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Education: A More Powerful Weapon Than War?

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Abstract

In this paper, I analyze the impact of education on civil war onset, utilizing variables measuring length of compulsory education and number of internal armed conflicts in a given country per year. Using data from the Quality of Government Institute's Quality of Government Standard Time Series data set, I test this hypothesis and find that an increase in compulsory education length decreases the expected number of internal armed conflicts. The results suggest further importance of education as a great equalizer among individuals as well as nations.

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## I.	Introduction

Scholars are increasingly interested in understanding the causes of civil war due to their inherent devastating social and economic consequences. If there exists a negative relationship between compulsory education and onset of civil conflict, this would send a strong signal to governments about their policies and the value of education. Education is highly valued at a community level, yet often neglected in governmental policy despite being an important indicator of the economic development of a nation.

Certainly the United States has been criticized for spending a small percentage of its annual budget on education, but many countries do not even provide free compulsory education to their populations. This has been a substantial concern to the United Nations, which set education as one of the Millennium Development Goals, stating that it wished to ensure that by 2015 children were able to complete a full course of primary schooling[1]. As of 2015, primary education in developing regions has reached 91%, but there are still gains to be made in primary as well as secondary education, where only 66% of secondary school-aged children are enrolled[2].

Nelson Mandela was once quoted as saying, "education is the most powerful weapon in which you can use to change the world"[3]. These words may be even truer than the former South African President had intended when he spoke at the University of the Witwatersrand in 2003. Education is an undeniably important factor for increasing the output and developmental capacities of a nation, but if it were also shown to have a

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[1] "United Nations Millennium Development Goals." *UN*. UN, n.d. Web.
[2] "School Enrollment Index, Secondary (% Net)." *The World Bank Database*. UNESCO Institute for Statistics, n.d. Web.
[3] Nelson Mandela. July 2003. *Address delivered at launch of Mindset Network.* Planetarium, University of the Witwatersrand, Johannesburg, South Africa.

negative impact on the onset of armed conflict, it would bring further weight to the discussion and give additional incentives for nations to expand their educational policies. It could also partially explain a decrease in the number of new armed conflicts over the past few decades as universal education has become an important topic in the international community and therefore increased among nations. Lastly, the findings of this paper could serve to warn the international community that states with largely uneducated populations may become potential hotspots for armed conflict.

This paper seeks to explore whether an increase in the length of compulsory education decreases the number of internal armed conflicts that a country is likely to experience in a given year. In the next section, I will discuss the relationship between education and conflict. In section III, I will use a Poisson regression to analyze this question in the context of internal armed conflicts per year. In section IV, I will discuss the data collected to test my hypothesis, and in section V I will use that data to test my hypothesis and find evidence that an increase in the length of compulsory education negatively impacts the number of internal armed conflicts in a country per year. After completing a robustness check, I will conclude that there is a significant negative relationship between compulsory education length and number of internal armed conflicts.

I. The Dynamics of Education and Conflict

The interaction between education and conflict has attracted interest from scholars for many decades. Much of this attention has focused on the damaging effects of participation in violent conflict on education and educational outcomes (Benshalah et. al

2000, Lai and Thyne 2007, Chamarbagwala and Moran 2011). Scholars have found violent conflict to cause a drop in school enrollment rates, largely due to inaccessibility of resources or fear of attack. Children that have been exposed to armed conflict are less likely to continue their education after the conflict is over, are less able to overcome social obstacles, and more likely to live in poverty. It is no secret that armed conflict has a negative effect on many facets of the societies it permeates and those detrimental effects on the educational system are well documented. However, it was not until more recently that research shifted to focusing on the effects of education on conflict.

Why would education influence conflict? There are many theories as to the nature of this relationship, but one of the most widely accepted has been documented by Clayton Thyne (2006). In his research, he reasons that education allows individuals to develop skills needed for the workplace. With more education leading to more skilled workers, the host economy in question experiences growth. While this growth may not necessarily be sustainable in the long run, it does lead nations to become wealthier and build stronger economies. This, in turn, reduces the probability of conflict onset, since richer nations are less likely to engage in civil war. This theory is indirectly backed by Thyne's data; testing primary and secondary male enrollment and education expenditures, he finds that there is a significant impact of education on decreasing the probability of conflict onset. Barakat and Urdal (2009) test male secondary school enrollment on low intensity conflict outbreak and find similar results; education lowers the risk of conflict onset.

Other research has exposed an inequality argument as a major influence of education on conflict. Much the explanation has been based upon an inequitable quality of education, rather than the quantity of education received. Bush and Saltarelli (2000)

found that discriminatory curricula significantly contributed to violence. This is due to unequal opportunities for students, which create grievances as groups experience relative deprivation when seeing the opportunities available to students attending the higher quality schools. These grievances then lead to a greater likelihood of conflict onset. This theory can also be applied to the amount of schooling a student is able to receive. Barriers such as cost, distance, and a need to participate in the workforce, often dictated by socioeconomic status, may also heighten grievances among the disenfranchised group and lead to a greater likelihood of conflict.

Furthermore, as suggested by Barakat, education is generally expected to increase the opportunity cost of joining rebel forces. These opportunity costs might not decrease grievances, but they do impact ones decision to forgo a generally greater earning opportunity to engage in conflict. Collier and Hoeffler (2004) infer that rebellion is less likely and rebel recruitment more costly in more highly educated societies. Edgar and Ray (2008) find that when groups have a near-zero opportunity cost, the political system within that country will almost certainly be challenged. This would also explain the increase in conflict onset probability in societies with youth bulges, which have been found to frequently suffer from employment shortages (Moller 1968, Huntington 1996, Cincotta et al. 2003).

As discussed above, there exists substantial literature detailing the relationship between education and conflict. Yet while increased education is generally accepted to be a positive factor mediating conflict onset, this information does little to impact policies. Identifying more specifically what forms of education and under what conditions reform is successful in mediating conflict may help to instruct states how best to improve their

educational systems, rather than imply a trial and error approach within a certain field. Most of the previous literature utilizes enrollment statistics as a method to examine the relationship between education and civil conflict, which provide little clarity regarding how best to increase education access and quality through governmental policies. Furthermore, many of these studies look solely at male enrollment, believing that men are more likely to join rebel forces than women. While looking at enrollment percentages at various levels is a strong predictor of a general impact of male education, it does not strongly suggest concrete policy implications without risk of major gender discrimination. Additionally, the usage of enrollment statistics might be skewed by socioeconomic status, which would not adequately describe the impact that education has on conflict, but a mix of education and wealth. Østby and Urdal (2010) recommend an implementation of policies that reduce educational inequality. However, Østby and Urdal do not test nor advocate for any specific measures to diminish this inequality, again providing little direction for those who wish to implement programs on how to go about doing so.

      The findings of the length of compulsory education for both genders on number of conflicts in a given year, if statistically significant and negative, could suggest a direct policy option: increasing (or implementing) compulsory education laws. While similar to enrollment percentages, it tests the policy operative and includes policies which may not be strongly enforced. Furthermore, other scholars have not significantly explained the impacts of length of compulsory education on conflict onset. The results of this paper thus attempt to fill this gap in the literature and recommend a specific policy option to

institutions if compulsory education length is discovered to have a pacifying effect on number of conflicts in a country during a given year.

II.   Explanation and Hypothesis

When tested, the model constructed in this section attempts to demonstrate a significant negative relationship between the number of years of compulsory education within a country and the number of internal armed conflicts per year in that country during that year. The hypothesis can be stated as follows:

$H_A: \beta_1 < 0$

An increase in the length of compulsory education decreases the number of internal armed conflicts that a country is likely to experience in a given year.

It would be rational for education to have a pacifying effect on armed conflict for four reasons. First, a focus on education, even if not a monetary commitment, sends a signal from the government to the public that the state is interested in improving their lives. This, in turn, would lower grievances, resulting in a lower probability of conflict emerging and likely increasing the probability of populations to act on grievances using non-violent methods. Second, education may allow for groups to develop important skills that help to settle disputes in a peaceful manner, which would again reduce the probability that grievances would lead to conflict. Third, education's role as a 'great equalizer' allows individuals to overcome obstacles faced by socioeconomic status or other identities that do not allow them as much opportunity as others in society. Increasing the number of years of mandatory education would then decrease the gap

between educated and uneducated. This would then diminish potential grievances resulting from societal inequality, and decrease the probability of armed conflict arising. Lastly, education allows for greater opportunity, higher wages, and positive social mobilization, which may increase the opportunity costs of engaging in political violence or being recruited by rebel organizations.

Due to the fact that the dependent variable is a count variable, the OLS regression is not appropriate estimator of the model, as the error term would have to include a conditional Bernoulli distribution. Therefore, to test this hypothesis, I will use a Poisson regression with the vce(robust) option to control for mild violation of underlying assumptions in the event that heteroskedasticity is present in the simple model. I will test the effect of education length on the number of internal armed conflicts, controlling for other outside influences. The constructed model is as follows:

$$CONFLICT = \beta_0 + \beta_1\ EDUCATION\ LENGTH + \beta_2\ REGIME\ TYPE + \beta_3\ REAL\ GDP +$$
$$\beta_4 ETHNIC\ FRACTIONALIZATION\ + \beta_5 RELIGIOUS\ FRACTIONALIZATION +$$
$$\beta_6\ GOVERNMENT\ CONSUMPTION\ + \mu$$

where;

- o CONFLICT represents the number of internal armed conflicts within a country during a given year;

- o β_j are the estimated parameters;

- o EDUCATION LENGTH is the number of years of compulsory education within a state;

- o REGIME TYPE is a polity scale ranging from strongly democratic to strongly autocratic;

- o REAL GDP represents real gross domestic product in constant prices

- o ETHNIC FRACTIONALIZATION is the probability that two randomly selected people from a given country will not belong to the same linguistic group;

- o RELIGIOUS FRACTIONALIZATION is the probability that two randomly selected people from a given country will not belong to the same religious group;

- o GOVERNMENT CONSUMPTION represents the share of government consumption at current purchasing power parities;

- o μ is the error term.

Further information on the sources, time frames, and assumptions of the independent and dependent variables can be found in the following section.

III.   Data

The data used in this study come from the Quality of Government Institute's Quality of Government Standard Time Series data set (QoG). The unit of analysis in this data set is country-year (e.g. United States-2014, United States-2015) and data is compiled between 1946 and 2014. The QoG draws from a number of available data sources to create a comprehensive source with over 2,000 variables and is broken into the following categories: quality of government, public economy, private economy, education, health, welfare, judicial, political system, elections, environment, energy and infrastructure, conflict, media, and migration.

The dependent variable employed in this paper is the number of internal armed conflicts. The data was prepared by the Uppsala Conflict Data Program (UCDP) and the

International Peace Research Institute, Oslo (PRIO). Internal armed conflict is defined as conflict that "occurs between the government of a state and one or more internal opposition groups without intervention from other states"[4]. The data set records the number of internal armed conflicts per country in a given year. There is no distinction between colonial and imperial wars. The data set spans between 1946 and 2013, documenting 164 countries and 2379 observations. The dependent variable does not take into account interstate armed conflicts, due to more complexities with different actors and educational levels of the other countries which could confuse the results of the coefficient and its meaning.

The independent explanatory variable in this study is the duration of compulsory education, measured in years. The data comes from the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The data set spans between 1998 and 2013, representing 183 countries and 2576. Compulsory education is defined as a period of time in which peoples of a certain age are required to receive education and is mandated by law.

Five control variables are utilized in the model: regime type, real GDP, ethnic fractionalization, religious fractionalization, and government consumption. Regime type represents a polity score; it is used for measuring the polity of the regime between strongly democratic, +10, and strongly autocratic, -10, governments. The data set was compiled by the Polity IV Project and looked at regime characteristics between 1800-2013. The variable spans from 1946-2012, represents 182 countries and 8826

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[4] Teorell, Jan, Stefan Dahlberg, Soren Holmber, Bo Rothstein, Felix Hartmann &Richard Svensson. 2015. The Quality of Government Standard Dataset, version Jan15. University of Gothenburg: The Quality of Government Institute.

observations. The use of regime type as a control variable separates education length from regime type, since highly democratic nations are believed to experience less civil wars as people have non-violent means to addressing grievances. Research by Esteban and Rey (2008) support this relationship; finding that incidence of conflict depends critically on the ruling political system and their guarantee of peace.

Real GDP represents a nation's gross domestic product at constant 2005 national prices in millions of 2005 US dollars. The data, compiled by Penn World Table, includes years 1950-2011 and has 7541 observations in 169 countries. It is used to control for the wealth of a nation, since it has been demonstrated that wealthier nations are less likely to engage in internal armed conflict, regardless of other factors.

Ethnic fractionalization is the probability that two randomly selected people from a given country will not belong to the same ethnic group. The higher the probability, the more fractionalized the society. The data was compiled by Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg as a measure of fractionalization. The data spans from 1946-2012, with 189 countries and 9476 observations. The model controls for ethnic fractionalization because many scholars, including Horowitz (1985), have found it to be a contributing factor to conflict because ethnic groups provide an identity and allegiance in which people can rally around felt grievances. This is affirmed by the data, as the correlation coefficient between number of conflicts and ethnic fractionalization is significant and positive at 0.14034.

Religious fractionalization reflects different religious groups within a given country. The higher the probability, the more fractionalized the country. The data includes 191 nations and 9533 observations, spanning from 1946-2012. It was created by

Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg. While the relationship between religious fractionalization and conflict is highly contested, some scholars have found it to decrease the probability of conflict onset due to a cohesion factor unseen by ethnic measures. It is negatively correlated with number of conflicts, with a coefficient of -0.2114 and a p-value of 0.00, affirming the perceived relationship. Thus, the model preemptively controls for religious fractionalization.

Government consumption is defined as the "share of output-based real gross domestic product per capita that is represented by government consumption, at current purchasing power parities"[5]. The data includes 7540 observations from 169 countries between 1950 and 2011 and was assembled by Penn World Table. Generally, nations with higher government consumption levels are wealthier, reducing the probability that conflicts will occur within the nation. Similarly, higher levels of government consumption may signal to the population that the government is interested in the wellbeing of its citizens, thereby reducing the probability that grievances will turn violent. This is supported by the negative correlation coefficient, -.0343, between the two variables.

IV.   Findings

Table 1 displays the empirical tests of the hypothesis. The first column demonstrates the results of the model constructed in this paper; that is, the effect of an increase in the length of compulsory education on the number of internal armed conflicts

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[5] Government Consumption. 2015. Penn World Tables Dataset, version 8.0. Groningen Growth Development Centre, University of Groningen and the University of California, Davis.

in a country during a given year. Due to the nature of this test, it is not possible to predict

a value increase or decrease in number of conflicts given an additional year of

compulsory schooling. However, looking at my model, I find strong support for a

negative relationship between the length of compulsory education and the number of

internal armed conflicts, with a coefficient of -.217 and a p-value of 0.00.

Other variables in the model that are similarly strong and significant are ethnic

fractionalization, religious fractionalization, and real GDP. All three variables have p-

values less than 0.001. Ethnic fractionalization and religious fractionalization both take

on their predicted signs; that is, the model demonstrates a positive relationship with

ethnic fractionalization (β_4 =1.841013) and a negative relationship with religious

fractionalization (β_5 = -2.525794). Real GDP demonstrates a positive relationship, which

is the opposite of what previous research and explanations have suggested. However,

with a beta of 0.000000215, the coefficient may be too small to be definitively positively

related to conflict. Regime type, significant at the 5% level, also takes on an unexpected

value, with a positive coefficient. Furthermore, the coefficient for government

consumption fails to attain significance in the model.

The second model is used as a robustness check for the first. It tests whether the

length of compulsory education affects the presence of internal armed conflict. Because

the presence of conflict is measured as a dummy variable (0 for no conflict, 1 for

conflict), model 2 uses the xtlogit command. Thus, the findings of model 2 are unable to

be directly compared to those of model 1. However, the findings of the relationship

between education and conflict in model 2 agree with those of model 1, giving further

credibility to the results of model 1. β_1, the coefficient of the length of compulsory

education, is negative and significant, at -.21000896 and with a p-value of 0.034. Furthermore, all coefficients in model 2 displayed their predicted signs, with real GDP and regime type showing negative coefficients, unlike in the first model. However, it is worth stating that regime type was not significant at the 5% level.

Noting my findings from model 1 and their agreement with the findings from model 2, I conclude that there is a significant negative relationship between length of compulsory education and the number of internal armed conflict within a given country per year. That is, I determine that education does indeed have a diminishing influence on the number of expected internal armed conflicts per year.

V.   Discussion

Education has been touted as a great equalizer, and it may even diminish opportunity gaps outside of nations. The findings of this study suggest that by enacting longer compulsory education, states decrease the number of internal armed conflicts they are likely to experience per annum. The devastating effects of civil war are well known. Nations suffer from both a loss of physical and human capital, and economic growth is largely halted. Thus, conflict-ridden countries fall behind their less conflict-prone counterparts, increasing inequality among global actors.

The findings from this paper suggest that increased education, seen through the length of compulsory education, lessens the likelihood that that a country will engage in civil war, which may help to close this global gap. These results are both good news as well as troubling: they add another dimension to the importance of education and give further incentives for nations to enact pro-education policies, yet also highlight the

cyclical dilemma into which nations enter once they experience armed conflict. If low quality or inaccessible education has a positive relationship with conflict onset, countries that engage in conflict are at risk of repeating the cycle, as education access and quality are often decreased after conflict occurs and countries with less education are more likely to engage in civil war. While this may help to explain why conflict-prone countries are disposed to to relapses, it does not help to mitigate this issue.

However, it is worth noting that while the results from this paper indicate an explanation of this problem, further research would be needed to definitively conclude that the education-conflict cycle occurs. Additional research may also be necessary to further define the impact of education on conflict for different groups. This paper looks at compulsory education mandates for both genders and highlights the need for universal compulsory education and the enforcement of those mandates. Building on these results, testing an increase in compulsory education of males versus females, minority versus majority groups, or remote versus city populations on conflict onset may help nations further understand and identify which populations are particularly at risk of engaging in conflict.

Nevertheless, the results of this paper definitively suggest that there are incentives for countries to increase their compulsory education laws. Education has many benefits, both for individuals and the societies in which they live. A reduction in the number of conflicts a country is likely to experience is just another gain added to this list. Nelson Mandela may have understood the value of education as a weapon, but likely did not realize the impact it has on influencing whether or not groups pick their weapons up.

VI. Appendix

Table 1: Effects of length of compulsory education on internal armed conflicts

Variable	(1) poisson Number of internal armed conflicts	(2) xtlogit Presence of internal armed conflict
Length of Compulsory Education	-.2165312 *** (.032859)	-.2100896* (.0991222)
Regime Type	.0210302* (.0125769)	-.0616384* (.0304693)
Real GDP	.000000215*** (.0000000325)	-.000000206 (.000000142)
Ethnic Fractionalization	1.841013*** (.237596)	2.620486** (.8907308)
Religious Fractionalization	-2.525794*** (.229683)	-2.361634) (.9501577)
Government Consumption	.1957575 (.3720724)	-.0965345 (1.1611)
N	657	1865
Pseudo R^2	0.1403	
Wald $chi^2(6)$		37.39
Prob > Chi^2	0.000	0.000
Log likelihood	-533.54921	-725.82187
Likelihood-ratio test of rho=0		303.25

*p<.05; **p<.01; ***p<.001

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