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Conflict and Choice of Study at University Level: Evidence from Pakistan

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Abstract

Conflict, and violence related events have been found to have significant effects on the cognitive thinking and mental well-being of individuals. Although there is ample evidence suggesting negative association of conflict with schooling outcomes, there is non-existent research on how violence can impact degree choices made by students at the university level. By using university level admissions data between 2014 and 2016 from Pakistan, this paper examines the differential in preference for degree choices of students who live in conflict-affected areas compared to students who live in conflict-free areas. The results show that students exposed to violence were less likely to apply to a mathematics pre-requisite degree when compared to students living in conflict-free districts. Future research should focus on the mechanisms through which conflict impacts choice of degree at university level, which in return may be associated with differential in labor market outcomes.

Keywords: *Keywords: Conflict; violence; degree choice; student performance.*

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Conflict and Choice of Study at University Level: Evidence from Pakistan

Abbas Ali Gillani and Xiaocheng Hu

Conflict has been a source of great disturbance to populations, with definitive consequences on poverty (Maurer, 2018), health outcomes (Yehuda, 1998; Suomalainen et al., 2020), and educational attainment (Huagan, 2016). Violence has forced people to change their behavior and decision making with regards to employment (Brodeur, 2018), schooling decisions (Shemyakina, 2010; Hanushek et al., 2016), and with whom to socialize (Antonius, 2015). Brodeur (2018) examines the economic consequences of terror attacks on U.S. soil on employment and total earnings, finding that violent attacks reduce the number of jobs by two percent in the years following the attack. Similar outcomes are also presented by Abadie et al. (2008) who conclude that exposure to violence has a direct impact on an individual's employment status and ability to do business. Greenbaum et al. (2007) conclude that terror attacks in Italy reduced the number of firms and total employment due to reduced business formations. Recently, the number of ongoing violent conflicts around the world has increased from a total of 83 in 2006 to a total of 188 in 2016, with the greatest number of increases in conflicts recorded in Asia (Smith, 2018).

Ample evidence suggests that exposure to violence affects student's educational outcomes (Alderman et al., 2006; Leon, 2012). Violence disrupts school routines (Justino et al., 2013), increases teacher and student absenteeism (Gershenson et al., 2015), and causes major psychological distress to students (Scrimin et al., 2006; Littleton et al., 2009). Moreover, negative shocks to schooling can also adversely affect test scores and enrolments in educational institutions. Furthermore, exposure to violence can not only result in reduction of educational access and attainment in the short run (Akresh et al., 2007; Chamarbagwala et al., 2010), but also have a negative impact on an individual's educational output decades after the conflict is over (Ichino et al., 2004). Akbulut (2009) provides causal evidence on the long-run negative consequences of violence driven large-scale physical destruction on the educational attainment and labor market outcomes.

Moving on, numerous studies have suggested that a varying level of schooling, especially studying different degrees at the university level results in large differences in earnings. Iannelli (2013) highlights the importance of choice of degree at the university level in terms of social mobility and determines a significant correlation between choice of degree at the university level and employment prospects. Grogger et al. (1995) find that one-quarter

of the change in the university wage premium for men was driven by a shift from studying a low-return yielding degree to a high-return yielding degree. James et al. (1989) conclude that students sort their choice of degree at the university level as a function of the earning differences in the labor market. Finally, differences in student ability and aptitudes are suggested to influence choice of degree at the university level (Turner et al., 1999).

While sufficient literature exists on the impact of conflict on educational outcomes at the school level (Leon, 2012; Justino et al., 2013; Gershenson et al., 2015), and the impact of studying various degrees at the university level on labor market outcomes (Jannelli, 2013; Turner et al., 1999), there is non-existent research on the effects of conflict on the choice of degree studied at the university level. Hence, this study investigates whether exposure to violence affects choice of degree at the university level, which in turn may have consequences on an individual's labor market outcomes.

Pooled cross-sectional university level admissions data was obtained from the Institute of Business Administration, Karachi (Pakistan) between the years 2014 and 2016. In line with the literature (e.g., Monteiro et al., 2017), in order to identify causal effects, the occurrence of conflict in each district is calibrated with the distance of each district to the source of violence i.e., militant's headquarters. The results provide evidence that there is indeed a causal relationship between exposure to violence and the choice of degree at the university level. Students, who lived in districts exposed to violence between 2007 and 2011 (identified as the first phase of conflict in Pakistan) were 48.7 percent less likely to apply to a mathematics prerequisite degree compared to students who lived in conflict-free districts. Even after 2011, when Pakistan experienced a different nature of conflict (identified as the second phase of conflict), students who lived in districts exposed to violence were also 11.9 percent less likely to apply to a mathematics prerequisite degree when compared to students who lived in conflict-free districts. Moreover, the estimates also suggest a negative impact of the post-2011 conflict on students' entrance test outcomes. Students who lived in conflict affected districts were 9 percent less likely to pass the entrance exam, while they also scored 51 percent points lower on the mathematics component of the entrance exam.

There are several contributions to the existing literature within this paper. First, the causal relationship between conflict experienced during schooling years and its impact on the choice of degree chosen at the university level is being examined for the first time. This is extremely relevant for communities and countries in which exposure to violence during schooling years is relatively high and barriers to education exist. Second, since the paper concludes that conflict does indeed have an effect on an individual's decision regarding degree

choices at the university level, which in return is associated with labor market outcomes, this would imply that the effects of conflict are not only limited to school participation and test scores but can also impact the employability and earning capacity of a student. Third, the data used for this study is unique; used for the first time to study the effects of violence witnessed in Pakistan. Fourth, the results of this paper pave a way for future research focusing on quantifying the effects of conflict on labor market outcomes through altering choice of degree at the university level.

Background of the Conflict in Pakistan

Tehreek-e-Taliban Pakistan (TTP) is considered the largest militant organization in Pakistan, formed in response to the presence of international security forces in Pakistan and Afghanistan, following the attacks on the U.S. soil on September 11, 2001 (Center for International Security Cooperation, 2018). Linked to Al-Qaeda, and also associated with the Taliban in Afghanistan, TTP's core objectives included establishment of a unified militant front to combat the presence of international security forces in Pakistan and Afghanistan, as well as conduct violent attacks against Pakistan's security forces (Yusufzai, 2009).

When Pakistan decided to support the international forces led by the U.S., refused to provide safe havens to the TTP in Pakistan or Afghanistan, and introduced security forces for the first time in the tribal areas along the Pakistan-Afghanistan border, it faced an immediate resistance from the TTPs. Upon restricting the movement of any TTP militants across the extremely porous Pakistan-Afghanistan border and a crack-down on TTP's safe havens in the tribal areas, widespread violence erupted between Pakistan's security forces and the TTP (Rohde, 2006). Clashes escalated into an outright conflict in 2007 when the TTP sieged parts of Pakistan's capital city, Islamabad (Khan, 2011). By 2008, TTP had seized military and administrative control of several tribal areas of Pakistan, establishing its headquarters, and a stronghold central base for operations, near the Pakistan-Afghanistan border in tribal district South Waziristan (Gall et al., 2013). From South Waziristan, the TTP militants trained its soldiers and conducted violent acts across Pakistan. The conflict, which began in 2007, lasted for five years, until 2011, when Pakistan's security forces regained all tribal areas from TTP rule, and took control of all its territory. During this conflict an estimated 5,152 civilians were killed, and 5,678 civilians were injured, whereas 15,681 casualties were suffered by the security forces (Raja, 2013). This period of conflict, from year 2007 till year 2011, during which several districts in Pakistan were directly under the administrative control of the TTP is defined as the first phase of the conflict (2007-2011 conflict).

After 2011, with the continued active presence of the international security forces in Afghanistan, the TTP continued to show resistance against Pakistan's security forces, regrouped to form a second stronghold in district Quetta in southern Balochistan province and continued to carry out violent acts across the country (Khan, 2009). Quetta emerged as a suitable base for operations for the TTP due to its close proximity to Kandahar in Afghanistan which had served as the capital of the Taliban administration in Afghanistan between 1994 and 2001 (Beaumont, 2021). Pakistan continued to experience violence up until 2016 when a peace agreement between the TTP and Pakistan was brokered to end the conflict. This period of conflict, from year 2012 till 2016, during which the TTP governed through its headquarters in Quetta is defined as the second phase of the conflict (post-2011 conflict). Figure 1 shows the presence of TTP in large stretch of areas along the Pakistan-Afghanistan border in year 2011.

Figure 1

Conflict in Pakistan in 2011 (British Broadcasting Corporation, 2011)

Data

Data on Admissions

Individual level data was obtained from the admissions test of Institute of Business Administration (IBA), Pakistan from the years 2014 till 2016. IBA is a public-private partnership university, consistently placed amongst the top ranked universities in Pakistan by

the Higher Education Commission of Pakistan. The university has a student body of 6,000, and 250 faculty members; IBA offers five undergraduate programs for yearly intake of students for degrees of Social Sciences (SS), Accounting and Finance (ACF), Economics (ECO), Computer Sciences (CS) and Business Studies (BBA).

The admissions criteria of the university require everyone applying to the university to have successfully passed the entrance exam. However, the SS, ACF, and BBA degrees do not require an individual to have studied mathematics (math) at the secondary school level before applying to the IBA. Hence, these degrees are collectively classified as non-mathematics-prerequisite degrees (NONMATHPREREQ). On the other hand, the degrees of CS and ECO require an individual to have studied math at the secondary school level before applying to the IBA. These degrees are collectively classified as mathematics-prerequisite degrees (MATHPREREQ).

The admissions test, the intake criteria and the cut-off marks to successfully pass the admissions test is the same for all the degrees within the NONMATHPREREQ degree category. Therefore, the degrees within the NONMATHPREREQ category are considered similar to one another from the perspective of the admissions criteria and are studied collectively as one cohort, rather than individually. The admissions test for the MATHPREREQ degree category is different from the admissions test However, the admissions test, the intake criteria and the cut-off marks to successfully pass the admissions test is the same for all the degrees within the MATHPREREQ degree category. Hence the degrees within the MATHPREREQ category also studied together as one cohort, rather than individually.

Table 1 provides a breakup of the admissions profile for the entrance exam of the university and draws attention to a few admissions related processes. First, due to the high number of applications received each year, IBA offers multiple admissions test cycles for degrees for intake within the same academic year. Second, data for Round 1 indicates far fewer observations than the rest of the admissions rounds. This is because IBA introduced its SS program in year 2013, and conducted its first admissions test specifically for SS in Round 1. Third, all admissions tests between Aug-13 and July-14 were part of the 2014 academic year.

First, all admission tests between Aug-13 and July-14 were part of the academic year 2014, as students who graduated from higher secondary school (students aged 17 to 19) by Aug-13 would have been eligible to apply for the entrance exam in any of the rounds from then onwards. Therefore, for our analysis, we merged the admission rounds into academic periods. In particular, rounds 1 through 4 form the 2014 academic period; rounds 5 through 7 form the 2015 academic period; and round 8 forms the 2016 academic period.

Table 1

Descriptive analysis for applicants appearing for entrance exam

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Academic Year	2014				2015			2016
Test Date	17/11/13	09/03/14	22/06/14	20/07/14	01/03/15	28/06/15	26/07/16	28/02/16
Total Applicants	127	1980	2618	772	2796	2080	881	2173
Average Age	21.3	20.7	20.6	20.6	19.8	19.7	19.6	19.0
Male (%)	41.7	61.6	60.7	69.6	61.6	61.8	69.6	59.8
Districts Applied	9	44	59	32	46	68	37	54
Govt. School (%)	47.2	37.7	49.2	50.1	37.9	48.3	56.8	34.9
Test Passed (%)	35.4	15.0	12.5	40.2	20.8	14.5	28.9	16.0
Math score	70.2	64.6	58.3	68.0	76.9	55.8	49.9	50.3
Degrees Applied	SS	BA/ACF/SS	BA/ACF/SS	ECO/CS	BA/ACF/SS	BA/ACF/SS	ECO/CS	BA/ACF/SS

Second, although the university received 13,847 applications for admissions intake between 2014 and 2016, a total of 10,936 applications were received from the district of Karachi alone where the university is located. These applications would be excluded from the analysis as district Karachi is neither categorized as a conflict district nor as a conflict-free district and hence omitted from the estimation methodology.

Data on Conflict

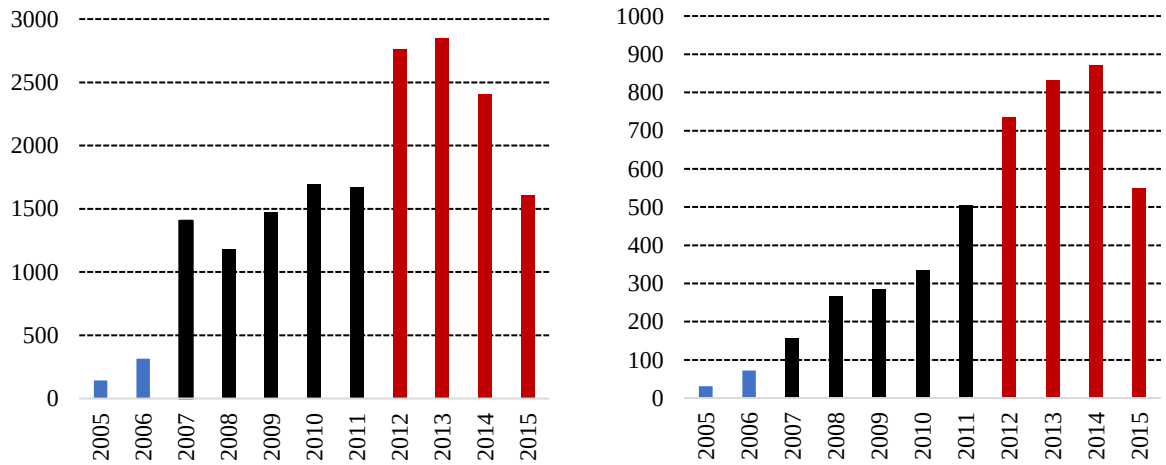
Data on the admissions test is linked to a second set of data, on conflict, gathered and published by the National Consortium for the Study of Terrorism and Responses to Terrorism (START). START is a Department of Homeland Security Center of Excellence headquartered at the University of Maryland and provides information on conflict and violent events from around the world. Information is available on the date, location, and outcome of all terrorist incidents and attacks from across the globe. Data on conflict in Pakistan is collected by START based on the news resources and official government documents. The data acquired from this portal includes total civilian casualties in Pakistan from year 2005, two years prior to the onset of the first phase of the conflict in Pakistan in year 2007, till year 2015, one year prior to the last academic year under analysis in this study.

Figures 2a and 2b summarize the total number of casualties and total number of attacks that caused casualties from 2005 to 2015, respectively. The blue graph for 2005 and 2006

represent the total number of casualties and the total number of attacks with casualties witnessed in Pakistan before the onset of the conflict in 2007. The black graph from 2007 till 2011 represents the total number of casualties and the total number of attacks with casualties witnessed in Pakistan during the first phase of the conflict. The red graph from 2012 till 2015 represents the total number of casualties and the total number of attacks with casualties witnessed in Pakistan during the second phase of the conflict.

Figure 2

Conflict in Pakistan between year 2005 and year 2015



a. Total number of casualties

b. Total number of attacks with causalities

The sudden spike in the total number of casualties from 315 in 2006 to 1406 in 2007, as shown in Figure 2(a), indicates the start of the first phase of the conflict in Pakistan. During the first phase of the conflict from the 2007 till 2011, the number of civilian casualties averaged around 1,500, reaching a peak of 1,699 in 2010. However, with the security forces of Pakistan clearing its tribal areas from militant control, militant retaliation intensified attacks on the civilian population, resulting in even higher casualties in the second phase of the conflict, post-2011. The total number of civilian casualties peaked in the second phase of the conflict at 2,854 in 2013 before declining to 1607 in 2015. The pattern of total number of attacks in Figure 2(b) also highlights the gradual increase in the number of violent activities carried out by militants after the onset of the first phase of the conflict. Although the average number of

attacks carried out between 2007 and 2010 were 250, the attacks intensified when the militants faced direct resistance from the security forces to clear areas of major stronghold. The total number of attacks with casualties increased to 504 in 2011 and continued rising, hitting a peak of 870 attacks in 2014.

Combining Data on Admissions and Conflict

In Pakistan, students typically complete their primary level schooling by the age of 11, followed by the completion of three years of middle level schooling by the age of 14, followed by the completion of three years of secondary level schooling by the age of 17. Thus, students finish their higher secondary level schooling by the age of 19, before enrolling into university.

All those students who applied to the IBA between 2014 and 2016 would have attended secondary or higher secondary school either during the first phase of the conflict, from 2007 to 2011, or during the second phase of the conflict, post-2011. We therefore identify two definitions of conflict as (i) violence witnessed only during the first phase of the conflict (CON0711) and (ii) violence witnessed only during the second phase of the conflict (CON1215). Districts of Pakistan belonging to CON0711 would not have witnessed any violence prior to 2007 before the onset of the first phase of the conflict but have witnessed violence during the first phase of the conflict between 2007 and 2011. Further, districts in the category of CON0711 would not have witnessed any violence after the end of the first phase of the conflict and the onset of the second phase of the conflict, post-2011. Districts of Pakistan belonging to CON1215 would not have witnessed any violence prior to 2007 and also not have witnessed any violence during the first phase of the conflict between 2007 and 2011. However, districts in the category of CON1215 would have witnessed violence in any of the years after 2011, the onset of the second phase of the conflict. Districts that did not witness any violence before the onset of the first phase of the conflict; during the first phase of the conflict; or during the second phase of the conflict, are defined as conflict-free districts. Any district that witnessed violence prior to 2007 is omitted from the analysis. Since the omitted districts are not randomly selected, it is possible that this could have led to the issue of selection bias. However, the occurrence of conflict in each district being mapped to the geographical distance of each district to the militant's headquarters minimized the bias. Table 2 shows the district-number distribution of the individuals applying for the admissions test of the IBA.

Table 2 shows that in the 2014 admissions cycle, individuals applying from 14 districts of Pakistan had witnessed violence during the first phase of the conflict and individuals applying from 14 districts of Pakistan had witnessed violence during the second phase of the violence. Similarly, in the 2015 admissions cycle, individuals applying from 14 districts of

Table 2

Distribution by districts of individuals applying for admissions

Admissions Year	2014		2015		2016	
Definition of Conflict	CON0711	CON1215	CON0711	CON1215	CON0711	CON1215
Total Districts	98	98	100	100	104	104
Conflict Districts	14	14	14	8	14	6
Conflict-Free Districts	19	19	17	17	14	14

Pakistan had witnessed violence during the first phase of the conflict and individuals applying from 8 districts of Pakistan had witnessed violence during the second stage of the violence. Finally, in the 2016 admissions cycle, individuals applying from 14 districts of Pakistan had witnessed violence during the first phase of the conflict and individuals applying from 6 districts of Pakistan had witnessed violence during the second stage of the violence.

Data on Distances of Each District from the Militant's Headquarters

Since conflict in Pakistan stemmed from the stronghold of militants located in Wana during the first phase of the conflict and in Quetta during the second phase of the conflict, in line with the literature (e.g., Leon, 2012), we instrument the occurrence of violence witnessed in each district to the distance of each district from respective militant's headquarters.

The distance of each district from the militant's headquarters is calculated using Google Maps (Dodsworth, 2012). Since the militants' base of operation and training camps in the first phase of the conflict were situated in South Waziristan, we calculate the distance of each district from its capital to the militant's headquarters in Wana, South Waziristan. After 2011, violence during the second phase of the conflict was planned and organized by the militants from Quetta, therefore, we calculate the distance of each district, from its capital to the militant's headquarters in Quetta. We postulate that the larger the distance between a district and the militant's headquarters, the lower the probability of the district to having witnessed violence.

Econometric model

To estimate the impact of the conflict witnessed in Pakistan on university level outcomes, the methodology applied is a pooled OLS estimation. The instrumental variable for the occurrence of conflict in a district is the distance of each district to the militant's headquarters in each stage of the conflict. The two-stage model can be written as below:

$$Conflict_d = \beta_0 + \beta_1 Distance_d + \gamma_t + X' + \varepsilon_{i,d,t}$$

$$Outcome_{i,d,t} = \delta_0 + \delta_1 Conflict_d + \gamma_t + X' + \varepsilon_{i,d,t}$$

where $Outcome_{i,d,t}$ is the response measure of the outcome variable, representing three different outcomes of student *i* belonging to district *d* in academic year *t*. The first outcome variable is choice of degree at the university level, which is a binary variable equal to 1 if student *i* applied to a MATHPREREQ degree and equals 0 if student *i* applied to a NONMATHPREREQ degree. The second outcome variable is a binary variable equal to 1 if student *i* successfully passed the admissions test and equal to 0 if student *i* did not successfully pass the admissions test. The third outcome variable is a continuous variable that measures the performance of student *i* in the math component of the admissions test.

$Conflict_d$ is a binary variable with two definitions. For the first definition of $Conflict_d$, i.e., CON0711, the binary variable equals 1 if district *d* witnessed violence only during the first phase of the conflict but did not witness violence before the onset of the first phase of the conflict or after the end of the first phase of the conflict. The binary variable equals 0 if district *d* did not witness violence before the onset of the first phase of the conflict; or during the first phase of the conflict; or after the end of the first phase of the conflict in any of the years from the onset of the conflict in 2007 till the year of the entrance exam. For the second definition of $Conflict_d$, i.e., CON1215, the binary variable equals 1 if district *d* witnessed violence only during the second phase of the conflict but did not witness violence before the onset of the second phase of the conflict. The binary variable equals 0 if district *d* did not witness violence before the onset of the second phase of the conflict, or during the second phase of the conflict.

$Distance_d$, is the instrumental variable for $Conflict_d$, which measures the travelling distance of each district *d* from its capital to the militant's headquarters. For the first phase of the conflict, the distance of each district is calculated from the militant's headquarters in South Waziristan, whereas for the second phase of the conflict, the distance of each district is calculated from the militant's headquarters in Quetta.

Year fixed effects γ are included in the estimation models to account for the variation in student supply in each year. The set of control variables $X'_{i,d,t}$ are also included which consist of (i) age and gender of student *i* to account for variations in educational development based on individual characteristics*; (*ii) population density of district *d* to capture inter-district differences in terms of development; (iii) a binary variable which equals 0 if a student studied in a local education setup and equals 1 if a student studied in an international school setup; and

(iv) the test score of a student in the entrance exam to account for the possibility that the student may choose their degree choice based on the anticipation of the potential outcome of the entrance test. Finally, $\varepsilon_{i,d,t}$ is the error term.

Results

Results are provided for the first phase of the conflict between 2007 and 2011 in Table 3. They estimate how exposure to conflict witnessed in the first phase of the conflict impacted university level outcomes. Results for degree choice are reported in column (1), whilst results for the outcome of passing or failing the entrance exam are reported in column (2) and results for performance in the math section of the admissions test are reported in column (3). Violence witnessed in the first phase of the conflict is the independent variable of interest, defined as the occurrence of civilian casualties witnessed in a district during the first phase of the conflict (CON0711). CON0711 is instrumented by the distance between each district to the militant's headquarters in South Waziristan. The correlation between the instrument (Distance to South Waziristan) and the variable of interest (CON0711) is statistically significant at the 10 percent level for choice of degree at the university level and statistically significant at the 5 percent level for the admissions test outcome and math score.

Table 3

Impact of violence witnessed in the first phase of the conflict on university level outcomes

	Degree Choice	Test Pass	Math Score
	(1)	(2)	(3)
FIRST STAGE:			
Distance to South Waziristan	-0.0005*	-0.0005**	-0.0005**
	(0.0003)	(0.0002)	(0.0002)
SECOND STAGE:			
CON0711	-0.4871*	0.1937	0.2357
	(0.2866)	(0.1551)	(0.4626)
CONTROLS	YES	YES	YES
CLUSTER	34 districts	34 districts	34 districts
OBSERVATIONS	288	294	288

*** Significant at 1% level, ** significant at 5% level, * significant at 10% level.

The negative coefficient of CON0711 in the second stage in Column (1) is significant at the 10 percent level, suggesting weak causal evidence for conflict impacting the choice of degree at the university level of students belonging to the conflict-affected districts. This means, in comparison to students who lived in districts not affected by conflict, students living in districts exposed to violence during the first phase of the conflict were 48.7 percent less likely to apply to a degree that required math as a prerequisite relative to a degree that did not require math as a pre-requite. The results reported in column (2) and column (3) are statistically insignificant, making it inconclusive whether conflict influenced the student passing the admissions test or the student's performance in the math component of the admissions test.

Table 4 provides results for the impact of the second phase of the conflict post-2011 (CON1215). They estimate how exposure to conflict witnessed in the second phase of the conflict impacted university level outcomes. The negative correlation between the instrumental variable and the outcome variable in the first stage is statistically significant for all outcome variables.

The coefficient of CON1215 in column (1) of Table 4 is negative and statistically significant at the 5 percent level. This implies that in comparison to students who lived in districts not affected by conflict, students who lived in districts exposed to violence were 11.9 percent less likely to apply to a degree that required math as a prerequisite relative to a degree that did not require math as a prerequisite.

Columns (2) and (3) in Table 4 also highlight a negative impact of CON1215 on the admissions test outcome and the score on the math component of the admission test. The results are statistically significant at the 10 percent level. This means, in comparison to students who lived in districts not affected by conflict, students living in districts exposed to violence were 9 percent less likely to pass the admissions test and scored 51 percent points less in the math component of the admissions test.

In summary, results for the first phase of the conflict (Table 2) and the second phase of the conflict (Table 3) provide robust evidence that students belonging to conflict-affected districts were less likely to apply to a degree that required math as a prerequisite relative to a degree that did not require math as a prerequisite, compared to students belonging to districts that did not witness conflict. However, the significant effect of conflict on performance in the admissions test disappears when students had conflict-free years before the admissions test.

Table 4

Impact of violence witnessed in the second phase of the conflict on university level outcomes

	Degree Choice	Test Pass	Math Score
	(1)	(2)	(3)
FIRST STAGE:			
Distance to Quetta	-0.0015***	-0.0015***	-0.0015***
	(0.0004)	(0.0004)	(0.0004)
SECOND STAGE:			
CON1215	-0.1188**	-0.0895*	-0.5064*
	(0.0578)	(0.0509)	(0.2891)
CONTROLS	YES	YES	YES
CLUSTER	35 districts	35 districts	35 districts
OBSERVATIONS	311	327	311

*** Significant at 1% level, ** significant at 5% level, * significant at 10% level.

In principle, the probability of passing the admissions test should be independent of a student's degree choice at the university level unless conflict affects both choice of degree at the university level and the outcome of the test through the same mechanism. To test whether a student who belonged to a conflict-affected district and had chosen a degree that required math as a prerequisite would perform differently on the entrance exam compared to their counterparts, an interaction term is added in the estimation. The interaction term consists of a binary variable for witnessing conflict and a binary variable for the choice of degree at the university level. The binary variable for witnessing conflict is the same as used earlier in the estimation, i.e., one binary variable for CON0711 and the other for CON1215. The results for the estimation are presented in Table 5.

The variable of interest in column (1) is the interaction term in the second stage of the estimation between the conflict dummy and the choice of degree at the university level. The interaction term is statistically insignificant. This means, students who living in conflict-affected districts and who chose a degree that required math as a prerequisite had an indifferent probability to pass the admissions test compared to their counterparts. This implies that the causal mechanism of how conflict affects choice of degree at the university level and the performance on the admissions test is different. The results are consistent for CON1215 as shown in column (2).

Table 5

Impact of conflict using an interaction term

	CON0711- From South Waziristan (1)	CON1215 - From Quetta (2)
FIRST STAGE:		
Distance to militant's headquarters	-0.0002**	-0.0002**
	(0.0001)	(0.0001)
Distance to militant's headquarters * choice of degree at the university level	0.0002	0.0003*
	(0.0002)	(0.0002)
SECOND STAGE:		
Conflict dummy	0.1543	-0.1220**
	(0.1494)	(0.0594)
Conflict dummy * choice of degree at the university level	0.2254	0.2794
	(0.2373)	(0.2511)
CONTROLS	YES	YES
CLUSTER	34 districts	35 districts
OBSERVATIONS	294	327

*** Significant at 1% level, ** significant at 5% level, * significant at 10% level.

Conclusion

Conflict has adverse effects on an individual's wealth, health, and education. Conflicts cost 13 percent of the world's annual GDP (World Economic Forum, 2018). The effects of conflict are especially catastrophic for children as disturbances in daily routines, home environment, or school disruptions severely impact their prospects of quality education. Globally, one-third of children who do not attend school live in conflict-affected areas (Thompson, 2018).

Using cross-sectional data obtained from the Institute of Business Administration, Karachi (Pakistan), a causal relationship between witnessing conflict and a student's educational outcome is established. The results suggest that in comparison to students who

lived in districts not affected by conflict, students living in districts exposed to violence are less likely to apply to a degree requiring prerequisite math relative to a degree without a math requirement. The finding is consistent for two separate definitions of conflict: violence witnessed in Pakistan during the first phase of the conflict and violence witnessed in Pakistan during the second phase of the conflict.

For admissions test outcomes, results show that students living in districts exposed to the second phase of the conflict were less likely to pass the admissions test and also scored less in the math component of the admissions test, in comparison to students who lived in districts not affected by conflict. However, this same relationship is not statistically significant for the first phase of the conflict. On one hand, the impact of conflict on the choice of degree at the university level is persistent over time across the two phases of the conflict whereas the impact is not persistent for admissions test outcomes. On the other hand, it is found that the probability of passing the admissions test is not correlated with the choice of degree at the university level and conflict.

One possible explanation for the differential in outcomes could be the psychological effect of conflict that may impact choice of degree at the university level and performance in the admissions test in separate ways. Accumulating evidence indicates that exposure to violent traumatic events, such as terrorism, random school shootings, and community level violence can lead to depression, aggressive behavior, anxiety, stress and emotional problems, which in turn can result in impaired cognitive development and loss in academic achievement (Currie et. al, 2001; Gershenson et. al, 2015). A potential direction for future research could be to disentangle the mechanisms behind the psychological effects of conflict on choice of degree at the university level and performance in admissions tests to quantify their impacts.

The analysis presented in this paper extends the current discussion on the effects of exposure to violence on human capital accumulation in several key aspects. First, the results provide evidence that exposure to conflict is not only linked to negative consequences on school participation and performance but also impacts the choice of subjects studied. This could further affect labor market outcomes due to the link between choice of subjects studied at the university level and the labor market, which implies that conflict not only impacts human capital accumulation but also the probability of employment and job earnings. Second, by having an effect on degree choice, career, and earning potential, conflict may also pose an inter-generational effect on individuals affected by conflict. This means that by possibly altering the choice of degree at the university level, and its consequences on the labor market, conflict can also have an impact on the schooling attainment of the next generation of

individuals whose parents may have been affected by conflict. Third, while conflict has an effect on choice of degree at the university level, these effects can be heterogeneous across gender, and potentially other demographics and socio-economic cohorts, if tested. Future research should focus on how conflict may have affected the choice of degree at the university level for different cohorts, and the mechanisms behind the heterogeneous effects. This may offer greater insight into the possible interventions required to further reduce barriers to schooling in countries exposed to violence. Fourth, the results suggest that any sort of intervention required to deal with the effects of conflict on human capital accumulation requires a holistic approach, without which any sort of intervention to assist students exposed to violence would not be successful, if indeed possible.

There are limitations in this study. First, the dataset used in this study is from one university in Pakistan. Although the university represents the general university set up of Pakistan in terms of student demographics, intakes, etc., the data examined from multiple universities across Pakistan may provide an even more robust estimation. Second, although the casual relationship between exposure to conflict and the choice of degree at the university level is uniquely identified, the impact of conflict on labor market outcomes cannot be quantitatively estimated. The existing literature highlights the association between conflict and labor market outcomes (Iannelli et al., 2016) which are not able to be tested in this study. Future research should pay particular attention to the effect of conflict on labor market outcomes through the mechanism of altering the choice of degree at the university level, and the disproportionate effect it would have on different employment sectors. Fourth, as the literature quantifying the magnitude of the mechanisms related to the impact of conflict on the choice of degree at the university level is very limited, the results of this paper pave the way for potential future research to focus on the mechanism behind the effects. This would be particularly interesting from a policymaking point of view as it would identify specific interventions that may be required to assist individuals exposed to violence.

In summary, this study concludes that conflict has an impact on the choice of degree at the university level which can further affect an individual's outcomes in the labor market and career-building decisions. This effect may also prevent students from applying to university degrees in the first place if they anticipate that they would not pass the admissions test. Policy makers, including those at universities, could consider introducing incentives to accommodate students adversely affected by conflict.

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