

**Economics, Law Enforcement and
Crime Connection
[A Longitudinal Data Approach]**

by

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Introduction

- Becker (1968)
- Isolation of variables in crime model at sub national level
- monotony to check the existence of long run relationship using time series
- Role of deterrent variables in crime model has been ignored.
- Ambiguity to claim either increase in police strength has deterrence effect on crime rate or not.

Objectives

- To examine the effect of law enforcement, socio-economic and demographic variables on crime rate.
- To see whether the relationship between police strength and crime varies across the divisions of Punjab
- Does effect of police strength depends upon some specific characteristics like urbanization

LITERATURE REVIEW

Authors and year	Methodology	Findings
Becker (1968)	Theoretical framework of economic model of crime	Criminal and law enforcement agencies are rational
William et al (1994)	panel data approach	Proportion of young male and minority in total population has a positive while increase in police strength has a negative impact on crime rate
Entorf and Spengler (2000)	static and dynamic panel data	socio-economic and demographic factors have strong influence on crime
Ejaz et al (2009)	Time series- Johenson cointegration approach	unemployment rate, poverty and inflation are granger cause of crime in Pakistan

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Hanzla Jalil (2010)	Johenson cointegration approach	Lack of planning regarding to the expansion of urban areas increases crime rate while literacy rate and unemployment has a significant and negative impact on crime rate of the country.
Jabar S.M (2014)	Johenson cointegration approach	Measuring error problem in crime data and High conviction rate and education have significant negative impact on murder crime rate while the impact of unemployment on violent crime is ambiguous.

Theoretical Framework

- Rational economic theory
- Choice between committing and not committing some criminal activity depends upon the net-payoff (φ_i).

$$\varphi_i = G_i - C_i$$

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

$$\varphi_i > 0$$

Empirical Procedures

- *Crime = f (police Strength, untraced criminal cases, population growth rate, economic activity, education)*
- *Fixed Effect Model*

$$C_{it} = c_i + \alpha X_{it} + u_{it} \quad (1)$$

$$C_{it} = c_i + \alpha_1 UT_{it} + \alpha_2 PS_{it} + \alpha_3 EA_{it} + \alpha_4 Ed_{it} + \alpha_5 Pop_{it} + u_{it} \quad (2)$$

t= 2008.....2012 ; i= 1, 235

- Untraced criminal cases has been taken as the ratio of untraced criminal cases to total registered criminal cases.
- Number of Police stations available to per thousand member in each district has used as a proxy to measure police strength

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- Number of factories available to per thousand people in each district has been used to represent the state of economic activity
- Socio-economic and demographic effects have been captured by literacy rate and population growth variables respectively.

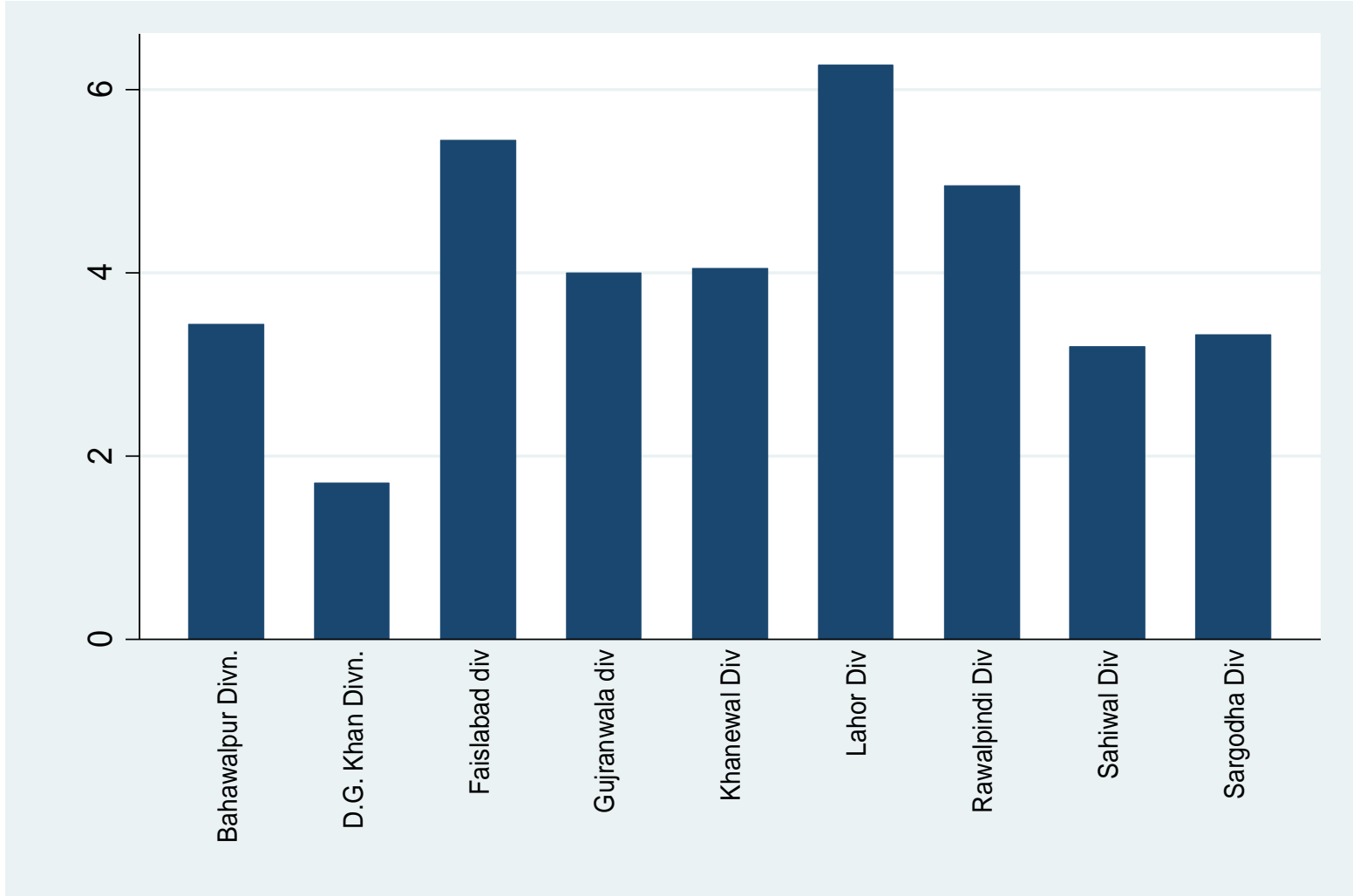
Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
TC	175	3.10512	1.110924	1.21949	8.471411
UT	175	4.061714	2.75649	.2	14.3
PS	175	.0074842	.0017841	.0032554	.0144049
Pop	175	1.58516	.2834145	1.09569	2.222765
Ed	175	56.85143	11.67819	27	80
EA	175	.0900348	.0689168	.0114329	.3248555

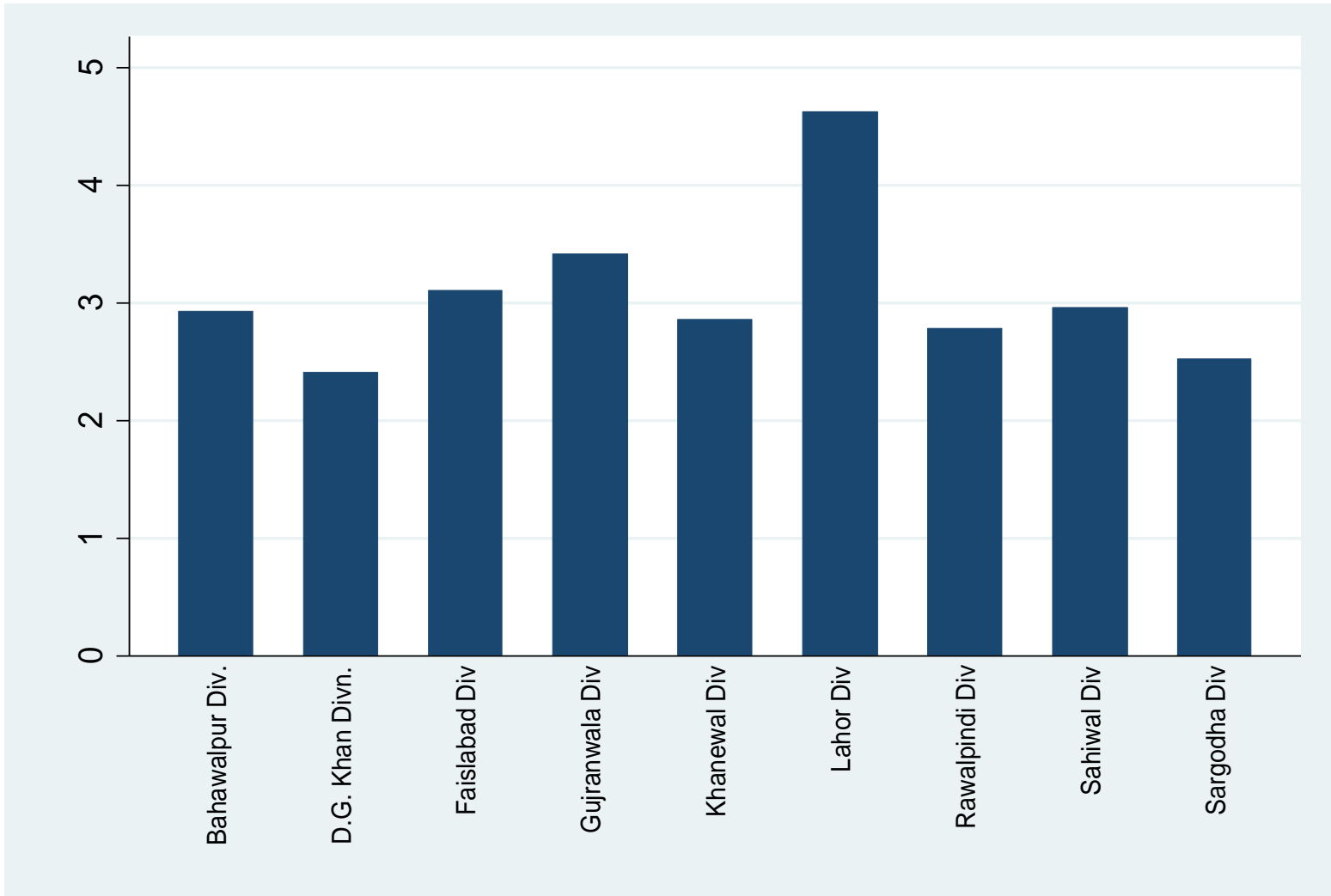
- On average there are 3.15 total registered crimes per thousand people in each district of Punjab with standard deviation of 1.11 and there are 4.06 cases per thousand people which are untraced in each district of Punjab having a standard deviation of 2.75

Graphical Analysis

Untraced cases



Total crime per thousand people



Empirical Results

	(1) TC	(2) TC	(3) Log TC	(4) Log TC	(5) TC(LSDV)	(6) TC (Less dens districts)	(7) TC(High dens districts)
Police Strength	181.2974*	238.474**	24.3806*	33.5525**	171.3231*	282.0303**	87.8152
	(78.6538)	(83.8437)	(11.8745)	(12.6451)	(77.8039)	(105.1671)	(62.5390)
Untraced crime	0.1004**	0.0955**	0.0127*	0.0119*	0.0831*	0.1630***	0.1536**
	(0.0365)	(0.0355)	(0.0055)	(0.0054)	(0.0349)	(0.0470)	(0.0488)
Population Growth	4.1014***	4.2040***	0.5972***	0.6137***	4.1782***	6.7975***	6.1807***
	(0.9811)	(0.9772)	(0.1481)	(0.1474)	(0.9805)	(1.6611)	(1.7198)
Education	-0.0437**	-0.0431**	-0.0068**	-0.0067**	-0.0476**	0.0124	-0.0176
	(0.0155)	(0.0153)	(0.0023)	(0.0023)	(0.0150)	(0.0251)	(0.0231)
Economic activity	-4.4749*		-0.7099**		-0.7495**	-7.5611**	-5.2988*
	(1.7771)		(0.2683)		(0.2862)	(2.4186)	(2.3367)
Police Strength* Economic Activity		-644.352**		-102.908**			
		(228.9125)		(34.5239)			
_cons	-2.2722	-2.8589	-0.2600	-0.3546	-3.2294		
	(1.8852)	(1.9124)	(0.2846)	(0.2884)	(2.0075)		
N	175	175	175	175	175	80	80
R2	0.863	0.864	0.794	0.797	0.863	0.882	0.871

Divisional Analysis/Slope Dummy with PS

	(1) TC	(2) TC	(3) TC	(4) TC	(5) TC	(6) TC
Police Strength	217.0439** (81.0307)	201.9303** (77.2613)	109.0303 (76.7764)	196.9998* (83.9050)	236.7010** (79.5647)	177.0199* (78.7766)
Clearance Rate	0.0797* (0.0346)	0.0872* (0.0342)	0.0918** (0.0336)	0.0852* (0.0350)	0.0922** (0.0342)	0.0817* (0.0351)
Pop growth	4.1102*** (0.9727)	4.2294*** (0.9618)	4.4098*** (0.9439)	4.2291*** (0.9837)	4.4618*** (0.9628)	4.0945*** (0.9962)
Education	-0.0455** (0.0149)	-0.0583*** (0.0153)	-0.0450** (0.0144)	-0.0472** (0.0150)	-0.0437** (0.0147)	-0.0478** (0.0150)
Economic activity	-0.7481** (0.2837)	-0.8317** (0.2826)	-0.7427** (0.2748)	-0.7557** (0.2866)	-0.7373** (0.2795)	-0.7459* (0.2871)
D.G. Khan Div.	-475.5793 (258.5017)					
Gujranwala Div.		-1261.11* (499.895)				
Lahore Div.			256.0451*** (72.6936)			
Rawalpindi Div.				-187.1993 (227.3149)		
Sahiwal Div.					-204.7709** (74.1441)	
Sargodha Div.						-253.0059 (485.4327)
_cons	-3.2732 (1.9655)	-1.3537 (2.0932)	-3.6052 (1.9058)	-3.4385 (1.9914)	-4.3794* (1.9742)	-2.9323 (2.1150)
N	175	175	175	175	175	175
R2	0.866	0.869	0.875	0.864	0.870	0.863

Conclusion

- Untraced cases has positive and significant impact on total crime rate as low untraced cases enhances the chances of getting caught and increase the cost of committing crime
- Police Strength has overall positive impact on Total crime
- Population growth has positive impact on the total crime since high density mitigates the probability of arrest.
- Results suggested that government allocates police personnel on the basis of economic activity as police strength has deterrence effect in those districts where economic activities are higher and vice versa

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- Coefficient of police strength variable has weak positive impact in high crime dense areas.
- Police strength have weak positive impact on total crime in Sahiwal and Rawalpindi divisions while deterrent effect occurs in those divisions (D.G Khan, Gujranwala and Sargodha Division) where untraced cases are low.