Insurgent_Learning_Capstone

[redacted]

16 July 2019

Executive Summary

It is evident from the analysis that the Taliban are learning and adapting to the IED neutralization strategies employed by the counter-insurgents. Effectively, there is no long-term improvement in the clearing rate, i.e., the proportion of IEDs neutralized to total IED events.

Such a conclusion is surprising considering that the counter-insurgents have spent several billion US dollars trying to effectively neutralize IEDs planted by the Taliban. Every new neutralization approach employed by the counter-insurgents causes the clearing rate to increase in the short-term, but this effect is not sustained over time.

Background

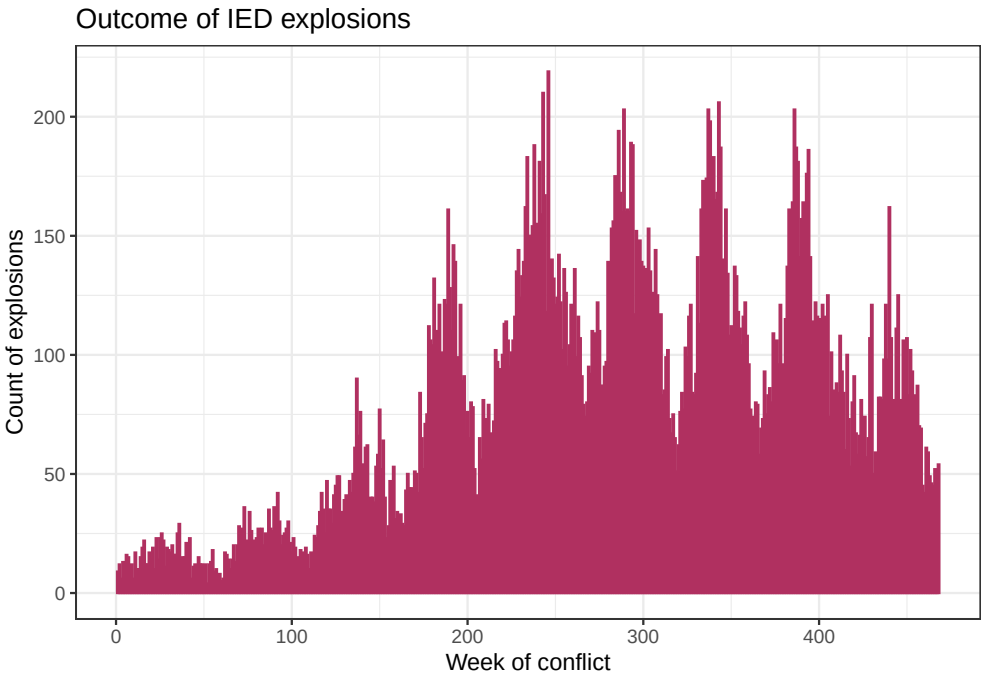
The conflict in Afghanistan began on October 7th, 2001, as wider crackdown on terrorism by the American armed forces. Since then, a coalition of 40 countries was established by the US forces to drive out the Taliban and al-Qaeda insurgents in Afghanistan. The allied forces had great success in defeating the Taliban and al-Qaeda forces in the beginning. However, the Taliban and their allied networks reorganized and engaged in a counter-insurgency from 2003 onwards. This lead the Taliban to make some gains around 2006, with violence in this conflict peaking between 2007 and 2009.

The conflict in Afghanistan has been the longest war in American history and has produced significant casualties on all sides. Tens of thousands of Afghani civilians, 62,000 Afghan national security forces and 4000 coalition forces have been killed in this conflict. According to the Department of Defense (USA), the war in Afghanistan has cost the American taxpayers over 750 billion dollars.

Analysis

The following sections shall look at the effectiveness of roadside IEDs (improvised explosive device) employed by the insurgents and the counter-insurgency response of the allied forces.(The analysis will explore if the counter-insurgents were effective in reducing the detonation rate of the IEDs over time.

The figure below is a graph that shows the number of IED explosions per week of conflict. It is evident from the graph that the explosions are cyclical, showing the existence of seasonality in the conflict. This shows that both the insurgents and the counter-insurgents are adapting to the opponent's strategies.



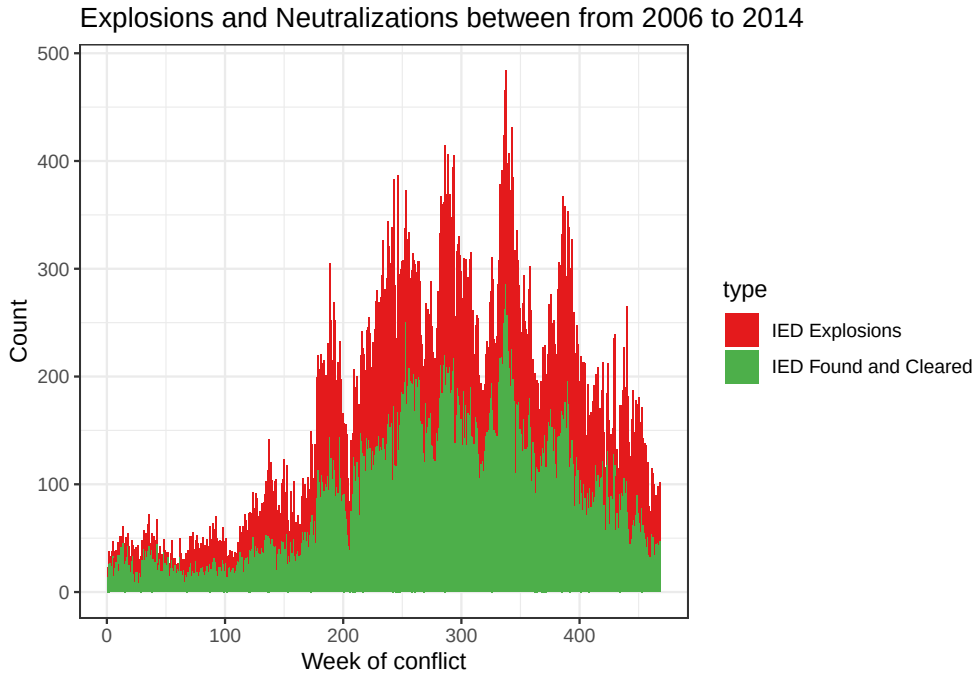
The table below shows a simple linear regression between clear rate and the week of conflict. Here, clear rate is defined as the proportion of IEDs that are neutralized to the total number of IED events. It shows that the clear rate is decreasing over time, suggesting that over time, the insurgents are better at avoiding IED neutralizations.

% Table created by stargazer v.5.2.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
% Date and time: Thu, Jul 18, 2019 - 22:06:57

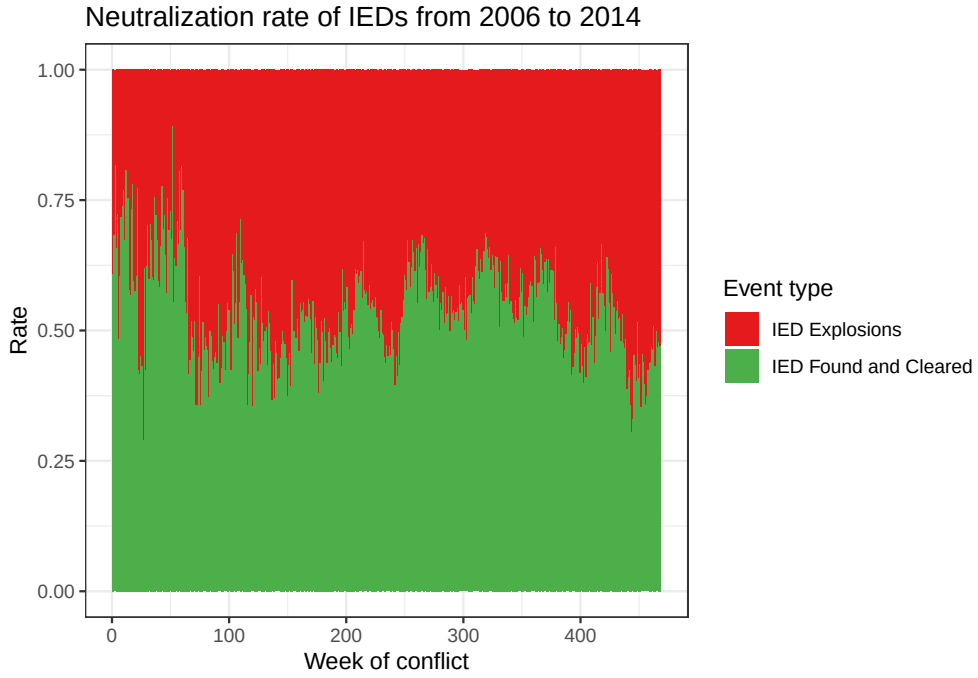
Table 1:

	Dependent variable:
	clear_rate
week_of_conflict	-0.0001^{***}
	(0.00003)
Constant	0.578^{***}
	(0.009)
Observations	468
R^2	0.046
Adjusted R^2	0.044
Residual Std. Error	0.093 (df = 466)
F Statistic	22.268^{***} (df = 1; 466)
Note:	*p<0.1; **p<0.05; ***p<0.01

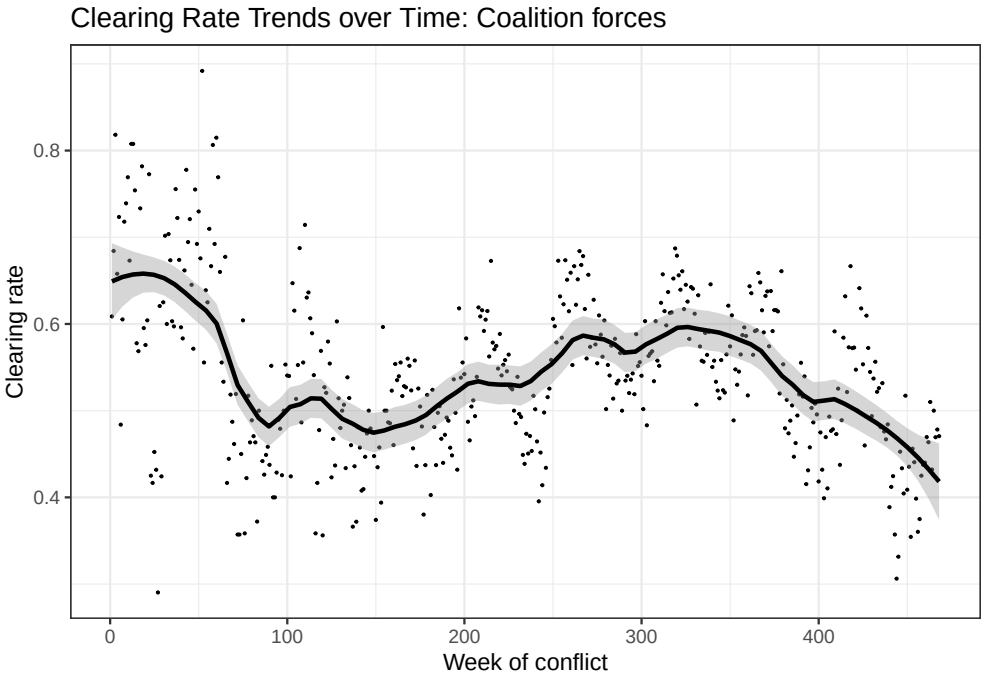
The graph below shows the number of IED explosions and IED neutralizations per week of conflict between 2006 and 2014.



The figure below shows the neutralization rate from 2006 to 2014. This shows the presence of non-linear learning among the insurgents. From the graph, we can see that at the beginning of each fighting cycle the number of IED neutralizations goes up. This leads the insurgents to innovate and learn the opponent's tactics, which in turn produces the effect of increasing the number of IED explosions. This pattern seems to be non-linear and cyclical.



The graph below shows the relationship between clear rate and week of conflict as a polynomial function. This seems to capture the cyclical nature of the clear rate far better than the linear regression. It is evident from the graph that the clear rate is cyclical and that it remains fairly constant over time. However, the clear rate seems to be trending downwards in recent years. This may be correlated with the withdrawal of some coalition forces from Afghanistan.



Conclusion

The analysis done in the previous section helps us to conclude that insurgents are learning and innovating to improve the effectiveness of IED explosions. This learning behavior on the part of the insurgents compels the counter-insurgents to increase their expenditure on technologies to neutralize the IEDs. This is done with the understanding that increased investments should reduce IED explosions.

However, the effect of increased spending on counter-insurgency is nuanced. Initially, there is an increase in the IED clearing rate, which reduces the number of IED explosions in the short term. But the insurgents adapt to the new tactics soon enough and the clearing rate seems to drop again. The overall effect seems to be that the clear rate remains constant, irrespective of the amount of money spent on IED neutralizations by the counter-insurgents.