1, The replicated graph - model dependence
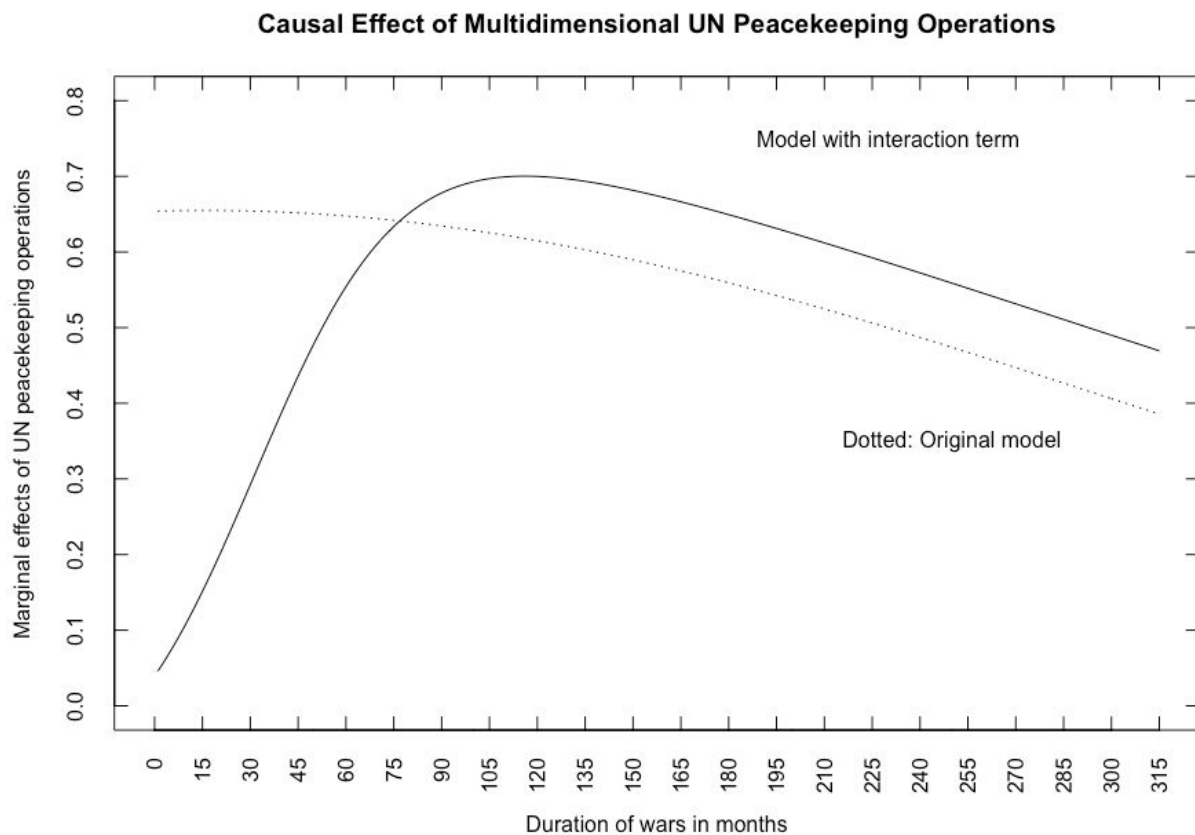
Causal Effect of Multidimensional UN Peacekeeping Operations

Figure 1. Replication of figure 8 in https://gking.harvard.edu/files/counterf.pdf

2, The treatment

In the code, we create a new vector *Tr* whose length equals the number of observations in the dataset, with all values as 0. Then, for the elements that correspond to *untype* in *foo* that is not None, they are changed into 1. Then, we replace the values in column *untype* in *foo* with *Tr*. Therefore, the treatment is *untype*. If a unit receives any intervention (treatment), its *untype* equals 1, and 0 otherwise.

3, Role-playing

      a, Causal question

What is the impact (treatment effect) of UN peacekeeping interventions on the countries' lenient peacebuilding success 2 years (*pbs2l*) and 5 years (*pbs5l*) after the war, with *untype* as the treatment and any countries that received any type of interventions (*untype* different from *None* or 0) belong to treatment group and control group otherwise?

b, SUTVA

SUTVA might be violated because the world is a complex system and the countries do interact with each other, therefore one country's treatment assignment might affect another's outcome; for example, if country A receives an intervention and has more peace, its political stability can have a positive impact on its neighboring country B, regardless of B's treatment assignment.

Theoretically, *restrict* argument in *Match()/GenMatch()* can restrict the matching possibility of certain observations that are likely to make SUTVA not hold; for example, if restrict receives a negative value, it means the two specified observations cannot be matched no matter what.

c, Matching

i, Comparisons between regression, p-score matching and genetic matching

		Treatment effect (bias adjustment)	Treatment effect (no bias adjustment)	P-value (from MatchBalance)
Logistic regression	Len success 2 years	NA	0.09302326	3.2767e-05
	Len success 5 years	NA	0.09848485	0.00010717
P-score matching	Len success 2 years	0.2355	NA	0.002
	Len success 5 years	0.19714	NA	0.084
Genetic matching	Len success 2 years	0.20518	0.19444	0.15452
	Len success 5 years	0.26405	0.21212	0.20399

ii, Decision memo

DECISION MEMO

To: Ms. Susan Allen - Alliance for Conflict Transformation

From: Trang Nguyen

Problem: How effective are UN peacekeeping operations?

Summary

This decision memo discusses how we can use scientific studies given the data to evaluate the effectiveness of certain UN peacebuilding interventions on countries at war. Conducting an observational study based on the idea of randomized control trials, with the treatment group having UN interventions and the control group not having UN interventions, we conduct different data analysis methods to obtain the effects and evaluate them. In general, Genetic matching has been proven to be more reliable than normal matching and regression because it better controls the differences between the two groups, making sure the treatment effect we get is mainly due to the treatment itself, not any other factors.

Conclusion

In conclusion, after conducting the study, the treatment effects (obtained by genetic matching) of the UN interventions on the peace building of the countries we get for 2 years and 5 years after the war are 0.2 and 0.26 respectively. This means that 2 years after the war, UN interventions increase the peace building success of those countries by 0.2%, and 5 years 0.26%. The result is plausible because there is not much initial difference between the control and treatment groups that can cause the treatment effect, indicated by the big p-values 0.15 and 0.2. Observational studies and randomized control trials are great tools to test the effect of one treatment/intervention on something, and we should utilize them wisely. In this case, applying randomized control trials method to our observational study, together with different data analysis methods, gives us a reliable result by shedding lights on the real efficacy of UN peacebuilding operations.

APPENDIX

https://github.com/trangnguyenvn1398/CS112-4thAssignment