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Building peace through education: Case of India and Pakistan conflict

By Dawood MAMOON [a†]
& Mansoob MURSHED [b]

Abstract. The paper utilises unique conflict data set from literature to capture different aspects of India and Pakistan conflict and analyses the role of education in peace building between the two countries. Education not only directly eases hostilities but it also puts a positive effect on economic growth rates and democratic values in both countries that in return further reduce tensions in dyadic conflict proxies.
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1. Introduction

Conflict transformation is a process of engaging with and transforming the relationships, interests, discourses and, if necessary, the very constitution of society that supports the continuation of violent conflict. The UN Secretary General's (2009) report on peace building identifies a number of recurring priorities in conflict affected situations establishing security, building confidence in a political process, delivering initial peace dividends and expanding core national capacity. These priorities include the provision of basic services such as water and sanitation, health and primary education. However in conflict affected situations education is also about more than service delivery because it is also a means of socialisation and identity development through transmission of knowledge, skills, values and attitudes across generations. Education may therefore be a way of contributing to conflict transformation and peacebuilding. Furthermore, the societies that promote multiculturism and give rights to individuals based on various ethnicities and religious identities also promote peaceful behaviours within their populations that then becomes a national discourse for a peaceful behaviour beyond national borders (Hagg & Kagwanja, 2007). It is thus a right conjecture that democracies donot fight with each other and focus on economic, political and social empowerment of their populations by

[†a] World Economic Survey Expert Group, Pakistan.
☎. + 0092 311 5082056 ✉. dawoodmamoon96@gmail.com
[b] Institute of Social Studies (ISS), Kortenaerkade 12, 2518 AX, The Hague, The Netherlands.
☎. *+31 70 4260591* ✉. murshed@iss.nl

practicing schema of economic development that may also mean trading with neighbours and peacefully competing in international markets through harnessing and developing such good governance practices that improve local and national competitiveness (Mousseau, 2000). Achieving higher levels of education is one important mean to promote peaceful co-existence within national borders and beyond when societies are governed under strong democratic precedence. Education enables tolerant behaviour among people for opposing point of views and provides rational for objective analysis of historic grievances that may always be resolved by working for common interests that may include important economic concepts like poverty alleviation like in the case of for example India and Pakistan. Both countries have historic grievances towards each other that have a genesis in Kashmir dispute. The poverty levels in India and Pakistan are high and their respective populations are less educated when compared to democracies in OECD countries for example. Traditionally hostilities have been high between India and Pakistan for last 70 years since their independence from the British in 1947 (Murshed & Mamoon, 2010).

One of the most salient link of education with international conflict mitigation is that educated populations can work through information asymmetries (Stiglitz, 1989) to collectively reach rational conclusions and solutions that may include a discourse that promotes peace within the society and outside its national borders. Higher levels of education within the population of a nation state provides rich atmosphere of national debate on issues that can see through multiple religious, ethnic and national identities to form a common understanding that drives its motivation from common good for humanity. Educated populations have the capacity to look beyond historical grievances to promote common interests for the other as it is evident from the example of European Union where countries like Germany, Austria and France have emerged as one economy despite having a history of violent conflict translating into World War 1 and World War 2 (Tomka, 2013; Paxton & Hessler, 2011). In addition to historic grievances like land disputes, outright war or hostilities with neighbours suggest that nation states may have failed to resolve information asymmetries arising out of political and economic outcomes that favour one party over the other. Rationality of common interest arising out of educated population that can be reflective of other point of view may take economic and political biases not as a matter of grievance but as a source of healthy competition working as an incentive to implement reforms in economy or society within the confine of national borders (Mousseau, 2000). The reforms within national border of developing countries like India and Pakistan may mean improving rule of law; better facilitation through strong regulatory authorities; improved access to international markets to trade with rest of the world; and bringing inclusive economic policies with better democratic precedence for the domestic polity (Mamoon & Murshed, 2017). Promoting secular identities within religious democracies like Pakistan may mean implementation of

such educational syllabus that do not discriminate population based on religion, ethnicity or gender but promotes global and regional identities within the ambit of being a Pakistani (Mamoon, 2018). Change in psycho-social perceptions are important for conflict resolution but more resources channelled towards higher education also mean less military expenditures indicating the shift of the national government towards social uplift of the population and less focus on belligerence towards neighbours. Thus educated population signals towards nation's commitment to peace and rise in opportunity costs for hostility towards neighbours through military build ups (Brauer & Gissy, 2017).

This paper analyses the role of education in providing motivations for peace between India and Pakistan in a multivariable model that also include key variables of interest like democracy (Democratic Peace), international trade (Liberal Peace) and military expenditures (Deterrence or Belligerence).

2. Methodology

Any simple least square regression analysis between education and conflict with proxies of liberal and democratic peace and actions of deterrence as controls may lead to spurious results because of endogeneity problems among the variables (from trade, military spending, social sector expenditure and growth to conflict and vice-versa). It seems necessary to utilise a simultaneous equation model to address potential endogeneity problems between various variables. Since the data is a time-series, it is appropriate to use Vector Autoregressive model (VAR), which is an extension of univariate Autoregressive (AR) models to capture the evolution and the interdependencies between multiple time-series (Sims, 1980). Treat all variables in a VAR symmetrically by including an equation for each variable explaining its evolution based on its own lags and the lags of other variables in the model. The number of equations in a VAR model depends upon the number of endogenous variables; each endogenous variable is regressed on its lagged value, and the lagged values of all other endogenous variables as well as any number of exogenous variables. This solves the problem of endogeneity among variables. In this sense, VAR model is a seemingly unrelated regression (SUR) model with lagged variables and/or deterministic terms as common regressors so that one can interpret the regression results for each equation as ordinary least square estimators.

The basic $p-$lag vector autoregressive (VAR(p)) model has the form

$$Y_t = c + \Pi_1 y_{t-1} + \Pi_2 y_{t-2} + ... + \Pi_p y_{t-p} + \varepsilon_t \qquad (1)$$

where c is a $(n \times 1)$ vector of constants (intercept), Π_i is a $(n \times n)$ matrix (for every $i = 1,...., p$) and ε_t is a $(n \times 1)$ vector of error terms.

A bivariate VAR(2) can be written as the following system of equations:

$$y_{1t} = c_1 + \Pi^1_{1,1} y_{1,t-1} + \Pi^1_{1,2} y_{2,t-1} + \Pi^2_{1,1} y_{1,t-2} + \Pi^2_{1,2} y_{2,t-2} + \varepsilon_{1t} \quad (2)$$

$$y_{2t} = c_2 + \Pi^1_{2,1} y_{1,t-1} + \Pi^1_{2,2} y_{2,t-1} + \Pi^2_{2,1} y_{1,t-2} + \Pi^2_{2,2} y_{2,t-2} + \varepsilon_{2t} \quad (3)$$

The lag length p has to be determined by model selection criterion (MSC) because too many lagged terms will consume more degrees of freedom and may introduce the problem of multicollinearity. Introducing too few lags will lead to specification errors. One way of deciding this question is to use Akaike (AIC), Schwarz-Bayesian (BIC) or Hannan Quinn (HQ) criteria and choose the model that gives the lowest values of these criteria. AIC criterion asymptotically overestimates the order with positive probability, whereas BIC and HQ criterion estimate the order consistently under general conditions if the true order p is less than or equal to $p\max$.

After fitting a VAR, it may be important to know which way causalities run. One way to do that is by running Granger causality tests after the VAR analysis. In a bivariate VAR model, a variable y_2 is said to Granger-cause a variable y_1 if, given the past values of y_1, past values of y_2 are useful for predicting y_1 (Granger, 1969). Similarly it is feasible to extend the current analysis to test Granger-causality for multivariate VAR (p), where $Y_t = (y_{1t}, y_{2t}, ..., y_{nt})'$.

3. Results with VAR models

This section reports the results of the multivariate VAR regression analysis. Proxies treated as endogenous variables include those for conflict, multilateral trade, economic progress, military burden and education, whereas the concepts treated as purely exogenous are dyadic democracy and population. Before carrying out the regression analysis, a test for stationarity is in order for all dyadic variables employed in the analysis. If any of the time-series variables are non-stationary, the research takes appropriate lags to solve for autocorrelation. Stationarity tests use the modified Dicky-Fuller t-test, also known as the DF-GLS test proposed by Elliot, Rothenberg & Stock (1996). Table 1 provides unit-root test results based on these criteria.

Table 1 shows that nearly all variables have unit roots. Since, these time-series variables are stationary at levels, although with some time lags, this allows the use of unrestricted VAR analysis instead of restricted VECM methodology. It is now possible to proceed to VAR analysis. The reduced form VAR model for conflict is as follows

$$Conf_t = \alpha_1 + \alpha_{2,t-i} Conf_{t-i} + \alpha_{3,t-i} Tr_{t-i} + \alpha_{4,t-i} Mil_{t-i} + \alpha_{5,t-i} E_{t-i} + \alpha_{6,t-i} G_{t-i} + \alpha_7 Demo_t + \alpha_8 P_t + \mathrm{E}_t \quad (4)$$

Where $Conf_t$, Tr_{t-i} , Mil_{t-i} , E_{t-i} , G_{t-i} , $Demo_t$ and P_t depict interstate conflict, multilateral trade, military burden, education expenditure, real growth rate of GDP per-capita, dyadic democracy score and population respectively; t ranges from 1950-2007 and $i = 1,...., p$. Here p is the optimal lag structure for the VAR model. $\alpha_{2,t-i}$ $\alpha_{3,t-i}$ $\alpha_{4,t-i}$ $\alpha_{5,t-i}$ and $\alpha_{6,t-i}$ are (6×6) metrics (for every $i = 1,...., p$).

Running the above model for the number of fatalities (*Fatal*), best captures the severity of the militarised conflict between the two nations.

Table 1. *DF-GLS unit root tests*

Variables	Lag length	With intercept	With intercept and trend
Fatal	1	-3.528* (Ng-Perron)	-3.774* (Ng-Perron)
Xmpi	2	-2.710* (Ng-Perron)	-2.860*** (Ng-Perron)
Xmip	8	-4.951* (MAIC)	-4.923* (MAIC)
Lxpi1	0	2.951** (D-Fuller)	2.951** (D-Fuller)
Lxpi2	0	-4.769* (SIC)	-4.929* (SIC)
Lmpi1	1	-4.049* (SIC)	-3.961* (SIC)
Lmpi2	1	-4.511* (SIC)	-4.382* (SIC)
Lmilbrd	0	-	-4.308* (SIC)
Ledupi1	1	-	-5.374* (SIC)
Ledupi2	1	-	-5.478* (SIC)
Ledupi3	1	-5.918* (SIC)	-5.907* (SIC)
Ledupi4	1	-	-5.642* (SIC)
Gpi	0	-4.256* (Ng-Perron)	-4.276* (Ng-Perron)
Demopi	7	-2.790* (Ng-Perron)	-2.997* (Ng-Perron)
Poppi	10	-	-7.392* (MAIC)

Notes: -*, ** and *** shows significance at 1%, 5% and 10% level; - The Lag structure is selected through (1) Ng - Perron sequential t (Ng-Perron), (2) the minimum Schwarz information criterion (SIC), (3) the Ng-Perron modified information criterion (MAIC) and (4) Dickey-Fuller test (D-Fuller).

Table 2. *VAR regression equations for fatal under multiple specifications of education*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Social Development												
Ledupi1(2)	-7.70*	-7.13*	-7.01*									
Ledupi2(2)				-8.17*	-7.52*	-7.44*						
Ledupi3(2)							-4.06***	-6.29*	-5.79*			
Ledupi4(2)										-7.96*	-8.93*	-8.91*
Multilateral Trade												
Xmip(8)	-2.68			-2.68			-3.92***			-3.14		
Lxpi1(1)		-3.96*			-3.92*			-5.46*			-4.74*	
Lxpi2(1)			-4.78*			-4.75*			-6.35*			-5.76*
Military Burden[¶]												
Lmilbrd (1)	2.26	3.50**	2.42***	2.44	3.62*	2.58***	-0.96	2.02***	0.45	0.51	2.73**	1.52
Economic Growth												
Gpi (1)	-0.36*	-0.35*	-0.39*	-0.37*	-0.36*	-0.39*	-0.42*	-0.41*	-0.45*	-0.39*	-0.38*	-0.42*
Exogenous Variables												
Demopi (7)	-0.006*	-0.003***	-0.003	-0.006*	-0.004*	-0.003	-0.005*	-0.001	-0.001	-0.006*	-0.003***	-0.002
Poppi (10)	0.101*	0.154*	0.103	0.107*	0.158*	0.109*	0.031*	0.107*	0.038*	0.021	0.087*	0.028**
N	45	45	45	45	45	45	45	45	45	45	45	45
R2	0.47	0.54	0.55	0.47	0.55	0.55	0.39	0.53	0.53	0.44	0.55	0.56
VAR(p)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)	VAR(1)

Notes: -*, **, *** shows significance at 1%, 5% and 10% level; - VAR(p) reports lag-order for each VAR model based on final prediction error (FPE), Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC) and the Hannan and Quinn information criterion (HQIC).

The paper employs four different dyadic proxies of education expenditures. (a) Weighted average of Percapita education expenditures for India and Pakistan (Ledupi1) (b) Indian education expenditure as percentage of Pakistan's education expenditure (Ledupi2) (c) Pakistan's education expenditure as a percentage of Indian education expenditure (Ledupi3) (d) GDP weighted average of India and Pakistan education expenditure (Ledupi4)

This research investigates potential for education in conflict mitigation in detail by employing these four proxies of education expenditure, with three different combinations of multilateral trade, while using *Lmilbrd* as a common proxy for military burden. Efforts to improve human capital by allocating more funds to education is a strong determinant of conflict mitigation as the results demonstrate. All four proxies of education expenditurealways enter the conflict regression equation with a negative sign, and are significant in all specifications. The high values of $\alpha_{5,t-i}$ indicate that channelling resources to the development sector in general, and investment in education in particular, may go a long way in building peace. Furthermore, the inverse ratios in Ledupi2 and Ledupi3 suggest that per capita education expenditures in both India and Pakistan are low and increase in budgetary allocations to education expenditures in both countries would suggest that hostilities between the two neighbours have significantly reduced. If Indian education budgets rise at a greater proportion than Pakistan's or Pakistan's budgetary allocations to education sector rise at faster pace than Indian, hostilities between the two countries will fall either way. Further more the inverse ratio confirms that it is necessary for both countries to focus on social development to eventually put downward pressure on hostilities as military expenditures are at very high levels for both countries. This also means that military budgets donot only show belligerence but there is also presence of deterrence since both countries should focus more on education than defence to uplift their society from poverty by putting more emphasis on peace building.

The weighted average of Pakistan and Indian per-capita growth rates (*Gpi*) relate negatively and significantly with *Fatal* in all specifications confirming the hypothesis that countries are more peaceful when they are moving forward economically. The combined democracy score (*Demopi*) relates negatively to conflict, and is significant. However, the low values of democracy coefficients suggest that political orientation played a limited role in the India-Pakistan conflict. The results in table 2 also show that the high levels of population where a significant proportion are uneducated and poor on both sides, contribute positively to the conflict, although the effect is small. The results on *Xmip*, *Lxpi1* and *Lxpi2* confirm yet again (i.e, see Murshed & Mamoon, 2010) that India and Pakistan should open up further, as conflict mitigation is highly responsive to multilateral trade. In other words, it is possible to conclude that a lower military burden would mean both countries could invest more on education and that higher multilateral trade combined with increased education levels will positively

contribute to peace between Pakistan and India on a sustainable basis. Although democracy is also good for peace, economics clearly trumps democracy as a conflict-mitigating factor.

It would be interesting to run multivariate Granger causality tests to see if causality runs from the determinants of conflicttoconflict, and whether there are cases of reverse causality. Reduction of hostilities would favourably affect the military burden in both countries, and both India and Pakistan could have more resources to channel towards its development and poverty reduction strategies. The reverse causality observed in table 3 from conflict to education expenditure could explain this process.Reverse causality between conflict measures and proxies of education expenditure highlight the resource constraints faced by both sides due to their rivalry where funds allocated to defence seem to crowd out public investment in the development sector. The growth patterns of both countries are independent of conflict, as far as reverse causality is concerned. The relationship is highly significant at a one per cent level in all the observed instances of Table 2. Any slowdown in growth rates in either of the two nations seems to correlate positively with conflict and this trend has been present since 1950.

Table 3. *Granger causality Wald tests*

Direction of Causality	Causes	RC
$Ledupi1 \rightarrow Fatal$	(√)*	(√)*
$Ledupi2 \rightarrow Fatal$	(√)*	(√)*
$Ledupi3 \rightarrow Fatal$	(√)*	×
$Ledupi4 \rightarrow Fatal$	(√)*	(√)***
$Xmpi \rightarrow Fatal$	(√)**	×
$Xmip \rightarrow Fatal$	(√)*	×
$Lxpi1 \rightarrow Fatal$	(√)*	×
$Lxpi2 \rightarrow Fatal$	(√)*	×
$Gpi \rightarrow Fatal$	(√)***	×
$Demopi \rightarrow Fatal$	(√)*	(√)*
$Lmilbrd \rightarrow fatal$	(√)*	(√)***

Notes: *, **, *** shows significance at 1%, 5% and 10% level, RC stands for reverse causation, √ means causes and × means not causes.

4. Conclusions

Our analysis suggests that investment in social development by improving the educational attainment of the populations in India and Pakistan may pave the way for an environment of peace between both countries. The importance of education is underlined in peace and conflict research. Although the practice of drawing on local cultural resources in the management of conflicts and violent memories is gaining acceptance, cultural traditions are arbitrary historical constructs and highly inconsistent. The issue on educational work is how a country's cultural resources can be utilised without reverting to ethno-cultural

stigmatisation. A conscious awareness of one's own and others' prejudices, interests and emotions helps to promote empathy. The ability to see things from another perspective opens up creative alternatives. These socio-psycological skills that constitute self awareness, empathy and critical judgement provide an important basis for the development of conflict resolution techniques. Sustained conflict transformation also requires a conscious reappraisal of one's own and prevailing attitudes to conflict. Conflict dynamics and their potential for change must be experienced in a real form (Maringer & Steinweg, 1997).

Appendix

Data and Sources

	Variables Dyadic Variables	Sources
	Conflict	
Fatal	Annual fatality level of conflict between Pakistan and India, scores from 0 to 6 0 None 1-25 Deaths 26-100 Deaths 101-250 Deaths 251-500 Deaths 501-999 Deaths 6 >999 Deaths	Years: 1950-2003, Sources: COW Inter-State War Data, Version 3.02, Faten et al., (2004)
	Education	
Ledupi1:,	Log weighted average of India and Pakistan's per capita education expenditures	Years: 1950 to 2007 Sources: Pakistan Economic Survey, Indian Economic Survey, Education Statistics 2008 (World Bank), International Financial Statistics 2008 (IMF)
Ledupi2	Log of Pakistan's per capita education expenditure as a ratio of India's per capita education expenditures	Years: 1950 to 2007 Sources: Pakistan Economic Survey, Indian Economic Survey, Education Statistics 2008 (World Bank), International Financial Statistics 2008 (IMF)
Ledupi3	Log of India's per capita education expenditure as a ratio of Pakistan's per capita education expenditures	Years: 1950 to 2007 Sources: Pakistan Economic Survey, Indian Economic Survey, Education Statistics 2008 (World Bank), International Financial Statistics 2008 (IMF)
Ledupi4	Log of GDP weighted average of India and Pakistan's education expenditures	Years: 1950 to 2007 Sources: Pakistan Economic Survey, Indian Economic Survey, Education Statistics 2008 (World Bank), International Financial Statistics 2008 (IMF)
	Multilateral Trade	
Xmpi	Pakistan's total trade (exports + imports) as a ratio of India's total trade (exports + imports),	Years: 1950-2001, Source: International Financial Statistics 2006 (IMF)
Xmip	India's total trade (exports + imports) as a ratio of Pakistan's total trade (exports + imports),	Years: 1950-2001, Source: International Financial Statistics 2006 (IMF)
Lmpi1	Log GDP weighted average of Pakistan and India's total imports,	Years: 1950-2005, Source: International Financial Statistics 2006 (IMF)
Lmpi2	Log mean average of Pakistan's total imports as a proportion of Pakistan's GDP and India's total imports as a ratio of India's GDP,	Years: 1950-2005, Source: International Financial Statistics 2006 (IMF)
Lxpi1	Log GDP weighted average of Pakistan and India's total exports,	Years: 1950-2001, Source: International Financial Statistics 2006 (IMF)
Lxpi2	Log mean average of Pakistan's total exports over Pakistan's GDP and India's total exports over India's GDP,	Years: 1950-2001, Source: International Financial Statistics 2006 (IMF)
	Military Burden	
Lmilbrd	Log GDP weighted average of Pakistan and India's defence expenditures,	Years: 1950-2005, Sources: Correlates to war data set version 3.02, World Development Indicators 2006 (World Bank), Government Finance Statistics Year Book (IMF), Economic Survey of Pakistan, Economic Survey of India
	Economic Growth	
Gpi	Weighted average of real GDP per capita growth rates for Pakistan and India,	Years: 1950 to 2005. Sources: Pakistan Economic Survey, Indian Economic Survey, International Financial Statistics 2006 (IMF)
	Democracy	
Demopi	Pakistan and India's combined democracy score (by adding 10 to India and Pakistan's Polity2 values for each year and then taking the product of these values in order to convert the variable in dyadic form),	Years: 1950-2003, Source: Polity IV Project (Centre for International Development and Conflict Management)
	Population	
Poppi	Average of Pakistan's total population and India's total population	Years: 1950-2001, Source: International Financial Statistics 2006 (IMF)

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