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# **Conflict, Growth and Human Development An Empirical Analysis of Pakistan**

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## *Abstract:*

*This paper uses the Autoregressive Distributed Lag (ARDL) Bound Testing cointegration approach to study Pakistan's long-term relationship between internal conflict, economic growth, and human development. We show that, by offering better opportunities and reducing radicalization, education could help reduce conflict in Pakistan. However, the government's spending on its defense budget is high and results in low social spending. We also show a positive contribution to conflict reduction by public order, which justifies the anti-terrorist policy. It also seems that economic reforms and wealth do not help to reduce internal conflicts in Pakistan. This result could illustrate a situation where globalization is perceived as a threat, and economic growth finance political and social unrest. Political rights and civil liberties do not seem to reduce conflict either; periods of democracy have experienced a resurgence of violence. Pakistan could be caught in a development trap with conflict being a key variable to consider before seeing the benefits of reforming the country.*

Keywords: Conflict, Economic Growth, Human Development, Pakistan.

JEL classification: C22, D74, O10.

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## 1- Introduction

In the first decades after independence, Pakistan's economy grew rapidly, and had good economic prospects (World Bank, 2002). However, due to complex geopolitical and socio-economic conditions, Pakistan has been confronted with several distinct but interrelated conflict situations.

The history of conflict in Pakistan is as old as the country's existence. The legacy of the partition of India and the two wars in 1947 and 1965 is seen in unresolved conflict situations, such as in Kashmir, but also in the Pashtun and Baluchi territories. Other regional developments, such as the 1971 secession of Bangladesh from Pakistan, the wars in Afghanistan in 1979-89 and 1996-2001, and the US-led war on terror after 2001, have also affected the political, economic, and social situation of the country (Waseem, 2011).

Pakistan's internal situation has increasingly suffered from sectarian and ethnic violence between its diverse populations (Ahmar, 2007). The increase in sectarian division was observed in the late 1970s and early 1980s, due to internal political changes and fears that the Islamic revolution in Iran would lead to Shiite control of the country (Abbas, 2010). The military regime that came to power in 1977 pursued a policy of Islamization that resulted in a separation between Sunnis and Shiites on the one hand and between different Sunni groups on the other hand. Tensions between Sunnis and Shiites further worsened because of Pakistan's support for Iraq in its war against Iran. The relationship continued to deteriorate with Pakistan's support for Taliban in Afghanistan in the 1990s, and despite the withdrawal of support for the Taliban in 2001 after joining the North Atlantic Treaty Organization's (*NATO*) intervention in the country. More recently, the growing conflict in the Middle East has fueled sectarian groups on both sides, and intensified violence in the country. As a result, violence between different religious groups has increased since 2012, with perpetrators including the Taliban and the Islamic State affiliated groups in Iraq and Sham (ISIS) (Rafiq, 2014).

Due to religious differences, nearly 1,000,000 people were killed after the division of the subcontinent in 1947. In the civil war between Pakistan and Bangladesh, about 500,000 more people died. More recently, lives have been lost due to sectarian conflict between Sunnis and Shiites. At the same time, the Pakistani Taliban insurgency created new problems after the 2001 war with Afghanistan. Since then, terrorism and the war against terrorism have been increasingly costly for Pakistan, both in terms of casualties and economic costs, with the number of conflict-based incidents increasing from 109 in 2000 to 1,177 in 2016.<sup>1</sup> In total, more than 50,000 people died of terrorism during this period and the economic cost is estimated at about US\$ 120 billion<sup>2</sup>.

In recent times, many countries have faced violent conflict and many researchers have tried to understand what triggers these conflicts (World Bank, 2011). Collier (2007) states: "Seventy-three percent of people of the bottom billion have recently been through a civil war or are still in one". Stewart (2002) notes that most economies in the bottom percentile of human development have been

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<sup>1</sup> See Global Terrorism Database (GTD, 2016) for Pakistan

<sup>2</sup> <https://www.peaceinsight.org/conflicts/pakistan/>

confronted with civil wars over the last three decades. The author further states that countries with low GNP per capita are more likely to experience conflict. Ostby (2008) confirms that poverty, inequalities and dependence on natural resources account for much of the world's conflicts. Caruso and Schneider (2011) add that a lack of economic opportunities can lead to distress, hatred, and grievances in certain sections of the population that result in violence. Collier and Hoeffler (2004) state that bad government policies, by increasing greed and/or grievance among the population, can result in conflicts. They show that a higher level of GDP per capita and education, as well as other factors of human development, lead to fewer conflicts<sup>3</sup>. The authors also define 4 common sources of grievance: (i) Religious and ethnic hatred (ii) Economic inequality (iii) Political exclusion (iv) Political repression.

Another explanation of the causes of conflict lies in Caruso and Schneider's (2011) theory of "immiserizing modernization". Olson (1963) developed the theoretical foundation of this argument. Economic growth can change the distribution of wealth in a country, with some groups losing out. This can lead to grievances which can be used by terrorist organizations. This implies that conflicts can arise even in the presence of economic growth. In addition, even though the increase in income affects the entire population without increasing inequalities, unchanged relative poverty can still fuel grievances.

Bernholz (2004) describes the ideological content of certain conflicts through the concept of "supreme values". These values refer to one or more objectives that are preferred to all others, and whose realization comes before any other value (Wilkins, 2011). If the grievance concerns problems other than poverty, such as injustice or unequal treatment of certain regions, ethnic groups, religions or population groups - as in Pakistan (Abbas, 2010; Ahmar, 2007; Rafiq, 2014) - the increase of wealth can raise the resources of the terrorist organizations, and therefore their conflict-based activities.

In Pakistan, the conflicts have caused enormous damage to the economy. Problems such as unemployment, poverty, inequality, corruption, uncertainty, illiteracy, poor health and living conditions, internal displacement, extremism, and radicalism are related to the situation of conflict in the country (Easterly, 2001; Ali, 2010). In monetary terms, the government spends much of its budget on defense and other dispute resolution mechanisms, leaving little room for development spending (Gupta et al, 2004). As a result, infrastructure is severely degraded and social spending, especially on education and health, is very low (Akram and Khan, 2007; Benz, 2012)<sup>4</sup>. During the Soviet-Afghan War, and after September 2001, the international community (especially the United States) provided considerable financial assistance. This aid provided short-term help to manage the budget deficit. However, it did not offer a real solution to the problems of the economy.<sup>5</sup>

This study explores the link between internal conflict, economic growth, and human development in Pakistan over the period 1978 - 2016. In addition to the direct costs of conflict

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<sup>3</sup> On all these issues, see also Stewart (2002), Berrebi (2007) and Vincent (2009). On Pakistan more specifically, see Malik (2009) and (2011). On Nepal, see Murshed and Gates (2005).

<sup>4</sup> See also "Public Financing of Education in Pakistan and Agenda for Education Budget 2016-17", Institute of Social and Policy Sciences (I-SAPS), Islamabad, for expenses in education.

<sup>5</sup><https://tribune.com.pk/story/135156/myth-vs-reality-us-aid-to-pakistan-dwarfed-by-economic-cost-of-war-business/>

on growth, we consider the opportunity costs. Because of its involvement in conflict resolution, the government of Pakistan does not have much room to invest in social issues. Although police and defense spending is designed to combat violence, investments in human development may lower the risk of conflict by reducing grievances among populations. Educated people are also less likely to fight because they can use their own reasoning to form their own opinions. They can also use their knowledge to improve their economic and social condition (Berrebi, 2007). In the empirical part of this study, we show that education could help to reduce long-term conflicts in Pakistan. We find that defense spending also contribute to this.

These findings are important in the context of the limited resources of the Pakistan government. It is also the first time to our knowledge that these costs have been validated by data for Pakistan. Another contribution of our research is to expand the explanatory factors of internal conflicts. The roles of wealth and economic reform, in particular, have not yet been examined for Pakistan. The same applies to political freedom and civil liberties. Our research in these areas gives new perspectives for the country. Finally, the question of the long-term cost of conflict in terms of development and growth is another issue that has not been studied before for this country.

The article is organized as follows: in Section 2, based on the literature, we introduce our model of internal conflicts, human development, and growth. We also define the variables used in the analysis and the sources of data. Section 3 highlights the methodological aspects related to short- and long-term dynamic estimates. Section 4 presents the results of the empirical analysis. The last section concludes with our main findings and policy recommendations.

## **2- Presentation of the Model and of the Variables**

### **2.1- The Model**

The equations used to investigate the relationship between internal conflict, economic growth, and human development are as follows:

$$Conf_t = \alpha + \alpha_1 GDPc_t + \alpha_2 Edu_t + \alpha_3 Open_t + \alpha_4 Military_t + \alpha_5 PolFree_t + \mathcal{E}_t \quad \text{Eq (1)}$$

$$GDPc_t = \beta + \beta_1 Conf_t + \beta_2 Edu_t + \beta_3 Open_t + \beta_4 Military_t + \beta_5 PolFree_t + \mathcal{E}_t \quad \text{Eq (2)}$$

where *Conf* is the proxy for internal conflict, *GDPc* the logarithm of GDP per capita, *Edu* the primary gross enrollment ratio, *Open* the trade openness indicator, *Military* the military expenditure as a percentage of GDP, and *PolFree* the political freedom variable.  $\mathcal{E}$  is the error term,  $t$  the time dimension,  $\alpha, \alpha_1$  to  $\alpha_5$  and  $\beta, \beta_1$  to  $\beta_5$  the parameters to be estimated.

### **2.2- The Variables**

#### ***2.2.1-Annual Conflict-Based Incidents as Proxy for Internal Conflict***

In previous studies, different conflict variables have been used, e.g. likelihood of a civil war, frequency of conflict, conflict-related deaths and injuries, damage to physical capital, property and infrastructure, cost of doing business. This study uses the log of the number of conflict-based incidents per year from the Global Terrorism Database (GTD, 2016) designated by *Conf* (see descriptive statistics in Table 7 in the Appendix). The GTD codebook defines an

incident as “*the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation*”<sup>6</sup>. Findley and Young (2011) also use this variable as an indicator of terrorism.

### **2.2.2- GDP per Capita as Proxy for Revenues and Wealth**

GDP per capita is our measure of economic wealth. Data are from the State Bank of Pakistan (SBP, 2016). The study uses the log of the variable in real terms, denoted *GDP<sub>c</sub>* (see descriptive statistics in Table 7 of the Appendix).

Empirical evidence on the impact of wealth on internal conflict is mixed. Humphreys (2003) indicates that low resources increase the probability of civil wars. Collier and Hoeffler (2004) also show that the impact of low resources may be to increase conflict. Caruso and Schneider (2011), however, find a positive relationship between increase in income and the number of people killed in conflict-based incidents. Freytag et al (2010) and Shahbaz (2012) confirm that GDP per capita is positively related to the increase in conflict. In the case of Pakistan, where conflicts are mainly based on the concept of "supreme values", a positive impact on internal conflicts can also be found.

### **2.2.3- Primary Enrolment Ratio as Proxy for Human Capital**

Freytag et al (2010) use the average number of years of schooling of the population over 15 as an indicator of human capital. Collier and Hoeffler (2004) select the gross secondary schooling rate as an explanatory variable for their conflict variable. Because long-term education data are not available for Pakistan, in this study we calculate the gross primary enrollment rate from the Pakistan Economic Survey data (PES, 2016)<sup>7</sup>. The variable is designated *Edu* (see Table 7 in the Appendix).

A negative coefficient of *Edu* in the conflict equation would mean that the more the government educates people, the less conflict there will be. Human capital is also an essential explanatory variable for economic development. Ramirez (1998) and Barro (2001) reveal the positive impact of education on growth. The impact of education should be negative on conflict and positive on growth.

### **2.2.4- Military Expenditures as Proxy for Law and Order**

This study examines the impact of military spending, a non-development expense, on the dynamics of internal conflict and growth in Pakistan. Collier and Hoeffler (2006) argue that, according to the "signaling model", a surge in military spending in post-conflict situations increases the chances of further conflict, because high military expenditure signals to the rebels that government is not seriously interested in peace. Feridun and Shahbaz (2010) and Asongu and Amankwah-Amoah (2016) believe, however, that increased military spending reduces conflict-based activities, thus confirming the effectiveness of military spending. Knight et al (1996) show a negative impact of military expenditure on economic growth.

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<sup>6</sup> Global Terrorism Database (GDT, 2017) Codebook: Inclusion Criteria and Variables.

<sup>7</sup> <http://uis.unesco.org/country/PK>

<sup>8</sup> Various editions of the Pakistan Economic Survey

Gupta et al (2004) point out that this negative relationship is due to low spending on development.

Increased military spending is therefore expected to reduce conflict, and long-term growth due to the crowding out effect on development spending. A negative sign for both variables is thus expected. The study uses WDI (2016) data in real terms and as a percentage of GDP. The variable is designated as *Military* (see Table 7 of the Appendix).

### **2.2.5- Trade Openness as proxy for Economic Reforms**

We use trade openness as an indicator of economic reform and integration into the global economy. Trade openness is considered as a factor of growth. Empirical evidence confirms the positive impact of trade openness on various indicators of economic activity (Sachs et al, 1995; Frankel and Romer, 1999; Dollar and Kraay, 2003). Trade openness can also be a factor in modernizing the economy. In both cases, it might be thought that the new opportunities created by trade openness discourage internal conflict (Blomberg and Hess, 2008). Freytag et al (2010), however, find a positive impact which shows that globalization can increase conflict if perceived as a threat. Wintrobe (2006) confirms the positive relationship between economic integration and terrorism. This scenario is similar to that developed by Caruso and Schneider (2011) in their theory of “immiserizing modernization”. If some groups lose out because of the reforms, new grievances may arise.

Trade openness should therefore increase growth, but its impact on conflict is uncertain. Our study attempts to verify its effect for Pakistan. We use the ratio of exports plus imports to GDP (in real terms), designated *Open*. Data are from WDI (2016) (see Table 7 of the Appendix).

### **2.2.6- Political Freedom as Proxy for Democracy**

We use the variable Political Freedom, from Freedom House (2016), as an indicator of democracy to explain both growth and internal conflict in Pakistan (see Table 7 in the Appendix). Li and Schaub (2004) argue that in democratic countries, because of political rights and civil liberties, it is easy for terrorists to engage in conflict-based activities. Eubank and Winberg (1998) confirm that terrorism occurs more often in democracies than in more authoritarian regimes. In the case of Pakistan, internal conflicts have been much more frequent during democratic periods than periods of military rule<sup>9</sup>. Eyerman (1998), however, finds a positive relationship between democracy and the absence of violence.

With regard to economic activity, Acemoglu et al (2014) find higher growth in democratic countries than in less democratic ones. They use a combination of various indicators such as political freedom and polity IV, as a proxy for democracy.

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<sup>9</sup> Data from Global Terrorism Database. (GDT, 2017) state that during two military rules (1978-1988 and 2000-2008), 107 conflict-based incidents in average occurred per year. However, during democratic rule (1989-1999 and 2009-2016) this number was 639 on average.

The variable Political Freedom is a combination of political rights and civil liberty, designated *PolFree*<sup>10</sup>. A high value indicates a low freedom and vice versa. *PolFree* should therefore have a negative relationship with the conflict variable and the growth variable for Pakistan.

### 3- Estimation of the Model: Methodological Aspects

#### 3.1- The Autoregressive Distributed Lag (ARDL) Bound Testing Approach

This study uses the Autoregressive Distributed Lag (ARDL) Bound Testing cointegration technique developed by Pesaran et al (2001) to investigate the long- and short-term dynamics between internal conflict, growth, and human development in Pakistan. The ARDL methodology can be applied regardless of whether the variables are stationary at level I(0), at first difference I(1), or a combination of both. This approach is effective for small samples<sup>11</sup>. It also allows the capture of short-term adjustments without losing the long-term information.

Before testing the existence of a long-term relationship, it is necessary to determine the order of integration of the variables. Although the ARDL method can be applied even if the variables are not integrated in the same order, the computed F-statistics are not valid in the presence of I(2) variables (Ouattara, 2004). We use both Augmented Dickey–Fuller (ADF) and Phillip-Perron (PP) tests to check the stationary assumption of the data. For both approaches, the null hypothesis states that the series is non-stationary, that is to say the data have a unit root.

##### 3.1.1-The Short-Run Dynamics

The ARDL representation of Equations (1) and (2) is as follows:

$$\begin{aligned} \Delta Conf_t = & \alpha + \sum_{i=1}^{p_0} \alpha_0 \Delta Conf_{t-i} + \sum_{i=0}^{p_1} \alpha_1 \Delta Gdpc_{t-i} + \sum_{i=0}^{p_2} \alpha_2 \Delta Edu_{t-i} + \\ & \sum_{i=0}^{p_3} \alpha_3 \Delta Open_{t-i} + \sum_{i=0}^{p_4} \alpha_4 \Delta Military_{t-i} + \sum_{i=0}^{p_5} \alpha_5 \Delta PolFree_{t-i} + \gamma_1 Gdpc_{t-1} + \\ & \gamma_2 Edu_{t-1} + \gamma_3 Open_{t-1} + \gamma_4 Military_{t-1} + \gamma_5 PolFree_{t-1} + \varepsilon_t \end{aligned}$$

Eq (1a)

$$\begin{aligned} \Delta Gdpc_t = & \beta + \sum_{i=1}^{p_0} \beta_0 \Delta Gdpc_{t-i} + \sum_{i=0}^{p_1} \beta_1 \Delta Conf_{t-i} + \sum_{i=0}^{p_2} \beta_2 \Delta Edu_{t-i} + \\ & \sum_{i=0}^{p_3} \beta_3 \Delta Open_{t-i} + \sum_{i=0}^{p_4} \beta_4 \Delta Military_{t-i} + \sum_{i=0}^{p_5} \beta_5 \Delta PolFree_{t-i} + \delta_1 Conf_{t-i} + \\ & \delta_2 Edu_{t-1} + \delta_3 Open_{t-1} + \delta_4 Military_{t-1} + \delta_5 PolFree_{t-1} + \epsilon_t \end{aligned}$$

Eq (2a)

where  $\Delta$  is the first difference operator,  $pi$ , the number of lags,  $t$ , the time dimension, and  $\varepsilon_t$ , the error term. *Conf*, *Gdpc*, *Edu*, *Open*, *Military* and *PolFree* are as defined in section 2.2. The  $\alpha_i$  and  $\beta_i$  explain the short-run dynamics and the  $\delta_i$  and  $\gamma_i$  describe the long-run relationship.

##### 3.1.2-The Long-Term Relationship

<sup>10</sup> The variable ranges from 1 to 7, with 1 for the highest degree of freedom and 7 for the lowest degree. We constructed the variable by adding the indices of political rights and civil liberty and dividing by 2. Online data is available at <https://freedomhouse.org/report-types/freedom-world>

<sup>11</sup> The Johansen and Juselius (1990) approach for cointegration analysis requires that the variables must be cointegrated in the same order, and that there must be a big sample.



To check the presence of a long-term relationship, we use the bound testing procedure based on the Wald-test (F-statistic) of the hypothesis of no cointegration (H0), against the hypothesis of cointegration (H1) between the variables, denoted as:

H0:  $\gamma_i = 0$  there is no cointegration (no long-term relationship) between the variables

H1:  $\gamma_i \neq 0$  the variables are cointegrated

Two critical values are given by Pesaran et al (2001) for this test. Cointegration between the variables exists if the value of the calculated F-statistics is higher than the upper bound value of the test. In that case, H0 can be rejected. If the F-statistics value is lower than the lower bound value, H0 cannot be rejected. In that case there is no long-term relationship between the variables. However, if the value lies between the upper and the lower bound value, the result is inconclusive and the presence of a long-term relationship is decided by the value of the error correction term.

### 3.1.3- Error Correction

When the long-term relationship is validated by the data, an error correction version of the model can be applied. The error correction model (ECM) can be written as follows:

$$\Delta Conf_t = \alpha + \sum_{i=1}^{p_0} \alpha_0 \Delta Conf_{t-i} + \sum_{i=0}^{p_1} \alpha_1 \Delta Gdpc_{t-i} + \sum_{i=0}^{p_2} \alpha_2 \Delta Edu_{t-i} + \sum_{i=0}^{p_3} \alpha_3 \Delta Open_{t-i} + \sum_{i=0}^{p_4} \alpha_4 \Delta Military_{t-i} + \sum_{i=0}^{p_5} \alpha_5 \Delta PolFree_{t-i} + p_1 ECT_{t-1} + \epsilon_t$$

Eq (1b)

$$\Delta Gdpc_t = \beta + \sum_{i=1}^{p_0} \beta_0 \Delta Gdpc_{t-i} + \sum_{i=0}^{p_1} \beta_1 \Delta Conf_{t-i} + \sum_{i=0}^{p_2} \beta_2 \Delta Edu_{t-i} + \sum_{i=0}^{p_3} \beta_3 \Delta Open_{t-i} + \sum_{i=0}^{p_4} \beta_4 \Delta Military_{t-i} + \sum_{i=0}^{p_5} \beta_5 \Delta PolFree_{t-i} + p_2 ECT_{t-1} + \epsilon_t$$

Eq (2b)

where the variables and parameters to be estimated are as defined in previous sections,  $ECT_{t-1}$ , the error correction term, is the residual of the estimated cointegration model (Eq 1 and Eq2), and  $p_{1,2}$ , the coefficients of  $ECT$ , the speed of adjustment back to the long-term equilibrium after a short-term shock. These coefficients should be negative and significant for the model to converge in the long term. This is the case in particular when the bound test concludes to cointegration and the presence of a long-term relationship.

### 3.1.4-The Relation between Growth and Conflict

The direction of the relation between conflict and GDP per capita can be tested through the error correction terms of the ARDL version of the *Conflict* and *GDPc* equations (Eq 1b and Eq 2b). If this term is not significant or positive, then there is no long-term relationship between the two variables: conflict does not explain growth and/or growth does not explain conflict in the long run.

## 3.2- Diagnostic Tests

Several diagnostic and stability tests can be performed to ensure proper fit of the model. Pesaran and Pesaran (1997) recommend using Cumulative sum (CUSUM) and Cumulative sum of squares (CUSUMSQ) to test the stability of the long- and short-term coefficients.

These tests require that the statistical result falls between the significance level of 5% critical bounds.

We also use several diagnostic tests: the Breusch-Godfrey and the Breusch-Pagan-Godfrey tests to examine respectively the serial correlation and the heteroskedasticity associated with the estimated model.

In order to select the optimal lag length for each variable, the ARDL approach estimates  $(p + 1)k$  number of regressions, where  $p$  is the maximum number of lags and  $k$  is the number of variables in the model. The number of lags is selected on the basis of the Akaike Information Criteria (AIC). The time period for analysis is 1978 to 2016.

#### 4- The Results of the Estimations

##### 4.1- Testing for Unit Roots

This study uses the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, as suggested by Enders (1995), to check the stationarity of the variables<sup>12</sup>. For both tests, all variables are non-stationary at level, but stationary at first difference level, except *Open* which is stationary at level (see Tables 1 and 2). As none of the variables is integrated at order 2 or above, we can use the ARDL Bound Testing procedure for long-term prediction.

**Table 1: ADF Unit Root Tests**

Variable	Level		First Difference	
	t-Statistic	Prob.	t-Statistic	Prob.
<b>Conf</b>	-1.56	0.49	-6.68	0.00
<b>GDPc</b>	-0.61	0.86	-6.58	0.00
<b>Edu</b>	-0.29	0.92	-6.21	0.00
<b>Open</b>	-2.69	0.09	-7.30	0.00
<b>Military</b>	-0.36	0.91	4.71	0.00
<b>FreePol</b>	-2.37	0.16	-6.18	0.00

**Table 2: PP Unit Root Tests**

Variable	Level		First Difference:	
	t-Statistic	Prob.	t-Statistic	Prob.
<b>Conf</b>	-1.31	0.61	-15.0	0.00
<b>GDPc</b>	-0.64	0.85	-7.54	0.00
<b>Edu</b>	-0.10	0.96	-6.54	0.00
<b>Open</b>	-2.71	0.08	-7.30	0.00
<b>Military</b>	-0.58	0.86	4.71	0.00
<b>FreePol</b>	-2.59	0.10	-6.19	0.00

##### 4.2- The ARDL Bound Test Estimations of the Equation of Conflict

Table 3 presents the results of the bound testing procedure when conflict is the dependent variable. It shows that the F-statistics calculated value is higher than the upper bound value at

<sup>12</sup> The optimal lags ( $k$ ) for conducting the ADF test were determined by AIC (Akaike Information Criteria).

the 1% significance level. Therefore, we can reject the null hypothesis of no cointegration and infer that there is a long-term relationship between the variables.

**Table 3: Bound Testing Results**

Null Hypothesis: No long-term relationships				
Test Statistic	Value			
F-statistic	6.19			
Critical Value Bounds				
Critical values	1 %	2.5 %	5 %	10 %
Lower bounds I(0)	3.06	2.7	2.39	2.08
Upper bounds I(1)	4.15	3.73	3.38	3

#### 4.2.1-The Short-Run Dynamics of the Equation of Conflict

Table 4 presents the results of the estimation of the short-term dynamics of the ARDL model where *Conflict* is the explained variable (Eq 1b). The coefficient of the error–correction term (*ECT*) is negative and statistically significant at the 1% level. This suggests that the error–correction model (*ECM*) is valid and that the model returns to equilibrium in the long term after a short-term shock. The value of the error–correction term is less than -1, which means that the model converges in less than a year (Narayan and Smyth, 2006).

**Table 4: Error Correction Model (*ECM*) Estimates**

Dependent Variable: *Conf*

Regressors	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta$ (Military)	0.49	0.53	0.92	0.37
$\Delta$ (Military (-1))	2.12***	0.63	3.35	0.00
$\Delta$ (Military (-2))	-1.08**	0.42	-2.61	0.02
$\Delta$ (Open)	0.08	0.05	1.6	0.13
$\Delta$ (Open (-1))	-0.19***	0.05	-3.81	0.00
$\Delta$ (Open (-2))	-0.11**	0.05	-2.35	0.03
$\Delta$ (GDPc)	13.15***	3.06	4.3	0.00
$\Delta$ (GDPc (-1))	9.82**	3.28	2.99	0.01
$\Delta$ (Edu)	-10.19**	3.66	-2.79	0.01
$\Delta$ (Edu (-1))	16.01***	3.57	4.49	0.00
$\Delta$ (PolFree)	-0.59**	0.23	-2.52	0.02
$\Delta$ (PolFree (-1))	0.52*	0.29	1.77	0.09
$\Delta$ (PolFree (-2))	0.83**	0.26	3.18	0.01
ECT (-1)	-1.09***	0.16	-7.55	0.00

*Note:* \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels, respectively

Table 4 also presents the short-term explanatory factors of the conflicts in Pakistan. Military expenditure (*Military*) has a negative significant coefficient for the second lag of the variable, which means that the fight against conflict shows a certain efficiency in the short term. Trade openness (*Open*) also has a negative significant sign for the first and second lags of the variable. This result could mean that economic reforms, by opening up new opportunities, reduce frustration among people, leading to fewer reasons for conflict. Short-term estimates

also indicate that an increase in per capita income tends to fuel conflict, with the *GDPc* coefficient being positive and significant. This result is in line with the conclusions of Caruso and Schneider (2011) based on the theory of “immiserizing modernization”. It may also be linked to the large amount of foreign funds received by the country to fight (or support) terrorism. Education (*Edu*) and political freedom (*PolFree*) both have a negative significant coefficient in level form and a positive significant one for the lagged values. The reason for this positive short-term coefficient for education (*Edu*) may be that investment in human capital takes time to show its effects. For political freedom (*PolFree*), the results indicate that democracy could reduce conflicts in the short term.

#### 4.2.2-The Long-Term Relationship of Conflict

Table 5 presents the long-term estimates of the ARDL procedure. All the coefficients are statistically significant at the 1% or 5% level. The table shows the long-term factors of internal conflict in Pakistan. The results show that a 1% increase in military expenditure (*Military*) would reduce the number of conflict-based incidents by 1%. This finding confirms that military activities can reduce conflicts and maintain order in the long run.

In contrast to the short-term dynamics, the results also highlight a positive relationship between trade openness (*Open*) and internal conflict. The long-term coefficient suggests that a 1% increase in trade openness would result in a 0.28% increase in the number of conflict-based incidents, which confirms the findings of Freytag et al (2010) and Wintrobe (2006). A reason for this positive impact may also be that, with increased economic integration, high cost industries (relative to international competitors) may suffer. This may lead to grievances, which may, in turn, fuel internal conflicts.

**Table 5: ARDL Long-Term Estimates**

Dependent Variable: *Conf*

Regressor	Coefficient	Std. Error	t-Statistic	Prob.
<b>Military</b>	-1.01**	0.29	-3.42	0.00
<b>Open</b>	0.28**	0.08	3.66	0.00
<b>GDPc</b>	5.88**	2.4	2.45	0.02
<b>Edu</b>	-10.96**	5.13	-2.14	0.04
<b>PolFree</b>	-1.96***	0.29	-6.66	0.00
<b>Constant</b>	-41.4*	21.2	-1.95	0.07

*Note:* \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels, respectively

The long-term relationship between GDP per capita and internal conflicts is also found to be positive. The results indicate that a 1% increase in GDP per capita would lead to a 5.8% increase in the number of conflict-based incidents. Our finding, which is consistent with Shahbaz (2012), confirms the result of the short-term dynamics. As Caruso and Schneider (2011) explain, an increase in wealth will not automatically translate into a reduction of conflict, especially if the motivation to fight is not poverty, as is the case in Pakistan.

In contrast to the short-term dynamics, the education variable (*Edu*) shows a significant long-term negative relationship with the conflict variable. The value of the estimated coefficient indicates that a 1% increase in gross primary enrollment would reduce the number of conflict-

based incidents by 0.10%. This result, which is consistent with Collier and Hoeffler (2004), confirms that the benefit of education may take time to be seen. Freytag et al (2010) explain that, for terrorists, the mental reward (life in paradise, becoming a martyr) is more important than the material reward. Wilkens (2011) finds that in Pakistan and Afghanistan, suicide attacks are mostly committed by very young people. Our results suggest that investing in education would help children not to become involved in terrorist activities. More generally, education would give people the tools they need to make their own judgment, as well as to get better jobs.

The results also indicate that, unlike the short-term dynamics, political freedom (*PolFree*) is, in the long term, negatively associated with conflict. This would mean that weak political rights lead to less conflict in the case of Pakistan. This finding is similar to that of Eubank and Winberg (1998) and of Li and Schaub (2004). In fact, Pakistan has experienced more internal conflicts in democratic periods than in autocratic periods<sup>13</sup>. It can be argued that when democracy prevails in a fragile and conflict-ridden country like Pakistan, it gives the extremists more freedom of press, movement, and expression, thus reducing their organizational costs. Conflicts and terrorism can be controlled in a democracy through a mechanism of strict application of law and order. Unfortunately, this is not the case in Pakistan.

### 4.3- Diagnostic Tests

The Breusch-Godfrey series correlation test and the Breusch-Pagan-Godfrey test for heteroscedasticity were used for the validity and reliability of the estimates. The results for both tests are given in Table 6.

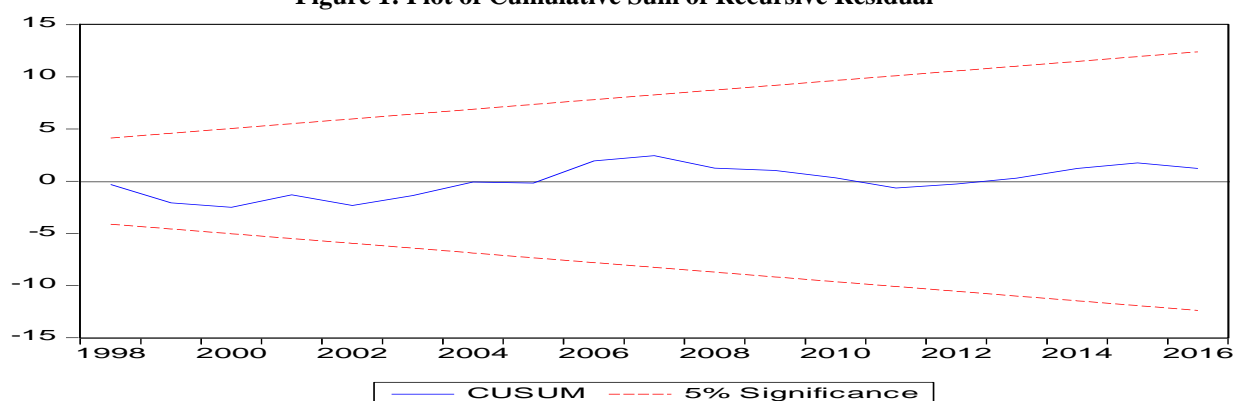
**Table 6: Diagnostic tests**

<b>Breusch-Godfrey Serial Correlation LM Test</b>			
Observations	* R-squared	5.42	Prob. Chi-Square (3)
			0.14
<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>			
Observations	*R-squared	18.88	Prob. Chi-Square (19)
			0.46

Table 6 shows that the probability of serial correlation and heteroskedasticity tests is greater than 0.05. This indicates that the null hypothesis is accepted and that the residuals in the estimates are homoscedastic and do not undergo serial correlation.

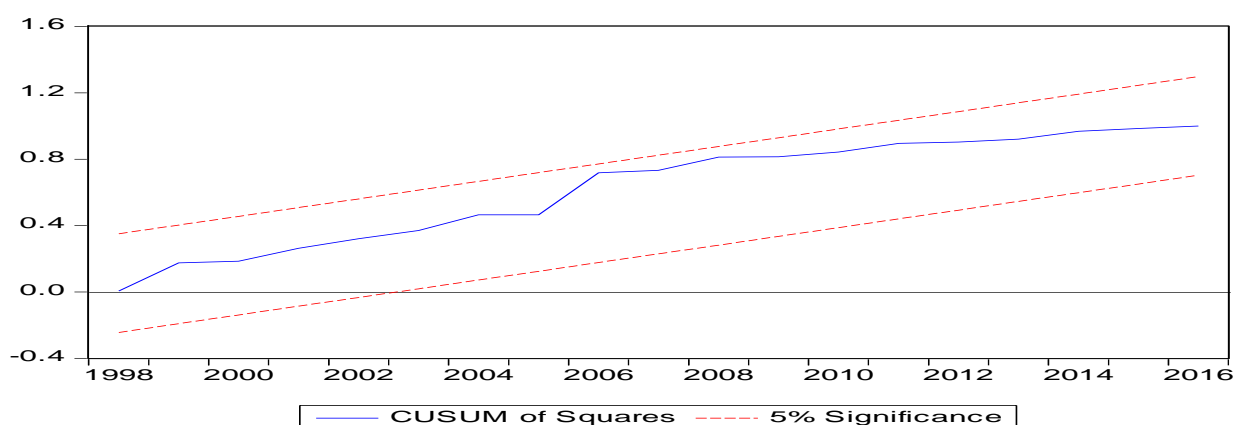
<sup>13</sup> See Global Terrorism Database. (GDT, 2017).

**Figure 1: Plot of Cumulative Sum of Recursive Residual**



To verify the long-term stability of the model coefficients, this study applied the CUSUM and CUSUMSQ tests. The results imply that the plots (blue line) are within the critical bound of 5% significance level. This shows that all the coefficients of the estimated error correction model are stable and can be used for policy recommendations.

**Figure 2: Plot of Cumulative Sum of Square of Recursive Residual**



#### 4.4- The Relation between Growth and Conflict

The direction of the relation between GDP per capita and the conflict variable can be deduced from the estimation of the growth equation (Eq 2b). The results show that, in the long term, the model does not converge to an equilibrium determined by Conflict. As shown in Table 8 of the Appendix, the ECT coefficient in the error correction representation is positive. This finding indicates that conflict is not part of the long-term equilibrium of GDP per capita and that it is GDP per capita that explains conflict in the long-run in Pakistan (Eq 1b and Table 4), and not conflict that contributes to the long-term growth of the country. In other words, although conflicts seem to stimulate growth in the short term (see Table 8), perhaps because of the importance of external funds made available to stakeholders to fight (or support) terrorism, this impact does not seem to last and does not seem to affect (neither positively nor negatively) the country's long-term growth performance.

This finding is confirmed when estimating the long-term coefficients of the GDP equation (Eq 2a), which is not significant for the conflict variable (see Table 9 of the Appendix). The results also indicate that no other variable seems to contribute to the country's long-term

growth, because all the long-term coefficients are insignificant. This result may mean that Pakistan's long-term dynamics are due to a long period of conflict and political instability, highlighting the need for a stable environment to see the results of economic, political and social reforms. Pakistan may be caught in a low-growth trap, where conflict is the key variable to address before embarking on better policies. This conclusion can be extended to short-term dynamics, since almost none of the explanatory variables of the GDP equation seem to show a stable relationship with the country's performance (see Table 8).

## **5- Conclusion**

In this article, we study the long-term relationship between internal conflict, economic growth, and human development in Pakistan. We explore different reasons for conflict in the country, as well as different theories and empirical determinants. In addition to explaining internal conflicts, we investigate their cost in terms of economic growth and human development. By studying the long-term relationship between internal conflict, economic growth, and human development we show that human capital is an important factor for mitigating conflicts in the country. This finding underscores that investing in education, by providing better opportunities and reducing radicalization, would contribute to a more stable and prosperous economy. This result contrasts with the high defense spending of the Pakistani government, whose spending on education has been very low (Benz, 2016). Our findings also show a long-term contribution of law and order (as measured by military expenditure) to the reduction of internal conflicts. This result justifies the government's counter-terrorism policy, as shown by Feridun and Shahbaz (2010).

On the contrary, it appears that wealth and economic reforms do not contribute to reducing internal conflicts in Pakistan, because long-term GDP per capita and trade openness show a positive impact on the number of conflict incidents. These findings are similar to those of Freitag et al (2010) who showed that globalization contributes to conflicts when it is perceived as a threat by part of the population. Ismail and Amjad (2014) also justify the positive impact of per capita GDP on conflict through the “immiserizing modernization theory”, which argues that economic growth can fuel political and social unrest. Political rights and civil liberties do not seem to reduce conflict in Pakistan either, because democratic periods have seen a resurgence of violence in the country. This result could mean that, in a fragile and unstable country like Pakistan, respect for public order is a priority before restoring democracy.

With regard to the direction of the link, it would seem that the relationship moves from GDP per capita to internal conflict, which means that conflicts do not contribute (positively or negatively) to the long-term growth of the economy. Per capita GDP also does not appear to be sensitive to economic reforms, education, military spending, or political rights and civil liberties, since none of these variables appears to be significant in the long term. This could mean that, because of a long-lasting conflict situation, Pakistan is caught in a low development trap in which internal conflict is the key variable to address before seeing the benefits of reforming the economy.

## **Appendix**

**Table 7: Descriptive Statistics**

Variables	Conf (log)	Edu (%)	Open (%)	PolFree (%)	Military (%)	Gdpc (log)
Mean	3.94	72.7	29.7	4.8	5.5	10.09
Median	3.97	71.4	29.7	4.5	6.0	10.09
Maximum	7.70	98.8	39.1	6.0	7.6	10.63
Minimum	0.00	49.1	22.9	3.0	3.3	9.51
Std. Dev.	2.28	16.5	3.3	0.8	1.5	0.36
Skewness	-0.10	0.1	0.2	-0.1	-0.2	-0.04
Kurtosis	1.95	1.6	3.5	2.4	1.4	1.71
Jarque-Bera	2.05	3.8	0.9	0.7	4.6	2.99
Probability	0.36	0.2	0.6	0.7	0.1	0.22

Table 7 shows the descriptive statistics of all variables. Our data set consists of 43 annual observations from 1974 to 2016. For a normal distribution, skewness is zero and the expected value for kurtosis is 3. All variables are negatively skewed except *Edu* and *Open* as they are right skewed. Kurtosis analysis shows that only *Open* is leptokurtic, while all other variables are platykurtic. Jarque-Bera test (JB) states that the residuals are normal as the probability of JB test for all variables is higher than 0.05.

**Table 8: Error Correction Model (ECM) Estimates**Dependent Variable: *Gdpc*

Regressors	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta$ (Gdpc (-1))	-0.37***	0.12	-2.99	0.00
$\Delta$ (Conf)	0.01**	0.0	2.47	0.02
$\Delta$ (Conf (-1))	0.02***	0.004	4.27	0.00
$\Delta$ (Military)	-0.08***	0.01	-6.12	0.00
$\Delta$ (Military (-1))	-0.01	0.02	-0.73	0.47
$\Delta$ (Military (-2))	0.07***	0.01	4.77	0.00
$\Delta$ (Open)	-0.01***	0.00	-3.89	0.00
$\Delta$ (Open(-1))	0.00*	0.00	1.85	0.08
$\Delta$ (Edu)	-0.15	0.12	-1.32	0.20
$\Delta$ (Edu(-1))	-0.28**	0.01	-2.86	0.01
$\Delta$ (Edu(-2))	0.30***	0.09	3.25	0.00
$\Delta$ (PolFree)	0.04***	0.01	4.75	0.00
$\Delta$ (PolFree (-1))	0.03***	0.01	3.25	0.00
ECT (-1)	0.13***	0.02	8.92	0.00

*Note:* \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels, respectively

**Table 9 ARDL Long Run Estimates**Dependent Variable: *Gdpc*

Regressors	Coefficient	Std. Error	t-Statistic	Prob.
Conf	0.03	0.06	0.55	0.59
Military	-0.08	0.17	-0.65	0.52



<b>Open</b>	0.07	0.05	1.19	0.25
<b>Edu</b>	1.1	1.19	0.93	0.37
<b>PolFree</b>	-0.14	0.18	-0.77	0.45
<b>Constant</b>	7.97*	1.16	6.89	0.00

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*Note:* \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels, respectively

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