Dynamics of Crime, Tertiary Education, Quasi Democracy and Misery Index in Pakistan: A Time Series Analysis

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Abstract

The volatility of the crime rate has been strongly contiguous with the series of socio-economic factors in Pakistan, along with the varying contribution across two distinct government regimes. The said study conducted for the purpose of tertiary education, enrollment rate, inflation, urban population growth rate and level of unemployment on the increasing crime in the community of Pakistan. A statistical test was adopted for the calculation of the education and crime period in the country from 1965 to 2018. It is evident from the reserch that the higher education impact on the control of crime in the community. However the increase in the urbanization, is adverly effecting the crime in the country.Therefore, policy to reduce crime rate is that a specific interventions are required for the promotion of Tertiary Education and stability of democracy for longer period of time. For reducing misery and rural-urban migration of the people, it is necessarily required to achieve considerable higher inclusive growth while transmitting its fruits to the deprived rural segments. A smooth policy may also be devised for the provision of basic necessities & facilities of life at the door step of rural segment of the country to avoid the devastating rural- urban migration which will help to reduce the various categories of crimes.

Keywords: crime rate; Oken,s Misery Index & Barrow,s Misery Index; tertiary education; democracy; Pakistan.

Introduction

The devastating crime statistics have posed a significant challenge to the developing world's dream of sustainable development. The least developed economies have suffered horribly as a result of several factors, including poor law and order, unemployment, poverty, rising food prices, a lower level of education, political instability, and income disparities (Buonanno, 2003; Coomer, 2003; Habibullah and Baharom, 2008). The crimes started in this universe since the advent of human beings. Unluckily, the very first crime on earth was committed by

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the elder son of Adam and Eve, "Qabeel," by killing his younger brother "Abele" due to undue resentment (Gillani, Rehman, and Gill, 2009; Liu, Amin, Rasool, and Zaman, 2020; Gillani, Khan, and Gill, 2011).Similarly, Khan, Ahmed, Nawaz, and Zaman, (2015) described that the crime word originated from the Latin word "Crimen," which means social evil that could not be completely ruled out from an individual's life but could be minimized.

The literature exhibits various factors that create and perpetuate the magnitude of the crime. According to Fleisher (1966), increasing unemployment rate and low income have been significant causes of crime in an economy. Becker (1968) presented the rational behavior of criminals through a cost-benefit analysis, stating that the primary driver of rising crime in a society is a higher utility from illegal activity than from legal activity. The main factor contributing to increased crime is the unequal distribution of resources (Brush, 2007). Furthermore, Fajnzylber, Lederman and Loayza, 2002) and Maddah (2013) show that greater income inequality causes more crimes to be committed in Less Developed Countries (LDCs).

Moreover, (Coomer, 2003; Gümüş, 2004; Tang and Lean, 2007; Teles, 2004) pointed out that, increase in the inflation, is also directly effect on the increase on the crime. In contrast (Buonanno and Leonida, 2005; Lochner and Moretti, 2004) asserted that crime is a negative externality that can be reduced by increasing people's educational levels. Similarly, Cerro and Ortega (2012) discussed that rising GDP per capita is also one of the helpful gadgets to reduce criminal activities in third-world countries.

Every region of the world has experienced some degree of devastation caused by crimes, which is a well-known fact. The division of the world had exacerbated the unequal distribution of resources at different levels into developed and developing nations, which gave rise to various types of crimes like murder, kidnapping, stealing cattle, and kidnapping with minors as a target. However, the devastating impact of all these criminal activities has been more severe in developing countries, particularly in Pakistan, where there has been a significant increase in reported crime. Table 1 provides an overview of different crimes committed in Pakistan by decade.

Table-1 Ten Years Average of Different Crimes in Pakistan (1971 to 2018)

Years	Murder	Attempt to Murder	Kidnapping /Child	Robbery/Burglary/Dacoity/	Cattle Theft	All Reported	Crime Growth

			Lifting	Others		Crimes	Rate
1971-80	4965	7340	3246	93178	6097	114826	-
1981-90	6054	9906	3733	202757	4835	227285	97.93
1991-00	8626	11649	6795	311049	6547	344666	51.64
2001-10	10599	13257	11194	457199	8694	500943	45.34
2010-18	11665	13370	19155	596415	8911	649516	29.66

Source: National Policy Bureau, Ministry of Interior

Table 1 depicts the various crimes committed in Pakistan over the last 48 years. The reported statistics on all crimes show that Pakistan's economy has seen an upward trend over time in all categories. According to statistics, there were 114826 crimes reported in Pakistan overall in the 1970s. This number rose to 227285 in the 1980s, 344666 in the 1990s, 500943 in 2000, and 649519 in the decade of 2010. Therefore, the decade-by-decade growth rates of crime from 1970 to 2010 have been estimated to be 97.93%, 51.64%, 45.34%, and 29.66%, respectively. This also illustrates an upward trend in reported crimes with a downward trend in rates over the past five decades. According to the literature, nearly 40% of crimes such as bank fraud, tax evasion, computer and cell phone crimes, snatching, and street crimes are not reported in Pakistan (Khan et al., 2015).

Whereas, many of the study, already identified the nature and relationship between education and crime. Moreover, the crime rate can be controlled with help of education. (Gillani et al., 2011; Haider and Ali, 2015).still, there have been few missing links in the existing studies. Follwings phenomena can leads toward the control of crime in pakistan and at interational level.

i.   The time spend in the school.
ii.   Relationship between tertiary education and crime.
iii.   Policy matter with the linkange of education.

Literature Review

The scanning of existing relevant literature provides theratical roots to the accomplish the question in han. In this segment, an inclusive array of earliear studies has been discussed which employes variety of the methodologies and highlights the significance the crime rate & its determinants at the nationa as well internation levels. Some of the important studies have been reviewed briefly as below;

Ahad (2016) examined the dynamical linkages between crime, poverty, inflation and income disparity in Pakistan for the period 1984 to 2012 by using ARDL bound testing analytical method and found that collectively crime, poverty, income disparity and inflation are co-

integrated with each other. However, it has been broadly noted that all the regressors positively influenced the crime rate in Pakistan.

Buonanno and Leonida (2005) also identified the relationship of the education and crime and it was ponited that the edution is only single and major source, which can help in the controlling of the crime from the society. The study suggested to improve the education for considerable reduction in crimes.

Tan and Lean (2007) examined the determinants of crime rate in USA through the bound test ARDL for the period 1960 to 2005 and found a significant association among the variables. However, individual impact of each variable depicts that both inflation and unemployment rate in long and short run leads to upsurged the crime rate in study area.

Tang (2009) explored the linkages amid crime, inflation and unemployment in Malaysia, using the annual data since 1970 to 2006 and employed Johsnsen co-integration statistical method. Estimated empirical outcomes significantly evaluated that variables of the study are co-integrated. Thus, separately each estimated co-integrating vector demonstrated that inflation and unemployment are positively associated to the social dilemma of crime rate.

It was revealed from the study R and Ullah (2014) that the association of the education and crime is interlink with each others. However, with the increase, in the education, the crime can be reduced from the society. Education can also be help in the controlling of the inflation pressure on the individuals and it will help to uplift the standrs of the community member. It was concluded from the study that, the education is only the key tools to control the inflation abd crime from the society. However, it revealed through the results that in longer and shorter span of time increasing inflation, female employment and income disparity devasted the rate of crime in Pakistan.

Methodology

The methodly for this study was adopted by the reserch is empirical analsysis and the for the purpose of that the time series data was taken fromt 1965 to 2018. The data has been collected from the different sources of the data. The details of these sources areas:

i.   World Development Indicators (WDI).
ii.   International Monetray Fund (IMF).
iii.   Pakistan Bureau of Statistics (PBS)

Moreover, the the first part consists of estimations of misery indices like OMI (Okun's Misery Index) and BMI (Barrow Misery Index) and crime rate, while the second part extensively describes the

econometrics approach to explore the long run and short run linkages among the variables of the study.

Theoretical View of Misery Index and Crime Rate

Primarily, the concept of the misery index was presented by economist Arthur Okun in the 1970s in an elementary version. Formally, it is known as Okun's Misery index (OMI). The measure consists of two essential elements, i.e., The annual inflation rate of the any country with the total number of population of the country. Usually, it is derived as below:

$$OMI_t = \Pi_i + \Omega_i ....(1)$$

Where OMI presents Okun's Misery index, Π_i is the annual inflation rate, and Ω_i indicates the yearly unemployment rate. Later on, 1990s, Robert Barrow presented another class of misery index known as Barrow's misery index, consisting of Okun's Misery index and two additional elements, real GDP growth rate and long-term interest rate. However, the measurement of a particular index incorporates the value at their first difference instead of level. Generally, Barrow Misery Index is written as follows;

$$BMI_t = \Delta OMI_t + \Delta \tau_t - \Delta GDP_g ....(2)$$

Where BMI_t and ΔOMI_t represent Barrow and Okun's misery Index, while '$\Delta \tau_t$' demonstrates the long-term interest rate and ΔGDP_g is the annual GDP growth rate of the country (Kolaneci et al., 2016; Lechman, 2009). Finally, it is measured by dividing all the reported crimes overpopulation by 10,000 (Saboor et al., 2017).

$$CR_T = \frac{Total\ \text{Re}\ ported\ Crime}{(Populations/10,000)}$$

$$...(3)$$

Specification of Crime Model

The specification of a crime model has been developed for analyzing the relationship between key variables such as tertiary education and the misery index in Pakistan's two distinct regimes, quasi-democracy and quasi-dictatorship. The general form of the model is presented below:

$$CR_{T=}f \quad (OMI, \quad BMI, \quad TE, \quad QD, \quad and \quad Upop)$$
$$...(4)$$

Where OMI and BMI are Okun's and Barrow Misery Index, while TE is the Tertiary Education enrollment rate per year, QD donates for dummy variable of Quasi Democracy, and Upop stand for urban population growth rate. However, in order to examine the accurate picture of the economy, two distinct models for the misery index (OMI and BMI) have been estimated. The linear regression model is generally described as follows:

$$CR_T = \delta_o + \delta_1 t + \sum_{i=1}^{q} \delta_i X_i + \mu_i ....(5)$$

Where CR_T represented the crime rate per ten thousand populations and employed as a dependent variable in the model, hence, X_i indicates the set of all independent variables of the model that includes Okun's Misery Index (OMI), Barrow Misery Index (BMI), Tertiary Education, Quasi Democracy and urban population growth. Similarly, subscript "t" demonstrates a dynamic trend, and μi is error term that captures the impact of exogenous variables that are not included in the model. Finally, δ_o, δ_i, δ_1 represents the intercept, slope coefficients, and coefficient of time-variant trend 't' in the models, respectively.

Stationary Test

The stationarity problem has been examined through the well-known unit root tests, Augmented (Dickey and Fuller, 1979; PERRON, 1988). However, a structural break exist in the data series may disturb the outcomes of traditional unit root tests and lead to unreliability. Thus, the current study also employed Zivot and Andrews (2002) unit root test to check the stationary and breakpoint at the level and the first difference. However, the statistical package of E-views exhibits the value of the structural break test at the level and for the measurement of stationary condition at first difference. In order to calculate the results, it is technically necessary to convert the variables at first difference and then use the structural break unit root statistics.

Description of Autoregressive Distributed Lag Model (ARDL)

The Autoregressive Distributed Lag (ARDL) bound testing approach was applied on the said study. The application of this model are described below. The model areas: The general form of the long-run model is as follows:

$$CR_T = \beta_0 + B_1 t + \sum_{i=1}^{q} B_2 CR_{T-i} + \sum_{i=0}^{p_1} \beta_3 OMI_{T-i} + \sum_{i=0}^{p_2} \beta_4 TE_{T-i}$$

$$+ \sum_{i=0}^{p_3} \beta_5 Upop_{T-i} + \eta QD_T + \mu_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

The same equation is also re-specified for Error Correction Mechanism (ECM) to estimate the short-run coefficients. Generally, it is derived as below:

$$\Delta CR_T = \alpha_0 + \alpha_1 t + \sum_{i=1}^{q} \alpha_2 \Delta CR_{T-i} + \sum_{j=1}^{p} \alpha_3 \Delta OMI_{T-j} + \sum_{k-1}^{p} \alpha_4 \Delta TE_{T-l}$$

$$+ \sum_{l-1}^{p} \alpha_5 \Delta Upop_{T-l} + \sum_{m-1}^{p} \lambda_6 QD_{t-m} + \varphi_7 ECM_{t-1} + v_t \dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

The both the model are used in the time series analysis, for the concusion of the results of edution, crime rate, inflation and urbanization.

Results and Discussion

It was evident from the above numeric data and literature review on the crime and education. The time series analysis, only be applicable in the form of unit root, which is the basis and prerequist to examining the series of the variable at the time of selection. The literature presents several unit root tests, such as Augmented Dickey-Fuller (Dickey and Fuller, 1979; Elliott, Thomas and Stock, 1996; Ng and Perron, 2001; Perron, 1988), to address the problem of stationarity. However, the Augmented Dickey-Fuller (ADF) and Philip Perron (PP) are well-accepted and frequently used unit root measures. Thus, the current study has employed both techniques. The results of both techniques persented in table 2.

Table-2 Unit Root Analysis: The Stationarity of Data

Variables	Exogenous	ADF Test	PP Test	P-value	Decisions
CR_T	Drift & Trend	-8.45*	-8.48*	0.000	*I(1)*
OMI	Drift	-3.79*	-3.75*	0.005	*I(0)*
BMI	Drift	-3.06**	-3.05**	0.036	*I(0)*
TE	Drift & Trend	-4.79*	-4.68*	0.002	*I(1)*
Upop	Drift	-3.28**	-3.27**	0.02	*I(1)*
Democracy	-	-	-	-	-

*, **, *** are 1%, 5% and 10% level of significance

Table 2 indicated about the relationship between crime, edution, inflation and urbanization.

Table-3 The Outcomes of Zivot and Andrew Structural Break Unit Root Test

Variables	Exogenous	At Level		At 1st difference		Decision
		T-Value	Time Break	T-Value	Time Break	
CR_T	Drift & Trend	-3.26	1975	-6.20*	1977	I(1)
OMI	Trend	-5.22	1976	-5.24*	1976	I(1)
BMI	Trend	-3.32***	2009	-8.57*	1975	I(0)
TE	Drift & Trend	-3.46	1999	-6.46*	2004	I(1)
Upop	Drift	-3.31**	1988	-6.33*	1981	I(0)
Democracy	-	-	-	-	-	-

*, **, *** are 1%, 5% and 10% level of significance

The findings of Zivot and Andrew's structural break unit root test reveal a distinct pattern order of integration variables, BMI and urban population growth rate are integrated at *I (0)* with the structural break period between 2009 and 1988. While on the other side crime rate, OMI, and tertiary education are integrated at *I (1)* with structural break period 1977, 1976, and 2004, respectively, and none of the variables is integrated at *I (2)*. Meanwhile, distinctive level of integration significantly provides strong evidence for applying the ARDL bound testing co-integration approach (Liu, Amin, Rasool and Zaman 2020). At the same time, selecting the appropriate lag length for any co-integration

model is also important. Therefore, VAR lag length selection criteria have been used for the current study to find the appropriate lag length (Maddah, 2013). According to the estimated results, the maximum number of criteria suggests that opposite lag length "2" for the present analysis. However, the present study employed "2" lags length for the estimation of ARDL outcomes by following the well-reputed AIC information criteria.

Table-4 Selection of Appropriate Lag Length for the Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-498.3316	NA	381.4218	20.13326	20.32447	20.20608
1	-212.4772	503.1038	0.011283	9.699087	10.84630*	10.13595
2	-170.0977	66.11199	0.005806*	9.003907*	11.10713	9.804827*
3	-155.4471	19.92479	0.009514	9.417884	12.47712	10.58286
4	-121.4230	39.46802*	0.007785	9.056918	13.07217	10.58595

This table indicated the result of table -5. It also inmdicated the multiple variation and multipe causes of the crime in the society as well. According to Shahbaz, Lean and Shabbir, (2012), when variables of interest are showing different integration schemes at $I\ (0)$ and $I\ (1)$ with uni-directional causality, then the uni-variate model of ARDL is the appropriate approach for finding of the relationship of the long run and short run.

Table-5 Calculated Outcomes of Granger Causality Test

Null Hypothesis	Direction of Causality	Lags	F-Test	Prob.
TE to CR_T	Single Directional	2	3.33**	0.045
CR_T to TE	No Reverse Causality	2	2.36	0.106
OMI to CR_T	Single Directional	2	16.30*	0.000
CR_T to OMI	No Reverse Causality	2	1.33	0.276
BMI to CR_T	Single Directional	2	8.30*	0.000
CR_T to BMI	No Reverse Causality	2	1.50	0.235

*, **, *** 1, 5 and 10 percent Level of Significance

Table 6 persents the out comes of the bound test approach, to examine the presence of a long-run relationship, the *F*-statistics of Pesaran et al. (2001) and T-statistics of Banerjee (1998) have been estimated, confirming the crime rate, OMI, BMI, and tertiary education enrollment rate are co-integrated with each other in Pakistan in both models. The estimated *F*-value (T-value) of the models, i.e. [13.51 (6.46)

& 10.08 (6.33)], were found to be greater than the upper critical bound measures at 5% level of significance. The results are consistent with Nazir, Nazir, Hashmi and Ali, (2018), who designates that variables reveal a stable long-run relationship when the calculated F-value is greater than the upper critical bound at any of the discussed significance levels; it is 5% or 10%.

Table-6 Co-Integration outcomes of Bound Test ARDL Approach

Critical Bound	Critical Measures at 5% Level of Significance	Critical Measures at 10% Level of Significance
F- Test Bound Measures	K=4	
Lower Bound	3.82	3.25
Upper Bound	5.01	4.32
T- Test Bound Measures		
Lower Bound	-3.41	-3.13
Upper Bound	-4.36	-4.04
First Model of OMI	F-Stat=12.21	T-Stat=6.46
Second Model of BMI	F-Stat=10.26	T-Stat=6.33

This clacualtion is made, on the basis, Microfit-5 and E-views 10.

The table No-7 of ARDL is refleting the long run and short rum results of the study. This also refletingt the long run crime rate and short run crime rate with its relation, with the education and inflation. At the same time, the impact of tertiary education (TE) and democracy were found to be inverse at 1% and 5% significance in Models 1 & 2. Initially, the experiential outcomes of model 1 demonstrate that an increase in tertiary education enrollment considerably leads to a decline in the crime rate (0.872) because more enrollments make a higher number of students while raising the opportunity cost of crime for them. Consequently, it leads to a decline in the crime rate in Pakistan. These measures are consistent with earlier studies (Fella and Gallipoli, 2014; Gentry, Mokkapati and Rampersad, 2016; Lochner and Moretti, 2004; Witte and Tauchen, 1993), where negative linkage had been found between high school education level and crime rate.

Similarly, the impact of democracy also depicted as negative on the crime rate (3.210) because democratic governments are people-friendly; thus, political stability leads to the country's overall development, boosting GDP per capita growth. A particular increase in GDP per capita growth makes people financially stronger on one side. It lowers the unemployment rate, on the other side, ultimately declining the utility of unlawful activities compared to legitimate activities and

causing a significant reduction in the thrust of crimes (Tang, 2009). Secondly, a strong democracy and long-term political stability are highly supportive of developing strong, strict, and long-term laws to control various categories of crimes. These outcomes are consistent with Lin (2007), who also found an inverse linkage between a stable democracy and the crime rate.

Contrary to the above, the impact of Okun's misery index on crime has been positive at a 1% level of significance which reveals that an increase in the misery of the people uplifts criminal activities (0.926) and makes people more violent. It reveals that a stable long-term democratic regime in Pakistan helps to mitigate the magnitude of the crime rate twofold. Firstly, in the form of continuity of policies to promote different types of education (primary, secondary, tertiary, and Skill education) in particular developing economies. Secondly, such an environment also encourages investment in the country, which causes to reduce the misery of the people by uplifting the earning avenues and the wage rate. It was concluded that the govermnet needs to control the urbanization for the control of the crime in the over populated country.

Table-7 Estimation of ARDL Bound Test Model: Long Run and Short Run Analysis

	Model 1 for OMI	Model 2 for BMI
Selected Design of ARDL Model	(2,2,0,0,0)	(1,2,0,0,0)
Long Run Calculations of ARDL Model		
MIs	0.926 * (0.268)	0.508*(0.121)
TE	-0.872**(0.381)	-0.475(0.398)
Upop	9.12* (2.031)	9.22*(1.839)
Demo	-3.210** (1.584)	-3.44**(1.472)
Trend	0.842* (0.110)	0.785*(0.104)
C	-38.544* (8.542)	-36.392*(7.873)
R-Squared	0.96	0.95
Adjusted R Squared	0.95	0.93
F-Test	101.15(0.000)	95.96(0.000)
D-H Statistics	--	-0.6011(0.548)
Short Run Calculations of the Model		
$\Delta CR_T(-1)$	-0.164(0.115)	--
ΔMIs	-0.029(0.084)	-0.045(0.069)
$\Delta MIs(-1)$	-0.433*(0.0901)	-0.196**(0.075)
ΔTE	-0.542***(0.282)	-0.351(0.312)
$\Delta Upop$	5.674*(1.794)	6.823*(1.785)

Dynamics of Crime		Aadil,Asif,Ghanzanfar
ΔDemo	-1.997**(0.899)	-2.548**(1.055)
Trend	0.524* (0.144)	0.581*(0.135)
ECM(-1)	-0.622*(0.117)	-0.739*(0.117)
R-Squared	0.64	0.57
Adjusted-R Squared	0.57	0.50
F-Test	9.52 (0.000)	8.23(0.000)
D. Watson Statistics	2.10	2.08
Diagnostic Measurements of ARDL		
Serial Correlation LM Measures	1.357(0.244)	0.364(0.546)
ARCH Effect	1.8280(0.176)	2.557(0.110)
Ramsey Model Specification Test	0.588(0.443)	1.9166(0.166)
Residual Normality	1.316 (0.518)	1.293(0.516)

Model 1 & 2 represents the outcomes with OMI and BMI misery indices, *, **, *** are representative of 1, 5 and 10% levels of significance

Parallel to the long run estimations, the outcomes of the short run also present almost similar tendencies with a negative sign (insignificant) impact of TE & democracy (misery index) and a positive impact of urbanization on the education. It has been noted that an upsurge in inflation and unemployment has not been a severe problem for the common person in the shorter period. Therefore, to mitigate the crime rate, the government may focus on improving the TE and diminishing urbanization, which is only possible by providing higher education facilities to the rural population at their doorstep (Lochner and Moretti, 2004). Similarly, the provision of various subsidies may enable them to enjoy the basic facilities of life.

Likewise, the accuracy of the model, structural stability of the data, and reliability of coefficients have been examined to validate the calculated outcomes. The stepwise measure reveals that all the predicted parameters significantly impact the response variable because calculated F-statistics (101.15) are highly significant at 1%. Similarly, the estimated R-square also validates the overall significance, which shows that 96% variation in the crime rate is due to the explanatory variables under consideration, while the remaining 4% is because of other exogenous factors that are not included in the model. In line with the value of R-Square, all the diagnostic tests favor the estimated parameters.

Likewise, the R-square and F statistics validate the overall goodness of fit of the model and overall significance, while diagnostic tests and structural stability of the data also endorse the empirical findings. All the diagnostic test satisfies the estimated parameters as none of the assumptions of OLS is violated. Similarly, the structure stability reveals that both CUSUM and CUSUM's Square measures exist within a 5% critical bound that guarantees data validity. Finally, the ECM measure of the BMI model identifies the higher speed of adjustment toward the equilibrium. The estimated results indicate that about 74% of the disequilibrium will be corrected next year.

Plot of Cumulative Sum of Recursive Residuals
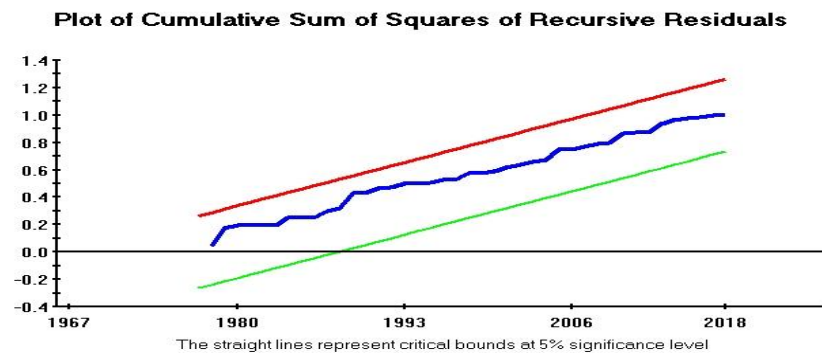
The straight lines represent critical bounds at 5% significance level
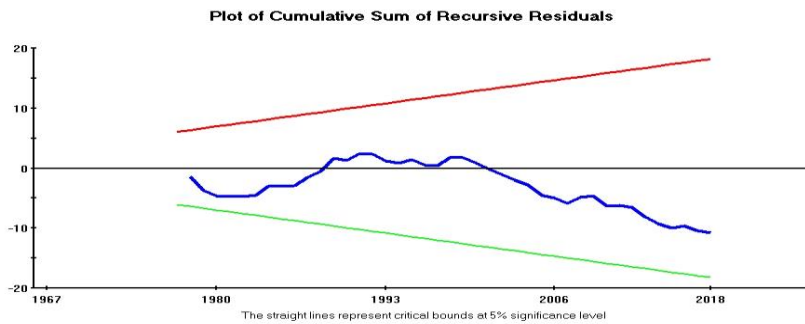
Figure-1 CUSUM Estimate of OMI Model

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Figure-2 CUSUM Square Estimate of OMI Model

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Figure-3 CUSUM Estimate of BMI Model

Plot of Cumulative Sum of Squares of Recursive Residuals
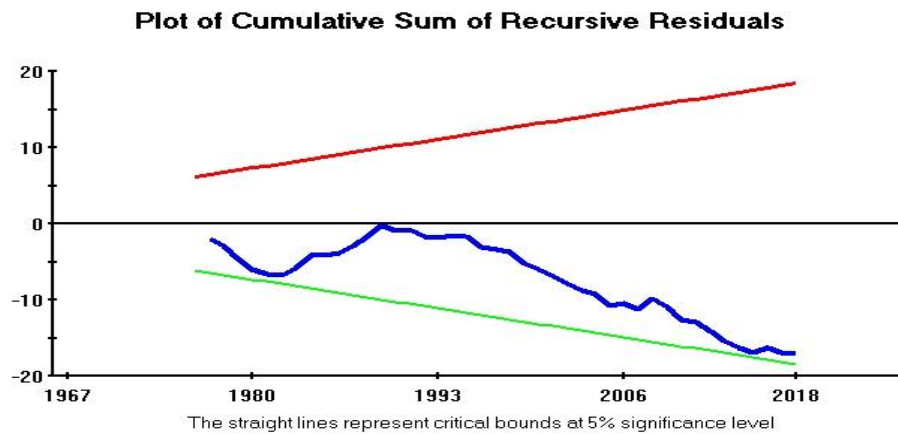

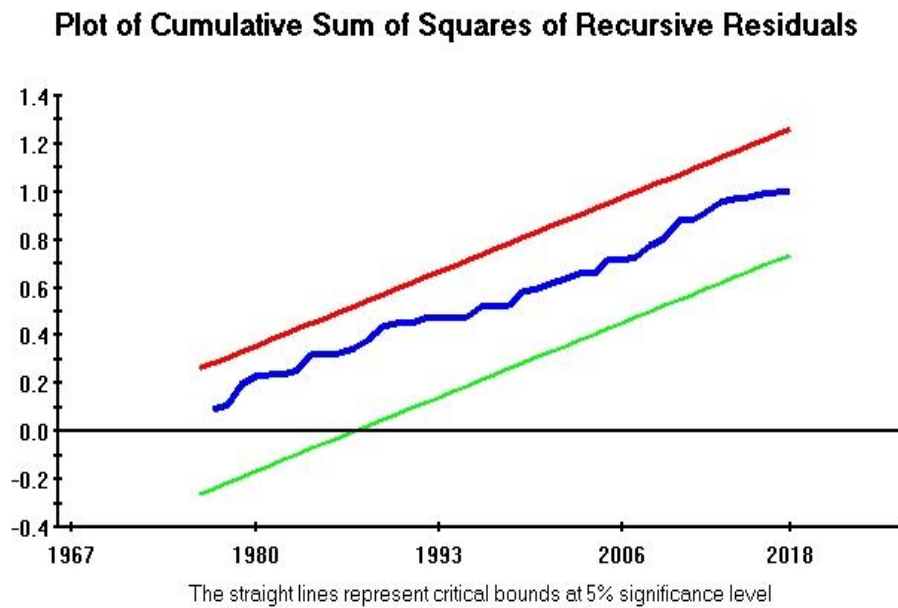The straight lines represent critical bounds at 5% significance level

Figure-4 CUSUM Square Estimate of OMI Model

However, FMOLS is frequently used due to some of the additional advantages. For example, it is free from endogeneity problems, and second, it is a valid measure for a small sample size (Stock and Watson, 1989). Both of the measures (DOLS & FMOLS) are presented in table 8. These findings are consistent with ARDL results and have similar signs, thereby validating the appropriateness of the outcomes of the ARDL model.

Table-8 Robustness Calculations of Both Models to Validate ARDL Measurements

Variables	OMI Model		BMI Model	
	DOLS	FMOLS	DOLS	FMOLS
MIs	0.32** (0.144)	0.050 ** (0.017)	0.280* (0.094)	0.13*** (0.07)
TE	-1.16* (0.356)	-1.509* (0.328)	-0.818** *(0.420)	-1.22*(0.34)
Demo	-0.056** (0.022)	-1.09** (0.53)	-1.41**(0.70)	-0.09** (0.048)
Upop	10.30* (1.681)	10.44* (1.88)	10.37* (1.82)	10.24* (1.84)
C	-38.53* (7.015)	-36.10* (8.04)	-38.54* (7.71)	-36.10* (7.88)
Trend	0.932* (0.098)	1.02* (0.08)	0.837* (0.114)	0.944* (0.08)

Figures in parenthesis are estimated Std. Errors while *, **, *** are representatives of 1%, 5% and 10% level of Significance

Conclusions

Several socio-economic aspects have created and perpetuated the magnitude & thrust of the overwhelming crime rate throughout the developing globe. Across multiple factors, education, population growth, inflation, and unemployment had been most prominent to magnify the extent of the problem in the country. Primarily, this paper has estimated the relationship of the education with crime and inflation with crime as well. It was also concluded fromt the time series analsysis and the result of the study, included the literature review of the study, that the urbanization is also one of the major factor. The urbanization is occurs due to the lack of opportunites in the rural area, the urbanization in increasing the pressure of inflation, which leads toward the crimeIn the first stage, estimating TE and democracy reveals that both impacts favor reducing the crime rate over a longer and shorter period. The outcomes of model-2 advocate that democracy and improvement in TE mitigate the crime rate in Pakistan, while the impact of BMI and urban population growth rate has been found adverse. However, the effectiveness of the indicators of the 2nd model is smaller than the 1st model, indicating the inclusion of the GDP growth rate helps reduce misery. Likewise, the reflections of the short-run demonstrate an almost similar trend with an

insignificant impact on the misery index, which shows that the people of Pakistan are non-violent in the short run.

Policy Implications of the Study
The findings of the study areas:

- The government may focus on political stability and devise consistent long-run policies to promote TE to overcome the devastating crime rate. Thus, the upgradation of technical & vocational institutes with highly skilled faculty and adding new degree programs may be helpful to enhance the tertiary education enrollment rate that inversely relationship with the crime in country.

- The consistency of the democratic regimes may help to promote higher education facilities in Pakistan. In addition to this, the adequate share of education expenditure at the national level, particularly for the highly deprived area,s may be prioritized.

- Similarly, it is imperative to address the misery index and urbanization also adversely affect the crime rate in the country. Thus, there is a dire need to lessen the rural-urban migration through the provision of area-specific job provision and basic facilities that lead to minimizing disparities among the sub-groups of the population. Secondly, it is only possible when fruits of growth are equally & proportionally transmitted towards the lower income quintile of the rural segment..

- Therefore, it is concluded that stability in democracy, provision of higher education at the local level, and reduction in rural to urban migration are necessary to overcome the crime rate in a particular period.

Limitations of the Study
The nonavailability of consistant time series information has been a serious constrat to devise meaningfull findings.

Directions for Future Research
The identifican of the correlates of widespread misery, overwhelming inflation & unemployment and widening poverty & inequality may be probed in the future research endevours for the effectiveness of policy matrix to mitigate the magnitude of crimes in the country.

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