.089	.106 (.038)
Age	-.196 (.013)	.822	-.193 (.005)	.824	-.149 (.033)
MD	.223 (.112)	1.250	.221 (.066)	1.247	.079 (.225)
Intercept	.265 (.002)	1.303	.269 (.000)	1.309	
Value/df	1.198		1.472		
AIC	960.904		968.902		
BIC	1045.390		1049.715		
LR χ^2	104.834 (.000)		166.551 (.000)		
Disp. P	.163				

Appendix 9.3: Regression Results of Property Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.056 (.344)	.945	-.056 (.344)	.945	-.048 (.392)
(PPLS)	-.071 (.220)	.932	-.071 (.220)	.932	-.086 (.126)
(PSLS)	-.050 (.463)	.951	-.050 (.463)	.951	-.016 (.802)
(PPSS)	-.077 (.203)	.925	-.077 (.203)	.925	-.098 (.098)
(PSSS)	.134 (.052)	1.144	.134 (.052)	1.144	.141 (.034)
(PPPS)	-.051 (.429)	.950	-.051 (.429)	.950	-.014 (.821)
(PSPS)	-.084 (.182)	.919	-.084 (.182)	.919	-.085 (.165)
(PS)	.020 (.749)	1.020	.020 (.749)	1.020	.016 (.778)
(SAS)	.034 (.639)	1.034	.034 (.639)	1.034	.007 (.909)
(ACS)	.009 (.873)	1.009	.009 (.873)	1.009	-.036 (.501)
(TP)	.110 (.050)	1.116	.110 (.050)	1.116	.125 (.020)
(RP)	-.125 (.024)	.882	-.125 (.024)	.882	-.138 (.010)
(PeeE)	.198 (.001)	1.219	.198 (.001)	1.219	.237 (.000)
(SCap)	-.090 (.104)	.914	-.090 (.104)	.914	-.092 (.079)
(MS)	.919 (.055)	.437	.055 (.437)	1.056	.114 (.048)
(DS)	-.071 (.292)	.932	-.071 (.292)	.932	-.055 (.381)
(ACJS)	.085 (.170)	1.088	.085 (.170)	1.088	-.206 (.000)
(SES)	-.218 (.000)	.804	-.218 (.000)	.804	.075 (.206)

(II)	.064 (.186)	1.066	.064 (.186)	1.066	.064 (.208)
Age	-.111 (.157)	.895	-.111 (.157)	.895	-.104 (.144)
MD	.155 (.264)	1.168	.155 (.264)	1.168	.73 (.260)
Intercept	.010 (.912)	1.010	.010 (.912)	1.010	
Value/df	.913		.910		
AIC	778.742		776.742		
BIC	863.229		857.556		
LR χ^2	84.594 (.000)		84.594 (.000)		
Disp. P	1.096				

Appendix 9.4: Regression Results of Other Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.027 (.751)	.973	-.027 (.751)	.973	-.059 (.326)
(PPLS)	-.197 (.021)	.821	-.197 (.021)	.821	-.138 (.014)
(PSLS)	.050 (.586)	1.052	.050 (.586)	1.052	.084 (.182)
(PPSS)	-.073 (.378)	.930	-.073 (.378)	.930	-.046 (.437)
(PSSS)	.083 (.381)	1.087	.083 (.381)	1.087	.092 (.147)
(PPPS)	-.123 (.138)	.884	-.123 (.138)	.884	-.091 (.120)
(PSPS)	.019 (.832)	1.019	.019 (.832)	1.019	.004 (.950)
(PS)	.083 (.335)	1.087	.083 (.335)	1.087	.066 (.252)
(SAS)	.087 (.396)	1.091	.087 (.396)	1.091	.041 (.505)
(ACS)	.038 (.625)	1.038	.038 (.625)	1.038	-.027 (.614)
(TP)	.157 (.049)	1.169	.157 (.049)	1.169	.150 (.006)
(RP)	-.211 (.006)	.810	-.211 (.006)	.810	-.178 (.001)
(PeeE)	.284 (.000)	1.329	.284 (.000)	1.329	.266 (.000)
(SCap)	.019 (.798)	1.020	.019 (.798)	1.020	.027 (.609)
(MS)	-.056 (.575)	.945	-.056 (.575)	.945	-.014 (.803)
(DS)	-.091 (.339)	.913	-.091 (.339)	.913	-.086 (.188)
(ACJS)	.214 (.009)	1.239	.214 (.009)	1.239	.159 (.007)
(SES)	-.159 (.061)	.853	-.159 (.061)	.853	-.114 (.049)
(II)	.041 (.511)	1.041	.041 (.511)	1.041	.046 (.373)
Age	.022 (.829)	1.023	.022 (.829)	1.023	-.016 (.819)
MD	.406 (.033)	1.500	.406 (.033)	1.500	.143 (.031)
Intercept	-.794 (.000)	.452	-.794 (.000)	.452	
Value/df	.840		.837		
AIC	580.700		578.700		
BIC	665.187		659.513		
LR χ^2	66.181 (.000)		66.182 (.000)		
Disp. P	7.776				

Appendix 9.5: Regression Results of Total Self-Reported Offending [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.007 (.149)	.993	-.007 (.097)	.993	-.130 (.019)
(PPLS)	-.003 (.487)	.997	-.005 (.204)	.995	-.031 (.556)
(PSLS)	-.008 (.320)	.992	-.007 (.253)	.993	.019 (.784)
(PPSS)	-.010 (.050)	.990	-.010 (.020)	.990	-.105 (.061)
(PSSS)	.015 (.026)	1.015	.014 (.012)	1.014	.066 (.296)
(PPPS)	.001 (.838)	1.001	.002 (.705)	1.002	.058 (.317)
(PSPS)	.001 (.907)	1.001	.002 (.704)	1.002	.078 (.190)
(PS)	-.002 (.840)	.998	-.001 (.826)	.999	-.011 (.855)
(SAS)	-.002 (.786)	.998	-.004 (.539)	.996	-.068 (.224)
(ACS)	.004 (.735)	1.004	.008 (.495)	1.008	.001 (.990)
(TP)	.054 (.006)	1.056	.050 (.003)	1.052	.172 (.001)
(RP)	-.048 (.020)	.953	-.046 (.008)	.955	-.155 (.002)
(PeeE)	.039 (.000)	1.040	.036 (.000)	1.037	.336 (.000)
(SCap)	-.004 (.575)	.996	-.004 (.485)	.996	.007 (.889)
(MS)	.001 (.829)	1.001	.001 (.834)	1.001	.012 (.817)
(DS)	-.016 (.062)	.984	-.016 (.028)	.984	-.047 (.415)
(ACJS)	.025 (.058)	1.026	.024 (.031)	1.024	.084 (.121)
(SES)	-.019 (.001)	.981	-.019 (.000)	.981	-.139 (.009)
(II)	.077 (.024)	1.080	.077 (.004)	1.080	.103 (.033)
Age	-.134 (.027)	.875	-.134 (.009)	.875	-.119 (.071)
MD	.215 (.048)	1.240	.205 (.025)	1.228	.123 (.046)
Intercept	1.076 (.000)	2.934	1.086 (.000)	2.963	
Value/df	1.070		1.440		
AIC	1020.591		1032.848		
BIC	1100.646		1109.422		
LR χ^2	125.672 (.000)		210.459 (.000)		
Disp. P	.097				

Appendix 9.6: Regression Results of Violent Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.003 (.755)	.997	-.003 (.683)	.997	-.096 (.099)
(PPLS)	-.008 (.414)	.992	-.011 (.163)	.989	-.037 (.512)
(PSLS)	-.019 (.217)	.982	-.019 (.129)	.981	-.019 (.801)
(PPSS)	-.021 (.035)	.979	-.021 (.013)	.979	-.117 (.049)
(PSSS)	.016 (.236)	1.016	.013 (.271)	1.013	.060 (.368)
(PPPS)	.005 (.649)	1.005	.006 (.477)	1.006	.071 (.245)
(PSPS)	.021 (.046)	1.022	.025 (.008)	1.026	.171 (.008)

(PS)	-.011 (.321)	.989	-.010 (.274)	.990	-.081 (.210)
(SAS)	-.014 (.218)	.986	-.017 (.097)	.983	-.113 (.059)
(ACS)	.016 (.411)	1.016	.019 (.247)	1.019	.029 (.594)
(TP)	.055 (.054)	1.057	.047 (.051)	1.048	.134 (.012)
(RP)	-.026 (.375)	.974	-.025 (.328)	.975	-.091 (.088)
(PeeE)	.041 (.000)	1.042	.038 (.000)	1.038	.290 (.000)
(SCap)	.001 (.959)	1.001	.001 (.930)	1.001	.049 (.357)
(MS)	.000 (.954)	1.000	.000 (.947)	1.000	.019 (.727)
(DS)	-.011 (.396)	.989	-.010 (.327)	.990	-.019 (.752)
(ACJS)	.024 (.205)	1.025	.023 (.142)	1.024	.057 (.323)
(SES)	-.008 (.311)	.992	-.009 (.199)	.991	-.042 (.452)
(II)	.086 (.074)	1.090	.094 (.010)	1.098	.110 (.033)
Age	-.240 (.007)	.787	-.237 (.002)	.789	-.150 (.032)
MD	.132 (.410)	1.142	.133 (.330)	1.142	.091 (.164)
Intercept	.336 (.001)	1.400	.341 (.000)	1.406	
Value/df	1.222		1.549		
AIC	812.365		821.424		
BIC	892.515		898.089		
LR χ^2	79.325 (.000)		129.166 (.000)		
Disp. P	.191				

Appendix 9.7: Regression Results of Property Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.037 (.183)	.964	-.037 (.183)	.964	-.070 (.204)
(PPLS)	-.023 (.426)	.977	-.023 (.426)	.977	-.083 (.142)
(PSLS)	-.068 (.053)	.934	-.068 (.053)	.934	-.084 (.201)
(PPSS)	-.030 (.319)	.971	-.030 (.319)	.971	-.114 (.043)
(PSSS)	.081 (.017)	1.085	.081 (.017)	1.085	.141 (.028)
(PPPS)	-.010 (.747)	.990	.010 (.747)	.747	.019 (.753)
(PSPS)	-.038 (.160)	.963	-.038 (.160)	.963	-.081 (.166)
(PS)	.001 (.948)	1.001	.001 (.948)	1.001	.033 (.580)
(SAS)	.008 (.482)	1.008	.008 (.482)	1.008	.003 (.966)
(ACS)	.009 (.646)	1.009	.009 (.646)	1.009	-.015 (.780)
(TP)	.049 (.082)	1.050	.049 (.082)	1.050	.125 (.020)
(RP)	-.047 (.106)	.954	-.047 (.106)	.954	-.142 (.008)
(PeeE)	.025 (.006)	1.026	.025 (.006)	1.026	.217 (.000)
(SCap)	-.006 (.531)	.994	-.006 (.531)	.994	-.047 (.375)
(MS)	.009 (.217)	1.009	.009 (.217)	1.009	.059 (.290)
(DS)	-.021 (.096)	.979	-.021 (.096)	.979	-.047 (.442)
(ACJS)	.026 (.179)	1.026	.026 (.179)	1.026	.071 (.230)
(SES)	-.030 (.000)	.970	-.030 (.000)	.970	-.210 (.000)
(II)	.064 (.196)	1.066	.064 (.196)	1.066	.062 (.217)

Age	-.113(.194)	.893	-.113 (.194)	.893	-.106 (.137)
MD	.181 (.236)	1.198	.181 (.236)	1.198	.065 (.321)
Intercept	.016 (.872)	1.016	.016 (.872)	1.016	
Value/df	.901		.897		
AIC	658.476		656.476		
BIC	738.911		733.414		
LR χ^2	77.701 (.000)		77.701 (.000)		
Disp. P	4.687				

Appendix 9.8: Regression Results of Other Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.006 (.915)	.994	-.006 (.915)	.994	-.078 (.183
(PPLS)	-.120 (.030)	.887	-.120 (.030)	.887	-.136 (.016)
(PSLS)	-.008 (.896)	.992	-.008 (.896)	.992	.065 (.297)
(PPSS)	-.043 (.437)	.958	-.043 (.437)	.958	-.056 (.330)
(PSSS)	.108 (.081)	1.114	.108 (.081)	1.114	.069 (.264)
(PPPS)	-.088 (.126)	.916	-.088 (.126)	.916	-.079 (.175)
(PSPS)	.011 (.842)	1.011	.011 (.842)	1.011	-.013 (.838)
(PS)	.012 (.407)	1.012	.012 (.407)	1.012	.069 (.243)
(SAS)	.021 (.209)	1.021	.021 (.209)	1.021	.057 (.351)
(ACS)	.011 (.652)	1.012	.011 (.652)	1.012	-.006 (.917)
(TP)	.069 (.079)	1.071	.069 (.079)	1.071	.136 (.015)
(RP)	-.097 (.016)	.907	-.097 (.016)	.907	-.174 (.001)
(PeeE)	.038 (.001)	1.038	.038 (.001)	1.038	.244 (.000)
(SCap)	.002 (.893)	1.002	.002 (.893)	1.002	.011 (.837)
(MS)	-.007 (.514)	.993	-.007 (.514)	.993	-.092 (.107)
(DS)	-.022 (.192)	.978	-.022 (.192)	.978	-.072 (.264)
(ACJS)	.044 (.079)	1.045	.044 (.079)	1.045	.149 (.011)
(SES)	-.023 (.045)	.977	-.023 (.045)	.977	-.123 (.034)
(II)	.045 (.467)	1.046	.045 (.467)	1.046	.058 (.266)
Age	.023 (.843)	1.023	.023 (.843)	1.023	-.013 (.852)
MD	.349 (.094)	1.417	.349 (.094)	1.417	.153 (.021)
Intercept	-.726 (.000)	.484	-.726 (.000)	.484	
Value/df	.845		.841		
AIC	500.508		498.508		
BIC	580.849		575.356		
LR χ^2	56.314 (.000)		56.314 (.000)		
Disp. P	1.154				

Appendix 10: Additional Regression Results based on University Employees' Sample

Appendix 10.1: Regression Results of Total Self-Reported Offending [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.009 (.227)	.991	-.006 (.071)	.994	-.025 (.632)
(PPLS)	-.022 (.001)	.978	-.016 (.000)	.984	-.045 (.358)
(PSLS)	-.018 (.015)	.983	-.015 (.000)	.986	-.064 (.250)
(PPSS)	-.006 (.356)	.994	-.014 (.000)	.986	-.159 (.004)
(PSSS)	.006 (.421)	1.006	.010 (.005)	1.010	.075 (.193)
(PPPS)	.0001 (.991)	1.000	-.001 (.841)	.999	.042 (.423)
(PSPS)	-.012 (.129)	.988	-.010 (.005)	.990	-.184 (.002)
(PS)	-.013 (.093)	.987	-.010 (.010)	.990	-.050 (.299)
(SAS)	-.009 (.432)	.991	-.004 (.450)	.996	-.028 (.556)
(ACS)	.018 (.254)	1.018	.018 (.020)	1.018	.093 (.059)
(TP)	.054 (.024)	1.055	.044 (.000)	1.045	.085 (.070)
(RP)	-.017 (.594)	.984	-.005 (.722)	.995	-.006 (.896)
(PeeE)	.048 (.000)	1.050	.044 (.000)	1.045	.311 (.000)
(SCap)	-.003 (.748)	.997	-.008 (.055)	.992	-.025 (.578)
(MS)	-.002 (.767)	.998	.000 (.946)	1.000	.047 (.349)
(DS)	-.022 (.092)	.978	-.016 (.007)	.984	-.020 (.683)
(ACJS)	.041 (.026)	1.042	.030 (.001)	1.031	.118 (.020)
(SES)	.004 (.563)	1.004	.005 (.173)	1.005	-.007 (.880)
MD	.426 (.002)	1.531	.253 (.000)	1.288	.099 (.034)
(II)	.101 (.169)	1.107	.080 (.021)	1.083	.027 (.549)
Intercept	1.047 (.000)	2.850	1.173 (.000)	3.231	
Value/df	1.205		3.821		
AIC	1447.668		1819.052		
BIC	1528.557		1896.263		
LR χ^2	103.166 (.000)		422.874 (.000)		
Disp. P	.708				

Appendix 10.2: Regression Results of Academic Dishonesty [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.044 (.255)	.957	-.044 (.255)	.957	-.050 (.324)
(PPLS)	-.039 (.311)	.962	-.038 (.315)	.963	.026 (.617)
(PSLS)	-.043 (.297)	.958	-.043 (.294)	.958	-.056 (.328)
(PPSS)	-.040 (.304)	.961	-.040 (.301)	.961	-.101 (.075)
(PSSS)	.031 (.457)	1.032	.031 (.456)	1.032	.090 (.134)
(PPPS)	.010 (796)	1.010	.010 (.800)	1.010	.021 (.685)

(PSPS)	-.043 (.306)	.958	-.043 (.306)	.958	-.116 (.052)
(PS)	-.031 (.004)	.969	-.031 (.004)	.969	-.124 (.014)
(SAS)	-.020 (.224)	.981	-.020 (.223)	.981	-.138 (.006)
(ACS)	.032 (.165)	1.033	.032 (.164)	1.033	.066 (.207)
(TP)	.065 (.064)	1.067	.065 (.063)	1.067	.109 (.027)
(RP)	-.052 (.238)	.949	-.052 (.235)	.949	-.052 (.305)
(PeeE)	.021 (.076)	1.022	.021 (.076)	1.022	.121 (.018)
(SCap)	-.028 (.021)	.972	-.028 (.021)	.972	-.073 (.127)
(MS)	.003 (.750)	1.003	.003 (.747)	1.003	.031 (.554)
(DS)	-.027 (.150)	.974	-.026 (.151)	.974	-.066 (.214)
(ACJS)	.052 (.045)	1.053	.051 (.046)	1.053	.096 (.071)
(SES)	.008 (.459)	1.008	.008 (.454)	1.008	.083 (.101)
(II)	-.009 (.920)	.991	-.009 (.919)	.991	-.044 (.358)
MD	.924 (.000)	2.518	.921 (.000)	2.512	.206 (.000)
Intercept	-1.463 (.000)	.232	-1.461 (.000)	.232	
Value/df	1.008		1.010		
AIC	542.258		540.417		
BIC	623.521		617.985		
LR χ^2	61.062 (.000)		75.550 (.000)		
Disp. P	.009				

Appendix 10.3: Regression Results of White-Collar Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.004 (.772)	.996	.002 (.797)	1.002	.043 (.410)
(PPLS)	-.041 (.002)	.960	-.030 (.000)	.971	-.067 (.158)
(PSLS)	-.032 (.035)	.968	-.032 (.000)	.968	-.067 (.228)
(PPSS)	-.014 (.320)	.986	-.026 (.002)	.974	-.150 (.005)
(PSSS)	.014 (.382)	1.014	.021 (.014)	1.021	.074 (.201)
(PPPS)	-.002 (.894)	.998	-.002 (.837)	.998	.039 (.454)
(PSPS)	-.029 (.070)	.971	-.018 (.029)	.982	-.179 (.002)
(PS)	-.004 (.652)	.996	-.002 (.611)	.998	-.020 (.682)
(SAS)	-.014 (.265)	.986	-.008 (.267)	.992	-.028 (.561)
(ACS)	.002 (.921)	1.002	.004 (.700)	1.004	.046 (.349)
(TP)	.053 (.042)	1.054	.051 (.000)	1.052	.081 (.086)
(RP)	-.013 (.688)	.987	-.011 (.550)	.989	-.010 (.840)
(PeeE)	.057 (.000)	1.059	.051 (.000)	1.052	.322 (.000)
(SCap)	-.005 (.605)	.995	-.009 (.064)	.991	-.022 (.630)
(MS)	-.005 (.427)	.995	-.004 (.326)	.996	.028 (.575)
(DS)	-.021 (.128)	.979	-.014 (.061)	.986	.011 (.828)
(ACJS)	.037 (.069)	1.037	.025 (.022)	1.025	.100 (.049)
(SES)	.003 (.701)	1.003	.005 (.289)	1.005	-.007 (.883)

(II)	.118 (.156)	1.125	.088 (.044)	1.092	.020 (.037)
MD	.360 (.012)	1.433	.194 (.009)	1.214	.108 (.020)
Intercept	.634 (.000)	1.885	.753 (.000)	2.124	
Value/df	1.169		2.911		
AIC	1247.368		1453.943		
BIC	1328.482		1531.370		
LR χ^2	99.583 (.000)		325.169 (.000)		
Disp. P	.741				

Appendix 10.4: Regression Results of Other Crimes [Raw Scores Standardized]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.008 (.747)	.992	-0.010 (.067)	0.884	-.028 (.603)
(PPLS)	-.072 (.006)	.931	-0.192 (.063)	0.826	-.067 (.198)
(PSLS)	-.055 (.031)	.946	-0.220 (.069)	0.802	-.063 (.271)
(PPSS)	-.047 (.087)	.954	-0.119 (.076)	0.887	-.158 (.007)
(PSSS)	.013 (.644)	1.013	0.073 (.073)	1.076	.040 (.500)
(PPPS)	-.040 (.101)	.961	-0.098 (.064)	0.907	-.030 (.579)
(PSPS)	-.015 (.597)	.985	-0.095 (.072)	0.910	-.123 (.037)
(PS)	-.023 (.009)	.978	-0.081 (.056)	0.922	-.063 (.221)
(SAS)	.020 (.177)	1.020	-0.094 (.129)	0.910	.071 (.166)
(ACS)	.040 (.034)	1.041	0.166 (.137)	1.181	.164 (.002)
(TP)	.036 (.206)	1.037	0.066 (.061)	1.069	.055 (.269)
(RP)	.030 (.405)	1.030	0.116 (.062)	1.123	.045 (.384)
(PeeE)	.030 (.006)	1.030	0.210 (.063)	1.233	.202 (.000)
(SCap)	.005 (.607)	1.005	-0.023 (.061)	0.977	.022 (.654)
(MS)	.004 (.570)	1.004	0.072 (.067)	1.074	.041 (.448)
(DS)	-.013 (.388)	.987	-.097 (.063)	0.908	-.038 (.472)
(ACJS)	.020 (.365)	1.020	0.118 (.059)	1.125	.102 (.059)
(SES)	.006 (.497)	1.006	0.001 (.060)	1.00	-.057 (.252)
(II)	.099 (.230)	1.104	0.40 (.054)	1.041	.034 (.484)
MD	.045 (.760)	1.046	-0.12 (.116)	0.887	-.035 (.484)
Intercept	-.139 (.195)	.870	-1.40 (.082)	0.926	
Value/df	1.139		1.500		
AIC	832.299		975		
BIC	913.635		1052		
LR χ^2			89.95 (0.000)		
Disp. P	.375				

Appendix 10.5: Regression Results of Total Self-Reported Offending [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.095 (.230)	.909	-.075 (.048)	.928	-.026 (.621)
(PPLS)	-.235 (.001)	.790	-.169 (.000)	.844	-.043 (.371)
(PSLS)	-.209 (.013)	.812	-.173 (.000)	.841	-.069 (.217)
(PPSS)	-.075 (.328)	.927	-.161 (.000)	.851	-.162 (.003)
(PSSS)	.067 (.432)	1.069	.113 (.006)	1.119	.072 (.213
(PPPS)	.002 (.978)	1.002	-.004 (.904)	.996	.052 (.438)
(PSPS)	-.122 (.172)	.885	-.098 (.013)	.906	-.179 (.003)
(PS)	-.110 (.109)	.896	-.078 (.015)	.925	-.046 (.330)
SAS	-.055 (.394)	.947	-.028 (.407)	.973	-.035 (.463)
(ACS)	.080 (.264)	1.083	.076 (.030)	1.079	.088 (.074)
(TP)	.144 (.025)	1.155	.119 (.000)	1.127	.085 (.0680
(RP)	-.037 (.594)	.964	-.010 (.746)	.990	-.005 (.913)
(PeeE)	.368 (.000)	1.445	.336 (.000)	1.399	.319 (.000)
(SCap)	.015 (.809)	1.015	-.028 (.371)	.973	-.007 (.885)
(MS)	-.031 (.678)	.969	.008 (.823)	1.008	.050 (.349)
(DS)	-.137 (.067)	.872	-.104 (.003)	.902	-.024 (.632)
(ACJS)	.167 (.021)	1.182	.123 (.000)	1.131	.119 (.019)
(SES)	.037 (.590)	1.038	.044 (.187)	1.045	-.014 (.757)
(II)	.100 (.175)	1.105	.079 (.023)	1.082	.026 (.563)
MD	.431(.002)	1.538	.255 (.000)	1.290	.098 (.035)
Intercept	1.039 (.000)	2.825	1.168 (.000)	3.216	
Value/df	1.203		3.826		
AIC	1447.031		1820.237		
BIC	1527.920		1897.449		
LR χ^2	103.803 (.000)		421.689 (.000)		
Disp. P	.708				

Appendix 10.6: Regression Results of Academic Dishonesty [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.116 (.241)	.891	-.115 (.241)	.891	-.048 (.350)
(PPLS)	-.098 (.333)	.906	-.098 (.336)	.907	.027 (.598)
(PSLS)	-.128 (.260)	.880	-.128 (.258)	.880	-.061 (.290)
(PPSS)	-.115 (.274)	.891	-.115 (.273)	.891	-.106 (.066)
(PSSS)	.085 (.458)	1.088	.085 (.458)	1.088	.091 (.130)
(PPPS)	.040 (.715)	1.041	.040 (.718)	1.040	.026 (.619)
(PSPS)	-.091 (.414)	.913	-.091 (.414)	.913	-.106 (.076)
(PS)	-.264 (.004)	.768	-.264 (.004)	.768	-.112 (.025)
(SAS)	-.127 (.173)	.881	-.126 (.173)	.881	-.142 (.005)

(ACS)	.150 (.156)	1.162	.150 (.155)	1.161	.066 (.207)
(TP)	.166 (.078)	1.181	.167 (.077)	1.181	.104 (.035)
(RP)	-.115 (.237)	.891	-.116 (.235)	.891	-.054 (.292)
(PeeE)	.158 (.077)	1.171	.157 (.077)	1.170	.124 (.016)
(SCap)	-.187 (.051)	.830	-.186 (.051)	.830	-.060 (.214)
(MS)	-.018 (.870)	.982	-.017 (.872)	.983	-.005 (.922)
(DS)	-.138 (.189)	.871	-.137 (.189)	.872	-.059 (.263)
(ACJS)	.200 (.048)	1.222	.199 (.049)	1.221	.093 (.083)
(SES)	.085 (.397)	1.088	.085 (.394)	1.089	.087 (.086)
(II)	-.013 (.889)	.987	-.013 (.888)	.987	-.048 (.322)
MD	.911 (.000)	2.486	.909 (.000)	2.482	.203 (.000)
Intercept	-1.454 (.000)	.234	-1.452 (.000)	.234	
Value/df	1.017		1.017		
AIC	544.190		542.305		
BIC	625.452		619.873		
LR χ^2	59.130 (.000)		73.662 (.000)		
Disp. P	.006				

Appendix 10.7: Regression Results of White-Collar Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.032 (.707)	.968	-.005 (.916)	.995	.038 (.464)
(PPLS)	-.223 (.003)	.800	-.159 (.000)	.853	-.064 (.175)
(PSLS)	-.196 (.032)	.822	-.193 (.000)	.824	-.069 (.214)
(PPSS)	-.087 (.289)	.916	-.156 (.001)	.855	-.151 (.005)
(PSSS)	.084 (.353)	1.088	.121 (.014)	1.128	.076 (.189)
(PPPS)	-.007 (.931)	.993	(.999)	1.000	.040 (.446)
(PSPS)	-.163 (.081)	.850	-.099 (.040)	.906	-.179 (.003)
(PS)	-.030 (.691)	.970	-.018 (.662)	.982	-.020 (.668)
(SAS)	-.075 (.287)	.928	-.043 (.301)	.958	-.033 (.490)
(ACS)	.006 (.941)	1.006	.010 (.821)	1.010	.041 (.408
(TP)	.142 (.042)	1.152	.138 (.000)	1.148	.081 (.086)
(RP)	-.034 (.642)	.966	-.025 (.533)	.976	-.011 (.829)
(PeeE)	.434 (.000)	1.544	.390 (.000)	1.477	.332 (.000)
(SCap)	.009 (.900)	1.009	-.031 (.425)	.970	.001 (.980)
(MS)	-.055 (.493)	.946	-.022 (.628)	.978	.036 (.496)
(DS)	-.137 (.084)	.872	-.096 (.026)	.908	.005 (.921)
(ACJS)	.153 (.054)	1.165	.103 (.016)	1.109	.102 (.044)
(SES)	.031 (.676)	1.032	.046 (.254)	1.047	-.014 (.762)
(II)	.116 (.164)	1.122	.087 (.045)	1.091	.035 (.445)
MD	.366 (.011)	1.442	.197 (.008)	1.218	.109 (.020)
Intercept	.626 (.000)	1.870	.750 (.000)	2.117	
Value/df	1.165		2.917		

AIC	1246.763	1455.569	
BIC	1327.877	1532.996	
LR χ^2	100.188 (.000)	323.543 (.000)	
Disp. P	.742		

Appendix 10.8: Regression Results of Other Crimes [Standardized Scales]

Variables	Negative Binomial		Poisson		OLS/WLS
	B	Exp(B)	B	Exp(B)	B
(PPD)	-.028 (.736)	.972	-.022 (.746)	.978	-.028 (.607)
(PPLS)	-.234 (.007)	.792	-.222 (.001)	.801	-.068 (.195)
(PSLS)	-.199 (.024)	.820	-.181 (.013)	.835	-.065 (.261)
(PPSS)	-.160 (.081)	.852	-.191 (.015)	.826	-.160 (.006)
(PSSS)	.033 (.719)	1.034	.040 (.597)	1.041	.028 (.631)
(PPPS)	-.140 (.093)	.870	-.148 (.027)	.862	-.029 (.593)
(PSPS)	-.036 (.703)	.965	-.033 (.659)	.967	-.118 (.046)
(PS)	-.178 (.019)	.837	-.166 (.008)	.847	-.050 (.326)
(SAS)	.098 (.234)	1.103	.092 (.176)	1.097	.061 (.229)
(ACS)	.170 (.049)	1.185	.181 (.013)	1.198	.161 (.002)
(TP)	.098 (.202)	1.103	.074 (.253)	1.077	.059 (.239)
(RP)	.071 (.368)	1.074	.094 (.146)	1.098	.049 (.347)
(PeeE)	.234 (.004)	1.264	.235 (.000)	1.265	.208 (.000)
(SCap)	.058 (.440)	1.059	.044 (.489)	1.045	.026 (.589)
(MS)	.054 (.561)	1.055	.065 (.397)	1.067	.044 (.436)
(DS)	-.083 (.343)	.921	-.086 (.224)	.917	-.041 (.444)
(ACJS)	.083 (.327)	1.087	.084 (.229)	1.087	.105 (.052)
(SES)	.042 (.599)	1.043	.025 (.708)	1.025	-.072 (.150)
(II)	.097 (.243)	1.101	.104 (.132)	1.109	.036 (.466)
MD	.048 (.748)	1.049	.030 (.805)	1.031	-.035 (.475)
Intercept	-.142 (.185)	.867	-.129 (.158)	.879	
Value/df	1.138		1.505		
AIC	832.763		846.093		
BIC	914.099		923.732		
LR χ^2			87.818 (.000)		
Disp. P	.379				

Appendix 11 Summary of Empirical Studies

Variable	Theoretical Expectations	Empirical Results
Deterrence (probability of detection/arrest and severity of punishment)	Since ***probability of arrest*** is like probability of paying a price for the crime committed, it should decrease participation in criminal activities. ***Severity of punishment*** is the actual price that is paid for offences committed and hence should be inversely related with participation in criminal activity.	**[-]**Buonanno & Montolio (2008); Corman & Mocan (2000 & 2005); Draca et al. (2011); Engel et al., (2014); Evans & Owens (2007); Fagan et al., (2002); Funk & Kugler (2003); Gould & Stecklov, (2009); Halicioglu, Andres & Yamamura (2012); Han, Bandyopadhyay & Bhattacharya (2013); Islam (2016); Jabbar & Mohsin (2014); Keizer, Lindenberg, and Steg (2008); Kelling and Sousa (2001); Klepper and Nagin (1989); Levitt (1998, 2004); Loughran et al. (2016); Machin & Meghir (2004); Marvell & Moody (1996); Matsueda, Kreager and Huizinga (2006); Melendez (2006); Paternoster and Simpson (1996); Pickett, Loughran & Bushway (2016);Pryor et al., (2008); Rosenfeld, Fornango & Rengifo (2007); Ross (2012); Sloan et al., (2016); Taylor (2001); Tella, Edwards & Schargrodsky (2004); Travaglini (2003); Weatherburn, Halstead & Ramsey (2016); Witte (1980); and Yamamura (2009).
		[0] Bates, Darvell & Watson (2017); Brier and Fienberg (1980); Forst (1976), Geller (2007); Harcourt and Ludwig (2006); Katz, Webb, and Schaefer (2001); Kollias, Mylonidis & Paleologou (2013); Nagin (1978) and Sever (2001).
		[±] Carneiro, Loureiro & Sachsida (2005)
		[+] Piquero et al. (2005);
Unemployment	In the original [economics] models of crime, unemployment is thought as a reduction in legitimate earnings and should increase participation in crime [known as motivational effect of crime]. But unemployment also has an opportunity effect, i.e. more unemployment should increase presence of guardians and hence	**[+]**Altindag (2012); Buonanno and Montolio (2008); Carmichael & Ward (2001); Cox (2010); Edmark (2005); Engelhardt, Rocheteau, and Rupter (2008); Fergusson, Horwood and Woodward (2001); Gould, Weingerb and Mustard (2002); Griffin and Armstrong (2003); Halicioglu, Andres & Yamamura (2012); MacKenzie and De Li (2002); Merlo & Wolpin (2015); Papps and Winkelmann (2000); Raphael and Winter-Ebmer (2001); Savolainen (2009); Uggen and Wakefield (2008); Uggen (2000); Verbruggen et al., (2015); and Wadsworth (2006).
		[±] Anderson, 2012; and Phillips & Land (2012).
		[-] Han, Bandyopadhyay & Bhattacharya (2013); Jabbar & Mohsin (2014); Kollias, Mylonidis &

	less opportunities for crime.	Paleologou (2013); Piquero, Piquero, & Weisburd (2016); and Trumbull (1989).
		[0] Fallahi & Rodriguez (2014); Han, Bandyopadhyay & Bhattacharya (2013).
Income	Increase in legal income is expected to reduce differential between illegal and legal income opportunities and hence is expected to be inversely related with criminal behavior. However, most reported studies use income as the size of transferable asset and hence may be criminogenic.	**[+]** Buonanno and Montolio (2008); Shoukry (2016);Uggen and Thompson (2003); and Verbruggen et al., (2015).
		[±] Carneiro, Loureiro & Sachsida (2005)
		[-] Han, Bandyopadhyay & Bhattacharya (2013); Kollias, Mylonidis & Paleologou (2013); Machin & Meghir (2004); Myers Jr. (1983); Trumbull (1989); Verbruggen et al., (2015); Weatherburn, Halstead, & Ramsey (2016).
Income inequality	At the one hand, income inequality can be considered as opportunity for more loot [greater expected benefits from crime] and on the other hand, there would be more people whose stakes in conformity would be low [meager expected costs from committing crime]. Both should lead to more participation in criminal activity.	**[+]** Fajnzylber et al. (2002); Gillani, Rehman & Gill (2009); Gould et al. (2002); Islam (2016); Jalil & Iqbal (2010); Khan et al., (2015); Zhang (1997).
		[-]Chintrakarn & Herzer (2012); Hauner, Kutan & Spivey (2012).
		[0] Chintrakarn & Herzer (2012); Han, Bandyopadhyay & Bhattacharya (2013); Hauner, Kutan & Spivey (2012); Kelly (2000); Neumayer (2005).
Education	Education and training enhances the earning opportunities in the legal sector and hence is expected to be negatively correlated with criminal participation.	**[±]** Carneiro, Loureiro & Sachsida (2005)
		[-] Arum and Lafree (2008); Buonanno & Montolio (2008); Hjalmarsson et al. (2015); Jabbar & Mohsin (2014); Jalil & Iqbal (2010); Jonck et al., (2015); Khan et al., (2015); Lochner and Moretti (2004); Machin et al. (2011); Merlo & Wolpin (2015); Suhail & Javed (2004).
		[+] Loureiro et al., (2009)

Note: *[-], [+] and [0] implies negative, positive and null empirical relationship, respectively, of the variable under consideration with crime. [±] however implies either ambiguity or different short run long run impact on crime.*

Appendix 12 Summary of Empirical Studies (Pakistan)

Variable	Theoretical Expectations	Empirical Results
Deterrence (probability of detection/arrest and severity of punishment)	Negative	**[-]**Alam et al., (2014); Jabbar & Mohsin (2014); Salahuddin (2014).
Unemployment	Indeterminate	[+] Khan et al., (2015); Alam et al., (2014); Gillani, Khan & Gill (2011); Gillani, Rehman & Gill (2009); Jalil & Iqbal (2010).
		[-] Jabbar & Mohsin (2014)
Legal income	Negative	**[±]** Khan et al., (2015)
		[+Inflation] Gillani, Rehman & Gill (2009); Zafar et al., (2013); Alam et al., (2014).
		[0] Mahmood & Cheema (2004a);
Income inequality	Positive	**[±]** Khan et al., (2015)
		[+] Gillani, Rehman & Gill (2009); Mahmood & Cheema (2004b); Jalil & Iqbal (2010).
Education	Negative	**[-]** Khan et al., (2015); Zafar et al., (2013); Suhail & Javed (2004); Jalil & Iqbal (2010); Jabbar & Mohsin (2014).

Note: *[±] signifies short run long run differences in impact.*

Appendix 13 Questionnaire used for data collection from students' sample

Section A: Information about the respondent

A 01: Sex	1. Male 2. Female
A 02: Age	(in years) _____
A 03: Education	(in years) _____
A 04: Residence	1. Rural 2. Urban 3. Other_____
A 05: Marital Status	1. Single 2. Married 3. Other_____
A 06: Are/were your parents educated?	1. Yes 2. No
A 07: If yes, then what is/was the employment of your father?	_____
A 08: Family Size	Total _____ Adults_____ Children_____

Section B: Household Socio-Economic Status

B01	**B02**	**B03**	**B04**	**B05**	**B06**	**B07**	**B08**	**B09**
ID (All those family members who satisfy the condition: $(5 \leq Age \leq 60)$	Sex Male (1) Female (0)	Age (in years)	Relationship with the Respondent	Highest Education (in years)	Employment status Employed (1) Self employed (2) Unemployed (3) Student (4)]	Profession (if employed or self employed)	*Why left Education (if age is between 5 and 30 and is not enrolled)	Type of institute (if the mentioned family member is enrolled) Public (1) Private (2) Mosque (3) Madrassa (4)]
01								
02								
03								
…								
10								
B10: Approximate monthly income of the household (from all sources): PKR_____								
B11: Approximate monthly consumption of the household: PKR_____								
B12: Approximate average monthly income in the neighbourhood: PKR_____								
***Possible options for B08: 1.** Poverty, **2.** No school, **3.** Institute was quite distant **4.** Was not good at school, **5.** Had to help my father/mother **6.** Other (please specify)								

Section C: Kindly read the following statement and indicate how much true/untrue is each statement with respect to your household? *[**Scale:** Never true (1), rarely true (2), sometimes but infrequently true (3), neutral (4), sometimes true (5), Usually true (6), always true (7)]*.

Statements	Response categories						
C01: We always have enough to eat and the kinds of food we want	1	2	3	4	5	6	7
C02: We have enough to eat but not always the kinds of food we want	1	2	3	4	5	6	7
C03: Often we do not have enough to eat because of shortage or resources	1	2	3	4	5	6	7
C04: Most of my household does not eat much because they are health conscious (on diet)	1	2	3	4	5	6	7
C05: We rely on only a few kinds of low-cost food	1	2	3	4	5	6	7
C06: Balanced food is good but we couldn't afford that	1	2	3	4	5	6	7
C07: The space (number of rooms, toilets and kitchen) in our home is more than enough for our needs	1	2	3	4	5	6	7
C08: Our home is pool proof with respect to seasonal catastrophes (heat, rains etc)	1	2	3	4	5	6	7
C09: There is no part in our home that needs to repaired	1	2	3	4	5	6	7
C10: We have sufficient energy sources (electricity, UPS and/or solar panel) at home for our basic energy needs	1	2	3	4	5	6	7
C11: I think the drinking water available to us at our home is safe	1	2	3	4	5	6	7
C12: The basic health facilities are 24 hours available at a reasonable distance from our home	1	2	3	4	5	6	7
C13: We do not have to cover a long distance for purchasing household food items	1	2	3	4	5	6	7
C14: The children in my household are being educated at quality schools	1	2	3	4	5	6	7
C15: We do not have to use open wood/dried animal dung fire for cooking at our household	1	2	3	4	5	6	7
C16: My households' financial status is bad as compared to the rest of the neighborhood	1	2	3	4	5	6	7
C17: We cannot afford to own and operate a car for our own household use	1	2	3	4	5	6	7
C18: My households' income is hardly enough to pay for basic necessities (food, shelter, education and health)	1	2	3	4	5	6	7

C19: We cannot afford the type of leisure activities (e.g. sports, media) that my household member would most prefer	1	2	3	4	5	6	7

Section D: Social capital

D01: How many groups or organizations do you belong to (religious groups, sports teams, or just groups of people who get together regularly to do an activity or task)? ----------[Absolute frequency]						
D02: On the average, how much money, if any, do you contribute to the groups to which you belong in a month? ----------[Absolute frequency]						
D03: On average, how often do you participate in the activities of the groups to which you belong in a month? ----------[Absolute frequency]						
D04: To what extent do you participate in the group(s)'s decision-making? [***Scale:*** *From very small extent (1) to very large extent (5)]*	1	2	3	4	5	
D05: Thinking about the members of this group (the most important of the groups), would you say that most are from the same: [can select more than one] ***[Scale:*** *Neighborhood (1), family (2), tribe, caste or ethnic (3), religion (4), education and income levels (5), gender (6)]*	1	2	3	4	5	6
D06: Generally speaking, would you say that you can't be too careful in dealing with people, or that most people can be trusted? ***[Scale:*** *from "you cannot be too careful (1)" to "most people can be trusted (5)"]*	1	2	3	4	5	
D07: Would you say that most of the time people are looking out for themselves, or they are trying to be helpful? ***[Scale:*** *From "are just looking for themselves (1)" to "try to be helpful (5)"]*	1	2	3	4	5	
D08: Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair? ***[Scale:*** *From "would take advantage of you (1)" to "would try to be fair (5)"]*	1	2	3	4	5	
D09: How well do people in your community/village/neighborhood get along these days? ***[Scale:*** *from "not getting along at all (1)" to "getting along very well (5)"]*	1	2	3	4	5	
D10: How would you rate the togetherness or feeling of belonging in your neighborhood/village/community? ***[Scale:*** *From "not close at all (1)" to "very close (5)"]*	1	2	3	4	5	
D11: How likely is it that you would ask your neighbors for help if you were sick or facing any other problem? ***[Scale:*** *From "very unlikely (1)" to "very likely (5)"]*	1	2	3	4	5	
D12: How much do you feel you can trust the people in each of the following groups? ***[Scale:*** *Never (1), rarely (2), sometimes (3), frequently (4), usually (5), every time (6)]*						
a) People in your tribe/caste/race/religion/ or ethnic group?	1	2	3	4	5	6
b) People who belong to the same clubs, organizations, or groups as you?	1	2	3	4	5	6
c) The business owners and traders you buy things from or do business with?	1	2	3	4	5	6
d) Politicians?	1	2	3	4	5	6

e) People in your family?	1	2	3	4	5	6
f) Government service providers (education, health, electricity, water, etc.)?	1	2	3	4	5	6
g) Local/municipal government?	1	2	3	4	5	6
h) Judges/courts/police?	1	2	3	4	5	6
i) People in your village/neighborhood?	1	2	3	4	5	6
j) People in other tribes/castes/race/religion/or ethnic groups?	1	2	3	4	5	6

Section E

E01: Of all the crimes that are committed, how many would you guess are reported to the police? ----------[from 0% to 100%]

E02: Have you committed any of the following acts during the past 2 years? Also provide an estimate (in %) about other people (sharing your socio economic and demographic characteristics) engagement in each act.

Acts	Your Response		Your estimate (0 – 100%) about others involvement in the act
	Yes	No	
a) Copying answers from other students or materials during exams			
b) Impersonation			
c) Getting advance copies of an exam			
d) Lied to a teacher about missing an exam			
e) Eating/drinking from a cafeteria/canteen without paying the proper price			
f) Using public property illegally (e.g. residing in hostel without allotment)			
g) Misuse/damaged public property (i.e. water, electricity, internet etc)			
h) Flattering the teachers or any other employee			
i) Assault			
j) Intimidation			
k) Forgery			
l) Theft of any type			
m) Swindle			
n) Blackmailing/extortion			
o) Bribery			
p) Buying, selling, possession or consumption of illegal drugs			
q) Holding a weapon without license			
r) Graffiti on walls, toilets, or other public places			

s) Over speeding			
t) Designing and using fake IDs			
u) Driving without license			
v) Bought, received, or sold stolen goods			
w) Participated in a fight			
x) Got into a cinema or other facility (e.g. bus etc) without paying proper fee			
y) Doing acts parents would not permit			
z) Viewing porn videos			
aa) Forcible fondling			
bb) Deceit			

E03: Considering your friends and class mates at this University, how many have ever done the following things? ***[Scale:*** *None (1), Few (2), Some (3), Most (4), All (5)]*.

Acts	Responses				
a) Copying answers from other students or materials during exams	1	2	3	4	5
b) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5
c) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5
d) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5
e) Buying, selling, possession or using stolen goods	1	2	3	4	5
f) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5
g) Graffiti on walls, toilets, or other public places	1	2	3	4	5
h) Designing and using fake IDs	1	2	3	4	5
i) Viewing porn videos	1	2	3	4	5

E04: Of all the crimes that are reported to the police, how many would you guess are solved or cleared up? ----------[0% -100%]

E05: Do you think you would be detected if you commit the following acts?

[Scale: *Extremely unlikely (1), Moderately unlikely (2), Slightly unlikely (3), Slightly likely (4), Moderately likely (5), extremely likely (6)]*.

Acts	Responses					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6

c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E06: Upon commission of the following acts, how likely is it that you would escape/avoid the punishment prescribed for each act

[Scale: *Extremely unlikely (1), Moderately unlikely (2), Slightly unlikely (3), Slightly likely (4), Moderately likely (5), extremely likely (6)]*

Acts	**Responses**					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E07: Would most of the people whose opinions you value lose respect for you if you commit the following acts?

[Scale: *Extremely unlikely (1), Moderately unlikely (2), Slightly unlikely (3), Slightly likely (4), Moderately likely (5), extremely likely (6)].*

Acts	Responses					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E08: Would you feel guilty/remorse/personal discomfort if you commit any of the following acts?

[Scale: *Extremely guilty (1), Moderately guilty (2), Slightly guilty (3), Slightly guiltless (4), moderately guiltless (5), Extremely guiltless (6)]*

Acts	Responses					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6

k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E09: Given that your involvement in the following acts is detected, and the authorities responsible are committed to inflict the prescribed sanctions upon you, how big a problem would it create for your life?

***[Scale:** No problem at all (1), Hardly any problem (2), A little problem (3), A big problem (4), a very big problem (5), don't know (6)]*

Acts	**Responses**					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E10: If most of the people whose opinion you value did lose respect for you, how big a problem would it create for your life?
***[Scale:** No problem at all (1), Hardly any problem (2), A little problem (3), A big problem (4), a very big problem (5), don't know (6)]*

Acts	**Responses**					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6

g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E11: If you did feel guilty for doing the following acts, how big a problem would it create for your life?

[Scale: *No problem at all (1), Hardly any problem (2), A little problem (3), A big problem (4), a very big problem (5), don't know (6)]*

Acts	**Responses**					
a) Copying answers from other students or materials during exams	1	2	3	4	5	6
b) Impersonation	1	2	3	4	5	6
c) Getting advance copies of an exam	1	2	3	4	5	6
d) Eating/drinking from a cafeteria/canteen without paying the proper price	1	2	3	4	5	6
e) Using public property illegally (e.g. residing in hostel without allotment)	1	2	3	4	5	6
f) Misuse/damaged public property (i.e. water, electricity, internet etc)	1	2	3	4	5	6
g) Buying, selling, possession or using stolen goods	1	2	3	4	5	6
h) Buying, selling, possession or consumption of illegal drugs	1	2	3	4	5	6
i) Graffiti on walls, toilets, or other public places	1	2	3	4	5	6
j) Got into a cinema or other facility (e.g. bus etc) without paying proper fee	1	2	3	4	5	6
k) Designing and using fake IDs	1	2	3	4	5	6
l) Driving without license	1	2	3	4	5	6
m) Viewing porn videos	1	2	3	4	5	6

E12: In recent years there has been a sharp increase in the nation's crime rate. Indicate your level of agreement/disagreement to the following statements that relates to causes of crime and criminality in the country. ***[Scale:*** *From "Strongly disagree (1)" to "Strongly agree (5)"]*.

Statements	**Responses**				
a) A person becomes a criminal because it is carried in the blood	1	2	3	4	5
b) Crime is due only to hereditary factors	1	2	3	4	5
c) Criminals cannot change their destiny	1	2	3	4	5

d)	If there were not so much permissiveness, there would not be so much crime	1	2	3	4	5
e)	Most criminals are mentally ill	1	2	3	4	5
f)	Crime is fundamentally due to poor economic conditions (poverty and unemployment)	1	2	3	4	5
g)	Crime is due only to social and physical environment	1	2	3	4	5
h)	Crime is more often a flaw in our society than a flaw in the offender	1	2	3	4	5
i)	Most criminals have poor cultural and educational levels	1	2	3	4	5
j)	Drugs are the main cause of crime	1	2	3	4	5
k)	If a person commits a crime it is because he/she wants to	1	2	3	4	5
l)	Inequality in income and opportunities are the main causes of crime	1	2	3	4	5
m)	Crime is largely caused by misgovernance	1	2	3	4	5
n)	Rewards from illegal activities far outweighs those from legal activities	1	2	3	4	5
o)	People learn criminal tendencies from violence shown by the media	1	2	3	4	5

E13: Now, I'd like to get your views about the best ways to deal with crime. Which of the approaches listed below do you think would be the best ways to reduce crime? ***[Scale:*** *From "Strongly disagree (1)" to "strongly agree (5)"].*

Crime control approaches		Responses				
a)	Eradicate poverty and unemployment	1	2	3	4	5
b)	Getting parents to exert stricter discipline over their children	1	2	3	4	5
c)	Improving conditions in our jails and prisons so that more people convicted of crimes will be rehabilitated and not go back to a life of crime	1	2	3	4	5
d)	Reforming our courts so that persons charged with crimes can get fairer and speedier justice	1	2	3	4	5
e)	Really cracking down on criminals by giving them longer prison terms to be served under the toughest possible conditions	1	2	3	4	5
f)	Putting more policemen on the job to prevent crimes and arrest more criminals	1	2	3	4	5
g)	Pay more attention to religious training	1	2	3	4	5
h)	Provide better educational and recreational facilities for the youngsters	1	2	3	4	5
i)	More parental control-parents are too permissive	1	2	3	4	5
j)	The police must have more autonomy with regard to law enforcement	1	2	3	4	5
k)	Increasing pay of the police force	1	2	3	4	5
l)	Less discrimination in law enforcement	1	2	3	4	5
m)	Ban on violence on TV, news and movies	1	2	3	4	5
n)	The best way of preventing crime is to implement the death penalty in its true spirit	1	2	3	4	5
o)	In order to prevent crime it is necessary to put more money into deprived areas	1	2	3	4	5
p)	Efforts directed at the prevention of crime are a waste of time	1	2	3	4	5
q)	Progressive elimination of poor areas of big cities would decrease crime significantly	1	2	3	4	5

E14: The following statements relates to the various methods criminals are treated. State your level of agreement/disagreement with each statement. ***[Scale:*** *From "Strongly disagree (1)" to "strongly agree (5)"].*

Statements	Responses				
a) Criminals need strong treatment in prison	1	2	3	4	5
b) Hard work is the best rehabilitation measure for criminals	1	2	3	4	5
c) Every prisoner should have the opportunity to do paid work while serving his/her sentence	1	2	3	4	5
d) Physical punishment is necessary, from time to time, so that criminals get what they deserve	1	2	3	4	5
e) Application of treatments aimed at social rehabilitation of criminals must be favored	1	2	3	4	5
f) When the conditions of imprisonment are improved (spaciousness, cleanliness, intimacy, etc.), rehabilitation will be easier	1	2	3	4	5
g) State powers should designate a lot more money to build more humane prisons	1	2	3	4	5
h) Loss of freedom, without any kind of rehabilitation measure, is a poor penal method	1	2	3	4	5
i) It is an injustice that society pays for prisoners to eat without working	1	2	3	4	5
j) Reform of the current penitentiary system is fundamental for achieving the rehabilitation aim	1	2	3	4	5
k) Current prisons are 'schools of crime' because of lack of economic and human resources	1	2	3	4	5

Section F: This questionnaire lists various attitudes and behaviors of parents. As you remember your Father/Mother (whichever was the primary caretaker) in your first 16 years, would you place a tick in the most appropriate box next to each question?
[Scale: *Never (1), Rarely (2), Occasionally (3), Sometimes (4), Frequently (5), Usually (6), Every time (7)]*

Statements	Responses						
a) Appeared to understand my problems and worries	1	2	3	4	5	6	7
b) Could make me feel better when I was upset	1	2	3	4	5	6	7
c) Seemed emotionally cold to me	1	2	3	4	5	6	7
d) Did not help me as much as I needed	1	2	3	4	5	6	7
e) Their company provided a sense of cooperation	1	2	3	4	5	6	7
f) Showed interest in listening and helping me	1	2	3	4	5	6	7
g) Let me know the amount of care about me	1	2	3	4	5	6	7
h) Pleased to know I was doing things they approved	1	2	3	4	5	6	7
i) Discussed my school/outdoor activities routinely	1	2	3	4	5	6	7
j) Tried to control everything I did	1	2	3	4	5	6	7
k) Tended to baby me	1	2	3	4	5	6	7

l) Liked me to make my own decisions	1	2	3	4	5	6	7
m) Gave me as much freedom as I wanted	1	2	3	4	5	6	7
n) Criticized my own ideas	1	2	3	4	5	6	7
o) Every rule made for me was explained	1	2	3	4	5	6	7
p) Knew whom I meet in the evening	1	2	3	4	5	6	7
q) Expected me to tell them whenever going out	1	2	3	4	5	6	7
r) Never ending problems usually emerged between us	1	2	3	4	5	6	7

Section G: Read the following statements and indicate your level of agreement/disagreement with each one.

[Scale: *Strongly agree (5), agree (4), neither agree nor disagree (3), disagree (2), strongly disagree (1)]*

Statements	Responses				
a) I feel close to people at the institution where I study	1	2	3	4	5
b) The teachers at this institution treat students fairly	1	2	3	4	5
c) In studies we learn many things that are important for the future	1	2	3	4	5
d) I have a high level of trust in one of my teachers	1	2	3	4	5
e) I am very good in studies as compared to other students of my age	1	2	3	4	5
f) I find the studies pointless	1	2	3	4	5
g) I can get along well with most of my classmates	1	2	3	4	5
h) I pay much attention during lessons	1	2	3	4	5
i) I do the best I can to get good grades	1	2	3	4	5

Section H: Please read the following sentences and indicate to what extent these statements reflect your personality.
[Scale: *Very untrue (1), Untrue (2), Sometimes untrue (3), Neutral (4), Sometimes true (5), True (6), Very true (7)]*.

Statements	Responses						
a. I often do things on impulse	1	2	3	4	5	6	7
b. I would like to take off on a trip with no preplanned or definite routes or timetables	1	2	3	4	5	6	7
c. I enjoy getting into new situations where you can't predict how things will turn out	1	2	3	4	5	6	7
d. I sometimes like to do things that are a little frightening	1	2	3	4	5	6	7
e. I'll try anything once	1	2	3	4	5	6	7
f. I would like the kind of life where one is on the move and travelling a lot, with lots of change and excitement	1	2	3	4	5	6	7
g. I sometimes do "crazy" things just for fun	1	2	3	4	5	6	7
h. I prefer friends who are excitingly unpredictable	1	2	3	4	5	6	7
i. I often get so carried away by new and exciting things and ideas that I never think of possible complications	1	2	3	4	5	6	7
j. I like "wild" uninhibited parties	1	2	3	4	5	6	7
k. My body often feels all tightened up for no apparent reason	1	2	3	4	5	6	7
l. I frequently get emotionally upset	1	2	3	4	5	6	7
m. I tend to be oversensitive and easily hurt by thoughtless remarks and actions of others	1	2	3	4	5	6	7

n.	I am easily frightened	1	2	3	4	5	6	7
o.	I sometimes feel panicky	1	2	3	4	5	6	7
p.	I often feel unsure of myself	1	2	3	4	5	6	7
q.	I often worry about things that other people think are unimportant	1	2	3	4	5	6	7
r.	I often feel like crying sometimes without a reason	1	2	3	4	5	6	7
s.	I don't let a lot of trivial things irritate me	1	2	3	4	5	6	7
t.	I often feel uncomfortable and ill at ease for no real reason	1	2	3	4	5	6	7
u.	When I get mad, I say ugly things	1	2	3	4	5	6	7
v.	It's natural for me to curse when I am mad	1	2	3	4	5	6	7
w.	I almost never feel like I would like to hit someone	1	2	3	4	5	6	7
x.	If someone offends me, I just try not to think about it	1	2	3	4	5	6	7
y.	If people annoy me I do not hesitate to tell them so	1	2	3	4	5	6	7
z.	When people disagree with me I cannot help getting into an argument with them	1	2	3	4	5	6	7
aa.	I have a very strong temper	1	2	3	4	5	6	7
bb.	I can't help being a little rude to people I do not like	1	2	3	4	5	6	7
cc.	I am always patient with others even when they are irritating	1	2	3	4	5	6	7
dd.	When people shout at me, I shout back	1	2	3	4	5	6	7
ee.	I do not like to waste time just sitting around and relaxing	1	2	3	4	5	6	7
ff.	I lead a busier life than most people	1	2	3	4	5	6	7
gg.	I like to be doing things all of the time	1	2	3	4	5	6	7
hh.	I can enjoy myself just lying around and not doing anything active	1	2	3	4	5	6	7
ii.	I do not feel the need to be doing things all of the time	1	2	3	4	5	6	7
jj.	When on vacation I like to engage in active sports rather than just lie around	1	2	3	4	5	6	7
kk.	I like to wear myself out with hard work or exercise	1	2	3	4	5	6	7
ll.	I like to be active as soon as I wake up in the morning	1	2	3	4	5	6	7
mm.	I like to keep busy all the time	1	2	3	4	5	6	7
nn.	When I do things, I do them with lots of energy	1	2	3	4	5	6	7

Section I: The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: 1, 2, 3, 4, or 5.
[Scale: *from "Does not describe me well (1)" to "Describes me very well (5)"]*.

Statements	**Responses**				
a. When I'm really angry with someone, other people better stay away from me	1	2	3	4	5
b. When I have a serious disagreement with someone, it's usually hard for me to talk to them calmly about it without getting upset	1	2	3	4	5
c. I often do whatever brings me pleasure here and now, even at the cost of some distant goal	1	2	3	4	5
d. I feel that having a good time now is more important than thinking about what might happen "sometime."	1	2	3	4	5

e.	I much prefer doing things that pay off right away rather than in the future	1	2	3	4	5
f.	I am good at saving money rather than spending it right away	1	2	3	4	5
g.	When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible	1	2	3	4	5
h.	Sometimes I can't stop myself from doing something, even if I know it is wrong	1	2	3	4	5
i.	I frequently try to avoid courses that I know will be difficult	1	2	3	4	5
j.	The things in life that are easiest to do bring me the most pleasure	1	2	3	4	5
k.	I dislike really hard tasks that stretch my abilities to the limit	1	2	3	4	5
l.	If I had a choice, I would almost always do an easy task rather than a difficult one	1	2	3	4	5
m.	A difficult task, in most cases, is not worth doing	1	2	3	4	5
n.	I like to test myself every now and then by doing something a little risky	1	2	3	4	5
o.	Sometimes I will take a risk just for the fun of it	1	2	3	4	5
p.	I sometimes find it exiting to do things for which I might get into trouble	1	2	3	4	5
q.	I have never done anything dangerous just for the fun of it	1	2	3	4	5
r.	Excitement and adventure are more important to me than peace and security	1	2	3	4	5
s.	I often have a strong urge to be wild and crazy	1	2	3	4	5
t.	If I had a choice, I would almost always rather do something physical rather than something mental	1	2	3	4	5
u.	I almost always feel better when I am on the move rather than sitting and thinking	1	2	3	4	5
v.	I like to get out and do things more than I like to read or think about things	1	2	3	4	5
w.	I seem to have more energy and a greater need for activity than most other people	1	2	3	4	5
x.	I am not very sympathetic to other people; their problems are their responsibility	1	2	3	4	5
y.	If things upset other people, that's their problem, not mine	1	2	3	4	5
z.	I will try to get the things I want even when I know it's causing problems for other people	1	2	3	4	5
aa.	I can control myself well when I have to wait for something important	1	2	3	4	5
bb.	I can say "No" to a good time when I know there is work I have to do first	1	2	3	4	5
cc.	I don't understand why people save their money when they could enjoy it right now	1	2	3	4	5
dd.	I get bored when family members talk about "the way things used to be."	1	2	3	4	5
ee.	I think it's useless to plan too far ahead, because things hardly ever turn out the way I planned	1	2	3	4	5

Section J: Please read the following sentences and indicate the level of your agreement or disagreement.
[Scale: *Strongly disagree (6), Moderately disagree (5), Slightly disagree (4), Slightly agree (3), Moderately agree (2), Strongly Agree (1)]*

Statements		**Responses**					
a.	It is alright to fight to protect your friends/family.	1	2	3	4	5	6
b.	It is alright to beat someone who bad mouths your family	1	2	3	4	5	6

c.	It is alright to lie to keep your friends/family out of trouble.	1	2	3	4	5	6
d.	I feel it would be okay for me to cheat on an exam that I didn't have time to study for	1	2	3	4	5	6
e.	I feel it would be okay to cheat if the professor had not done an adequate job of teaching the course	1	2	3	4	5	6
f.	I would cheat to avoid getting a poor grade	1	2	3	4	5	6
g.	I would not turn-in a close friend that I knew was cheating	1	2	3	4	5	6
h.	it is ok to live in hostel without proper allotment	1	2	3	4	5	6
i.	it is alright to disobey or talk back to teachers who don't shoulder the responsibility of a true teacher	1	2	3	4	5	6
j.	Slapping and shoving someone is just a way of joking	1	2	3	4	5	6
k.	Using someone's things of daily usage without their permission is just borrowing it.	1	2	3	4	5	6
l.	It is not a bad thing to "get high" once in a while	1	2	3	4	5	6
m.	Damaging some property is no big deal when you consider that others are beating people up	1	2	3	4	5	6
n.	Corruption committed by general public is not too serious as compared to the one by politicians	1	2	3	4	5	6
o.	It is okay to insult a classmate because beating him/her is worse	1	2	3	4	5	6
p.	Compared to the illegal things people do, taking some things from a store without paying for them is not very serious	1	2	3	4	5	6
q.	Following rules does not guarantee success	1	2	3	4	5	6
r.	If kids are living under bad conditions they cannot be blamed for behaving aggressively	1	2	3	4	5	6
s.	If people are living under bad conditions, they cannot be blamed for crimes they commit	1	2	3	4	5	6
t.	A person hitting someone cannot be blamed if the opponent used rude comments	1	2	3	4	5	6
u.	A student in a group should not be blamed for the trouble the group causes	1	2	3	4	5	6
v.	A Person who only suggests breaking rules should not be blamed if others go ahead and do it	1	2	3	4	5	6
w.	It is okay to tell small lies because they don't really do any harm	1	2	3	4	5	6
x.	Teasing someone does not really hurt them	1	2	3	4	5	6
y.	Insults among friends do not hurt anyone	1	2	3	4	5	6
z.	If students fight and misbehave, it is their teacher's fault	1	2	3	4	5	6
aa.	If people are careless where they leave their things it is their own fault if they get stolen	1	2	3	4	5	6
bb.	Some people deserve to be treated like animals	1	2	3	4	5	6
cc.	Someone who is obnoxious does not deserve to be treated like a human being	1	2	3	4	5	6
dd.	Some people have to be treated roughly because they lack feelings that can be hurt	1	2	3	4	5	6

Section K: In the boxes below you are asked to choose between smaller payments closer to today and larger payments further in the future. For each row, choose one payment: either the smaller, sooner payment or the later, larger payment. 10 percent of the participants will be paid their chosen option. The choice you make could mean a considerable difference in payment (1000-500 = PKR), so choose very carefully.

Payment Alternatives	Payment Option A (pays amount below in one month)	Monthly markup rates	Payment option B (pays amount below after two months)	Preferred payment option (write A or B)
1	500	10%	550	
2	500	20%	600	
3	500	30%	650	
4	500	40%	700	
5	500	50%	750	
6	500	60%	800	
7	500	70%	850	
8	500	80%	900	
9	500	90%	950	
10	500	100%	1000	

Section L: In human social affairs, people often make a distinction in favor of or against a person based on gender, race, ethnicity, area of belonging, religious beliefs and disability rather than on individual merit. Following are a few statements related to such discriminatory acts. Indicate the frequency whether such incidence happened with you or not?

[Scale: *Never (1), rarely (2), occasionally (3), sometimes (4), frequently (5), usually (6), always (7)]*.

Statements	Frequency of occurrence						
a) How often has someone said something insulting to you because of your background?	1	2	3	4	5	6	7
b) How often have the law enforcing authorities hassled you because of your background?	1	2	3	4	5	6	7
c) How often has someone ignored you or excluded you from some activity because of your background?	1	2	3	4	5	6	7
d) How often has someone suspected you of doing something wrong because of your background?	1	2	3	4	5	6	7
e) How often has someone threatened to harm you physically because of your background?	1	2	3	4	5	6	7
f) How often have you encountered people who are surprised that you…did something really well?	1	2	3	4	5	6	7
g) How often have you been treated unfairly because of your background?	1	2	3	4	5	6	7
h) How often has someone discouraged you from trying to achieve an important goal because of your background?	1	2	3	4	5	6	7

Section M: For each statement circle the appropriate answer according to how you feel about it.
***[Scale:** Strongly agree (1), Agree (2), Neither agree nor disagree (3), disagree (4), Strongly disagree (5)]*.

Statements	Responses				
a) Laws are so often made for the benefit of small selfish groups that a person cannot respect the law	1	2	3	4	5
b) Nearly all laws deserve our respect	1	2	3	4	5
c) It is our duty to obey all laws	1	2	3	4	5
d) Laws are usually bad	1	2	3	4	5
e) The law is rotten to the core	1	2	3	4	5
f) Almost any jury can be fixed	1	2	3	4	5
g) You can't get justice in court	1	2	3	4	5
h) On the whole, lawyers are honest	1	2	3	4	5
i) Fake witnesses are often produced by the prosecution	1	2	3	4	5
j) On the whole, policemen are honest	1	2	3	4	5
k) A cop is a friend to people in need	1	2	3	4	5
l) Life would be better with fewer policemen	1	2	3	4	5
m) Policemen should be paid more for their work	1	2	3	4	5
n) Policemen are just as crooked as the people they arrest	1	2	3	4	5
o) All laws should be strictly obeyed because they are laws	1	2	3	4	5
p) The law does not benefit the common	1	2	3	4	5
q) The law as a whole is sound	1	2	3	4	5
r) In the long run law and justice are the same	1	2	3	4	5
s) The law enslaves the majority of people for the benefit of a few	1	2	3	4	5
t) On the whole judges are honest and kindhearted	1	2	3	4	5
u) Court decisions are almost always just	1	2	3	4	5
v) Almost anything can be fixed in the courts if you have enough money	1	2	3	4	5
w) A judge is a good person	1	2	3	4	5
x) Our society would be better off if there were more policemen	1	2	3	4	5
y) Police rarely try to help people	1	2	3	4	5
z) Sometimes a guy like me has to break the law in order to get ahead	1	2	3	4	5

aa) Most successful people used illegal means to become successful	1	2	3	4	5	
bb) People who have been in trouble with the law have the same sort of ideas about life that I have	1	2	3	4	5	
cc) A person should always obey the law no matter how much it interferes with his personal ambition	1	2	3	4	5	
dd) I would rather associate with people that obey the law than those that don't	1	2	3	4	5	
ee) It's alright for a person to break the law if he doesn't get caught	1	2	3	4	5	
ff) I'm more like the people who can make a living outside the law than I am like those who only break the law occasionally	1	2	3	4	5	
gg) Most people would commit crimes if they know they wouldn't get caught	1	2	3	4	5	
hh) People who have been in trouble with the law are more like me than people who don't have trouble with the law	1	2	3	4	5	
ii) There never is a good cause for breaking the law	1	2	3	4	5	
jj) I don't have much in common with people who never break the law	1	2	3	4	5	
kk) A hungry person has the right to steal	1	2	3	4	5	
ll) It's alright to circumvent the law if you don't actually violate it	1	2	3	4	5	
mm) Anyone who breaks the law cannot be my friend	1	2	3	4	5	
nn) A person should obey only those laws which seem reasonable	1	2	3	4	5	
oo) A person is a fool to work for a living if he or she can get by some easier way; even if it means violating the law	1	2	3	4	5	

Section N: People come into contact with the criminal justice system for a variety of reasons. Thinking about the past 2 years, please indicate whether you have personally (Please select all that apply):

***[Scale:** Never (1), rarely (2), occasionally (3), sometimes (4), frequently (5), usually (6), always (7)]*.

Statements	**Frequency of occurrence**						
a) Been in a vehicle that was stopped by police/other law enforcing agency	1	2	3	4	5	6	7
b) Known someone well who was the victim of a crime	1	2	3	4	5	6	7
c) Served on a jury	1	2	3	4	5	6	7
d) Been imprisoned or known someone who was imprisoned	1	2	3	4	5	6	7
e) Been a victim of crime	1	2	3	4	5	6	7
f) Attended court as a witness or support person	1	2	3	4	5	6	7
g) Been arrested by police	1	2	3	4	5	6	7

h) Worked in the system or known someone who does	1	2	3	4	5	6	7
i) Other (please specify) _____	1	2	3	4	5	6	7

Section O: Read the following statements and tick the relevant box against each one.

[Scale: *Very untrue (1), Untrue (2), Somewhat untrue (3), Neutral (4), Somewhat true (5), True (6), Very true (7)]*.

Statements	**Responses**						
a) It's a cruel world	1	2	3	4	5	6	7
b) The world is a jungle and you have to struggle to survive	1	2	3	4	5	6	7
c) I can't get ahead because others hold me back	1	2	3	4	5	6	7
d) I always know that I'll be treated unfairly	1	2	3	4	5	6	7
e) My community is a pleasant place to live	1	2	3	4	5	6	7
f) Life is difficult and dangerous	1	2	3	4	5	6	7
g) My future looks bright	1	2	3	4	5	6	7
h) Most people can be trusted	1	2	3	4	5	6	7
i) People will take advantage of me if I give them the chance	1	2	3	4	5	6	7
j) My life is a constant struggle	1	2	3	4	5	6	7
k) I feel angry toward others	1	2	3	4	5	6	7
l) I feel like I live in a war zone	1	2	3	4	5	6	7
m) People will hurt me if given the chance	1	2	3	4	5	6	7
n) I do not get what I deserve	1	2	3	4	5	6	7
o) My life has been a lot worse than most people in this society	1	2	3	4	5	6	7
p) People treat me like I am worthless	1	2	3	4	5	6	7
q) I am not living the kind of life I want	1	2	3	4	5	6	7
r) People often do things that upset or anger me	1	2	3	4	5	6	7

s) I get frustrated when I see what many other people have	1	2	3	4	5	6	7
t) I am worried about becoming a victim of crime	1	2	3	4	5	6	7
u) Our quality of life is badly affected by the fear of crime	1	2	3	4	5	6	7

Section P: In the table below, each decision contains a choice between two lotteries (A and B). If you chose A in the first row, it says that you have 10% chances of winning 580 and 90% chances of winning 480. But if you chose B in the first row, then you have 10% chances of receiving 1200 and 90% chances of receiving 36. Again, the choice you make could mean a considerable difference in payment, so chose very carefully.

Lottery A	**Lottery B**	**Preferred lottery (chose A or B)**
10% of 580 and 90% of 480	10% of 1200 and 90% of 36	
20% of 580 and 80% of 480	20% of 1200 and 80% of 36	
30% of 580 and 70% of 480	30% of 1200 and 70% of 36	
40% of 580 and 60% of 480	40% of 1200 and 60% of 36	
50% of 580 and 50% of 480	50% of 1200 and 50% of 36	
60% of 580 and 40% of 480	60% of 1200 and 40% of 36	
70% of 580 and 30% of 480	70% of 1200 and 30% of 36	
80% of 580 and 20% of 480	80% of 1200 and 20% of 36	
90% of 580 and 10% of 480	90% of 1200 and 10% of 36	
100% of 580 and 0% of 480	100% of 1200 and 0% of 36	

Thank you for taking time out to participate and complete the survey. We truly value the information you have provided.