Probing Crimes, Ethnic Diversity, Institutional Quality and Economic Misery in Pakistan

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Abstract: Pakistan's economy has been vulnerable due to sharp rise in crime rate, terrorism along with coexisted inflation and unemployment, so called economic misery for the last many decades. Covering time series data from 1984 to 2014 and by using Autoregressive Distributed Lags (ARDL) techniques, study explores the above nexus. The findings reveals that economic misery, ethnic diversity has significant positive impact on crime rates and quality of institutions shows significant negative impact on crime rate, while GDP per capita has nothing to do with crime due to economic misery instead of distributional of income impact.

Keywords: Economic Misery, Ethnicity Diversity, Crime, Institutions **JEL Classification:**

1. Introduction

Crime is not less than a challenge now a days for developing countries like Pakistan as it has been aggravating for last many decades. Political instability, high crime rate, terrorism and religious extremism in various shapes with severity are present in Pakistan for the last many decades. Political instability, extremism and terrorism are under critical observation and being tackled now a days. But to address high crime rate is a serious and demanding issue that emerges not from economic problems only, but also due to consistently deterioration of institutional quality, poor implementation of rule of law and ethnic problems. Ethnic diversity can be considered as "groups of those people which are different in cast, color, culture, nature and religion." A strong relationship has been observed between ethnic diversity and crime (Ellis, Beaver, & Wright, 2009; Hooghe & de Vroome, 2016), in different geographical areas with diverse intensity. The degree of crime rates level and its different causes vary intensively in heterogeneous communities than those of similar communities, Ellis et al (2009). Whereas its intensity is less in homogenous communities because of strong social ties (Bellair, 1997).

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Crime rate may vary across nations with a severity in types of crime among nations. However, its causal relation between interaction and social contacts may vary among nations. Becker (1968) concluded that ethnic criminology is rooted from the ideology of socially excluded people and due to economic issues such as unemployment, low wages. Moreover, different integrated problems of immigrant are one of the many causes. Few social scientists are of the view that those compatible countries sharing their borders, support good economic policies to frame up society, because socially cohesive society favors quality of institutions endogenously, and thus lead to the development of country (Banerjee et al., 2005; Easterly, 2006b). Other group of scholars are not optimistic about any endogenous institutional change as above argued because developing countries lacks some preconditions for possible occurrence of good governance, and thus so vulnerable and have artificial borders which could easily be split from society into groups, finally create hindrance in implementation of development policies and good governance due to evolving problems from ethnic diversity. Politician often exploit ethnic groups to snatch resources away from other groups to their own group, thus emerge economic inequalities. Therefore, economic channels of crime are interlinked with social channels, however the degree of association may vary across countries, depending level of ethnic diversity, institutional quality and economic inequality, which ultimately instigate people to go for crime.

Pakistan is 6th most populous country in the world and carries large area which makes 36th position in the world with respect to area. Through the history, Pakistan has been facing multiple challenges such as economic and political instability, terrorism and extremism of religion type, moreover debt burden, poverty retarded economic growth badly or often remained volatile due to bad governess low saving and foreign direct investment. These factors added oil on fire.

Figure 1: Trends of Crime Growth Rate, Population Growth Rate and GDP Growth Rate of Pakistan

Source: Compiled by the authors, Data taken from World Development Indicator (WDI), PBS

One can observe volatility in crime rate significantly and in mid- 80 it was highest but after the year 2005 growth rate of crime dropped down until 2011. Corruption is the curse in society and leads to misuse of resources, forgery, fraud and creation of hidden economy which ultimately generates the problem of balance of payments and term of trade for Pakistan. Recent shape of circular debt is the consequence of corruption also.

Insecurity is a cause of low foreign investment in Pakistan and this factor led to shift of industries capital away from the country. Pakistan observes blend of feudalistic, landlords and capitalist system, where they do not accept anything against their interests ultimately significant number of people are deprived of basic economic needs and human rights.

Deteriorating law and orders situation, poor institutional quality, aggravated poverty are making crime situation so rigorous. Magnitude of ethnic based diversity is very significant as compared to other type of diversity in Pakistan.. These ethnic groups are involved in several types of crimes like ethnic based killing, robbery, dacoit, burglaries, theft, kidnapping for ransom etc. In Karachi, there is large number of socioeconomic issues generated from the conflict among different ethnic groups and thus rising crime rate in city. Almost 30% of the crimes remained unregistered. Determine the causes of crime is not simple and easy task where a large number of ethnic groups exist. It is obvious, that high crime rate is a hurdle in the way of a sustainability and development

of an economy. There is huge gap and unexplored literature regarding the nexus among ethnic diversity, institutional quality, economic growth and crime rate in case of Pakistan, and even globally short of studies available. Previous studies have focused on socio-economic determinants of crime by ignoring the role of ethnic diversity and economic misery altogether, particularly for the case of Pakistan. This study incorporates ethnic diversity by using the methodology of (Alesina, 2003) parallel with economic misery i.e. inflation and unemployment. This study is unique effort that highlights practical insights of the theory of economics of crime in relation with economic misery, ethnicity diversity and institutional quality by using Autoregressive Distributed Lags (ARDL) model. Present study takes into account annual data for the period of 1980 to 2014 in case of Pakistan.

This study follows the following sequence: first section covers introductory part of study, the second section highlights the previous studies, section third is insight of theoretical background of the study, data analysis and methodology, next sections provides discussion of results. Finally section five accomplishes with the policy suggestion in the light of results.

2. Literature Review

Economics of crime covered by Becker (1968) in the article entitled "Essays in the economics of crimes and punishment." Ehrlich (1973) drawn his attention on the Becker's study by including the variables of income levels and their distribution effects. Hooghe and de Vroome (2016) found on significant association between fear of crime and crime to occur, whereas the ethnic diversity behaves positively with fear of crime. The other dimension of crime i.e economic misery has been explored in the studies of (Saboor, Sadiq, Khan, and Hameed, 2016) that, according to the Okun's misery index, people are threefold miserable in democratic regime than that the regime of monocracy. Whereas the Barrow's misery index model verifies that people are twice worsening in quasi democratic periods. Enamorado, López-Calva, Rodríguez-Castelán, and Winkler (2016) concluded that income inequality responded positively and significantly effect on crime. Cohen, Ferretti, and

McIntosh (2014) pointed out misery index as a statistic measure for the level of a population's economic depression by decomposing the expectations-augmented Phillip's curve and Okun's law. Rehavi and Starr (2014) captured criminal aspect of deprivation and discrimination in the sentenced they were given. Their study found black guilty suffers 10 percent longer imprisonment than the white people under the same crimes. Other interesting fact is that fine imposed discrimination, was also higher on black arresters than the white arresters which is 1.75 times more.

Piraee and Barzegar (2011) examined the relationship between the misery index and the crime rate to determine the motivational and opportunity effects of the misery index in Iran. This study concluded a long-run relationship between property crimes and misery index and also found two-way causality among willful murder, bribery, forgery, indecent commitments, embezzlement, stealing and the misery index.

Tang and Lean (2009) used misery index for American economy for the period of 1960-2005 to see its effects on crime and found positive relationship between them. Moreover, decrease in the unemployment rate would indirectly increase the inflation rate (due to the trade-off Phillips curve effect) and may eventually increase the crime rate. Piquero and Brame (2008) found that black people commit more crime. The study also found no significance relationship in arrested rate on racial and ethnic basic and crime.

Otu and Horton (2005) showed a study on ethnic diversity and crime and finding exposed that reduction in ethnicity differential reduces crime rate. Sampson and Lauritsen (1997) found black were more inclined in criminal activities, burglary and murders than white people. Ralston (1999) observed that inflation and crime rates have positive association. Devine et al. (1988) recognized the cause of crime rate is an inflation because low income periods or hard times instigate and intensify criminal behavior and reduce the deterrence against crime.

Aurangzeb (2012) considered population, consumption expenditure, literacy and GDP have positive impact on crime rate. However, the electricity crisis and migrants impact fragile but positive on crime rate.

Qadri and Kadri (2011) are of the view that education and health contribute positively in increasing crime whereas misery i.e. inflation and unemployment pose insignificant relationship with crime. While Gillani, Rehman, and Gill (2009) found that unemployment, poverty and inflation had significant positive relationship with crime.

Though, globally there is literature on economic misery, ethnicity diversity, institution and crime, but this dimension has been neglected while linking with crime in case of Pakistan. So, present study caters this dimension by exploring linkages and their impact on crime.

3. Theoretical Framework, Data Sources and Methodology

3.1 **Theoretical Framework**

Economics of crime in linkage with ethnic diversity, economic misery and institution quality has been debatable. A new debate on the behavior of criminals for committing crimes was initiated by as Becker (1968) and Ehrlich (1973) who explored the reasons of crimes.

Becker's (1968) provides simple logical view, with the increase in input price, cost of economic activities increases, which impact positively on the level of offenses.

$$L = D(0) + C(P, 0) + bpf0....eq$$
 1

Whereas, "D" shows damages arising from crime, "C" is cost of conviction and apprehension "bpfo" cost in the form of social loss from punishments and "L" shows ultimately the loss "L", since "bf" is the loss per offense punished and "p0" is total number of punished offenses. An increase or decrease one's expected utility arising from offence, would reduce the number of offences. This can be expressed as expected utility function of a potential offender as mentioned below

$$EU_i = p_iU_i(Y_i - f_i) + (1 - p_i)U_i(Y_i)....eq$$
 2

Whereas, Y_i represents income from an offence, U_i represents utility

function, $\mathbf{f_i}$ represents his monetary equivalent of the punishment. Becker (1968), the relevant variables appears differently from person to person due to personal heterogeneity. Following aforementioned theory and study of Han (2009), which considers, property crimes, violence crime, kidnaping, murder etc. This study takes total crime by adding these categories and adds up some important socioeconomics variables for empirical analysis i.e. ethnic diversity. The functional form of the model is as under,

$$\begin{aligned} \text{Logcrm}_t = & \alpha_0 + \beta_1(\text{Emis})_t + \beta_2(\text{Eth})_t + \beta_3(\text{Ins})_t & \dots...4 \\ & + \beta_4(\text{Gdpp})_t + \beta_5(\text{Hc})_t \end{aligned}$$

Economic Misery captures economic rationale for crime to occur, while ethnic diversity is taken to cover social side. Many studies have provided the role of ethnic diversity to impact crime, when some people are socially excluded from society and they are deprived of basic rights in employment and other business of life. When resources are diverted to some groups of people at the cost of other groups of people, this also leads to crime. Therefore ethnic groups whether religious or linguistic, when ignored they incline towards crime. Role of institution is taken deterrence variable because weak institutions leads to more crimes. While household consumption is chosen because it shows society standard of living and demonstration effect that leads to crime because of positive association between them.

3.2 Data Source

Crime includes murder, attempted murder, kidnapping/abduction, child lifting, dacoit, robbery, burglary, cattle theft, other theft and others miscellaneous crime. The data for all reported cases of crimes published Pakistan Bureau of Statistics, 50-Years Book of Pakistan and Pakistan Statistical Year Books (various issues) taken by this study. The data for ethnicity diversity was taken from the Cline Center for Democracy Data Base. This study has adopted methodology of Alesina et al. (2003) for

ethnic diversity on linguistic basis by using the following formula.

$$FRACT_{j} = 1 - \sum_{i=1}^{N} S_{ij}^{2} \dots eq$$
 5

Whereas, \mathbf{S}_{ij} is the share of each group i, (i=1.....N) in the country j (means Pakistan) in all groups. The range of this index is between 0-1. Zero "0" shows complete homogenous country and "1" shows absolute heterogeneous country. Economic misery is the combination of inflation and unemployment i.e. (Economic misery = inflation rate + unemployment rate). Data of inflation and unemployment rate is taken from IMF and WDI. Data of institution is taken from International Country Risk Guide (ICRG) and through applying principal component analysis (PCA) this study generated index to create variable of institutional quality, whereas data for GDP per capita i.e. in log form and household consumption as a percentage of GDP extracted from the website of world development indicator (WDI). The data period for the present study is from 1984 to 2014.

3.3 Methodology

Basic condition of using time series is to check unit root problem first and in the absence of this problem OLS regression may be applied.

To encounter this problem of time trend in underlying variables is tested with analysis of unit root and then study uses ARDL to investigate long run relationship. ARDL bounds testing approach was first developed by Pesaran, Shin, and Smith (1999) and later extended by Pesaran, Shin, and Smith (2001). The ARDL bound testing approach can be applied without the restriction of order of integration of variables. ARDL bounds testing approach (Pesaran et al., 2001) also involves estimating the Unrestricted Error Correction Model (URECM) for determining short run relationship. ARDL error correction representation can be applied, if F-Statistics confirms long run relationship (Nkoro and Uko, 2016)

Whereas, α_0 is drift, ϵ_t is the error term, β_i are the short-run coefficients, Δ is the first difference operator and p and q are optimal lag lengths (which may vary from variable to variable) and Logcrm, Eth, Emis, Ins, Gdpp and Hc are Log of total reported crime cases, ethnicity diversity, economic misery, institution, GDP per capita and household consumption respectively. The F test is used for testing the existence of long-run relationship i.e. cointegration. The "Null Hypothesis" for no cointegration among variables in equation (6) is H_0 : $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ against the "Alternative Hypothesis" H_1 : $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$. The long run relationship among the variables can be expressed in equation form are as under:

The orders of the lags in the ARDL model are selected by following the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC), i.e 2, before study proceeds for long run relationship. The ARDL specification of the short-run dynamics can be derived by constructing an Error Correction Model (ECM) of the following form:

$$\begin{array}{lll} \Delta Logcrm_{t} = & \alpha_{0} + \sum_{t=1}^{1=p} \varphi_{i} \, \Delta \, (Logcrm)_{t-1} + \\ \sum_{t=0}^{i=q1} \omega_{i} \Delta \, (Eth)_{t-1} + & \sum_{t=0}^{i=q2} \gamma_{i} \Delta \, (Emis)_{t-1} + \sum_{t=0}^{i=q3} \delta_{i} \Delta \, (Ins)_{t-1} + \\ \sum_{t=0}^{i=q4} \varphi_{i} \Delta \, (Gdpp)_{t-1} + & \sum_{t=0}^{i=q5} \vartheta_{i} \Delta \, (Hc)_{t-1} + \psi ECM_{t-1} + \epsilon_{t}.....eq \\ 8 \end{array}$$

Where ECM_{t-1} is the error correction term, defined as

All coefficients of short-run equations show short run dynamics of the model, convergence to equilibrium and value of ECT represents the speed of adjustment.

4. Empirical Results

Table 1: Test for Unit Root

| | ADF | without | ADF | with | PP | without | PP with | trend |
|----------------------------|----------------------|-----------------------|------------------|-----------------------|------------------|-----------------------|-------------------|-----------------------|
| | trend | | trend | | trend | | 11 WILLI | ticità |
| Varia | Varia Test Statistic | | Test Statistic | | Test Statistic | | Test Statistic | |
| bles | At level | 1st differe nce | At level | 1st differe nce | At level | 1st differe nce | At level | 1st differe nce |
| Log of | - | - | _ | - | - | - | - | - |
| Crime | 0.91 08* | 5.593 8*** | 2.51 98* | 5.526 7*** | 0.93 45* | 5.655 0*** | 2.632 518* | 5.583 6*** |
| Ethnic ity Diver sity | - 2.56 04 | - 2.364 0** | - 0.55 75 | - 3.193 4** | - 0.82 06 | - 1.743 9** | - 0.806 347 | - 2.611 5** |
| Econo mic Miser y | - 2.57 88* | 7.553 0*** | - 3.26 64* | - 7.426 1*** | - 2.47 54* | 7.553 0*** | 3.265 266* | 7.426 1*** |
| Institu | - | - | - | - | - | - | - | - |
| tion | 1.73 | 4.718 | 1.84 | 4.639 | 1.94 | 4.740 | 2.118 | 4.665 |
| | 77 | 7*** | 74 | 4*** | 16 | 8*** | 869 | 0*** |
| LGDP | 0.78 | - | - | - | 0.76 | - | - | - |

| | 69 | 5.191 1*** | 1.23 34 | 1.233 4*** | 98 | 5.191 8*** | 1.233 466 | 5.711 6*** |
|----|------|---------------|------------|---------------|------|---------------|--------------|---------------|
| HC | - | - | - | - | - | - | - | - |
| | 1.76 | 6.983 | 1.78 | 7.633 | 1.71 | 6.874 | 1.659 | 7.633 |
| | 37 | 6*** | 15 | 3*** | 84 | 9*** | 500 | 3*** |

Source: Author's Calculation. *represents significant level of 0.10(10%), ** significance level of 0.05(5%) and *** as the significance level of 0.01(1%). ADF and PP represents the Augmented Dickey Fuller and Phillip Perron tests for stationary, with and without trend, at level and first difference.

Table 1 shows the robust results regarding the unit root of the variables. To know the stationarity of each variable, study followed both criteria i.e. Augmented Dickey Fuller (ADF) and Phillip Perron (PP) unit root methodology. Table 1 depicts that all the variables are stationary at level I(0) and first difference I(1). The null hypothesis of both the tests confirms that no unit root exists in the series. All the variables have mixed order of integration I(1) and I(0) and none of integrated at I(2), thus ARDL testing can be proceeded for further implementation of cointegration for knowing long run relationship among the variables.

Table 2: Result of Bound F-testing

| Tuble 2. Result of Bound 1 testing | | | | | | |
|------------------------------------|----------|-------|-------|-------|--------------|--|
| Critical Value | s Bounds | | | | F-Calculated | |
| Cianifiaanaa | Lower | Bound | Upper | Bound | | |
| Significance | I(0) | | I(1) | | | |
| 10% | 2.72 | | 3.77 | | 6754005 | |
| 5% | 3.23 | | 4.35 | | 6.754885 | |
| 2.5% | 3.69 | | 4.89 | | | |
| 1% | 4.29 | | 5.61 | | | |

Source: Author's own calculations

Table 2 shows the result of bound testing approach to observe whether cointegration exist by considering Bound test of Pesaran et al. (2001). According to critical value of Pesaran, the upper bound value is 5.61, 4.89, 4.35 and 3.77 at 1%, 2.5%, 5% and 10% level of significance respectively. Whereas the values of F-statistics is 6.754, which is higher than the critical upper bound value at 1%, 2.5%, 5% and 10% level of significance using restricted intercept and no trend. The value of F-statistics indicates overall significant of the model by establishing

cointegration and long run relationship among the variables.

Table 3: Estimate Long Run Coefficients by using ARDL Approach
With Lag length (1.1.1.2.1.2)

| With Eag length (1,1,1,2,1,2) | | | | |
|-------------------------------|----------------------|--|--|--|
| Variable | Total Crime Equation | | | |
| ETH | 3.930224*** | | | |
| | 0.361703 | | | |
| EMIS | 0.013181*** | | | |
| | 0.002316 | | | |
| INS | -0.019142*** | | | |
| | 0.004313 | | | |
| HC | 0.005758* | | | |
| | 0.002866 | | | |
| LGDP | 0.106655 | | | |
| | 0.084904 | | | |
| C | 1.666859*** | | | |
| | 0.274627 | | | |
| \mathbb{R}^2 | 0.992607 | | | |
| Adjusted R ² | 0.982751 | | | |

Notes: Each column presents the results from separate regression. The standard errors in parentheses.***Shows the 1%

significance of coefficients, ** Shows the 5% significance of coefficients, * Shows the 10% significance of coefficient.

Table 3 reveals that ethnicity diversity as most important driver impacts the crime rates positively with the coefficient of 3.9 means 1 % increase in ethnic diversity will increase crime by 3.9 %, when people are socially excluded. The study shows similar results as past literature found positive and significant relationship between ethnicity diversity and crime, see: (Martinez Jr, Martinez, & Valenzuela Jr, 2006; Patacchini & Zenou, 2012; Sampson & Lauritsen, 1997). Economic Misery has direct positive relationship with crime rate, and 1% increase in economic misery, increases crime rate by .013 %. These results are also similar to the study of Cohen et al. (2014); Piraee and Barzegar (2011); Tang and Lean (2009). Whereas, Institution has negative significant relationship with crime rate that decreases crime rate by .019 % with the 1 % increase in institutional performance. Household consumption has positive and significant relationship with crime rate i.e. 1 % increase in household

consumption increases crime by 0.005 %. which supports the result of previous literature see studies of (Aurangzeb, 2012; Hicks & Hicks, 2014). This study also explores positive relationship between crime rate and household consumption. GDP per capita provides insignificant but positive relationship with crime rate. There has been a unique but not surprising relationship between GDP per capita and crime rate. As GDP per capita increases the capacity of individual for committing crime also increases see the studies of (Fajnzylber, Lederman, & Loayza, 2002; Klaer & Northrup, 2014). Some study found reverse results that as GDP per capita decreases the crime rate increases (Ahmad, Ali, & Ahmad, 2014).

Table 4 Error Correction Representation for the Selected ARDL Model

| Variable | Total Crime |
|-------------|----------------|
| | Equation |
| ETH | (43.198156) |
| | 26.635603 |
| EMIS | (0.002353) |
| | 0.002045 |
| INS | -(0.003403) |
| | 0.005387 |
| HC | (0.008287) |
| | 0.004794 |
| LGDP | (0.153502) |
| | 0.119166 |
| CointEq(-1) | (-1.439235)*** |
| | 0.294732 |

⁽⁾ represents coefficent ***Shows the 1%, 5% and 10% significance level

The ECT (Error Correction Term) value indicates that model converges in short run to long run equilibrium with a change of ethnicity diversity, economic misery, institution, GDP per capita and household consumption.

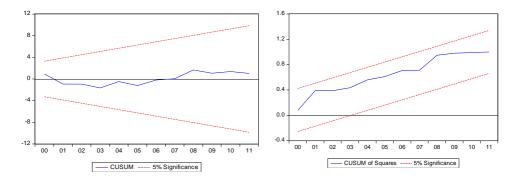
Table 5 Diagnostic Tests of Total Crime Equation

| | Crime Equation | 1 |
|--------------------|----------------|------------------|
| Test Statistics | LM Version | F Version |
| Serial Correlation | 2.217316 | F(2,12) 0.1515* |
| Normality | 0.092331 | Not applicable* |
| Heteroscedasticity | 0.490530 | F(25,14) 0.9417* |

^{*}shows 95% confidence interval.

Table 5 represents the various diagnostic tests to check the validity of ARDL model. The result indicates that there is no problem of serial correlation and heterosecedasticity in the model. Whereas the value of LM version and F-version are more than 0.05, which show null hypothesis (existence of Serial correlation) is rejected against the alternative hypothesis of non-existence of serial correlation. The results of heterosecedasticity also indicate that error term is normally distributed, and there is no problem of heterosecedasticity.

Figure 2 Diagnostic Graphs for Stability (CUSUM & CUSUMQ)



The straight lines represent critical bounds at 5% significance, whereas the residual line within the critical bounds shows the Cumulative Sum of Recursive Residuals and Cumulative Sum of Squares of Recursive Residuals regarding stability of the ARDL model.

5. Conclusion & Policy Implication

This study used ARDL approach to show long run relationship between crime rate, economic misery, ethnic diversity and institutions. The estimated results of the study reveal the significant and positive relationship of ethnic diversity with crime rate in long run. It means that widened diversity of ethnicity is a cause of crime in long run (Patacchini & Zenou, 2012; Sampson & Lauritsen, 1997). Economic misery also shows positive relationship with crime because economic misery decreases income and brings down the costs of committing crime for unemployed people which ultimately motivate individuals to commit crime (Cameron, 2014; Gillani et al., 2009; Khan, Ahmed, Nawaz, & Zaman, 2015). Most of the literature (Abdul Hamid, Habibullah, & Mohd Noor, 2012; Gillani et al., 2009; Khan et al., 2015) shows that there is positive relationship between unemployment and crime in Pakistan and in rest of the world. Institutional quality has negative impact on crime rate because strong institutions are profound hindrance in the way of crime occurrence. When a criminal perceives that he cannot be rid of after crime, he avoids the criminal acts. This study suggests that diversity cannot be condensed; however, its severe effects can be lessened by social inclusion and providing equal opportunity to all the individuals of the society and establishing a cohesive society. Further, it is need of time to ensure rule of law and order without discriminations of ethnic groups and have to formulate stagflation counter policies in the country, because inflation and unemployment increase economic misery.

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