Causal Inference for Peacekeeping Research: A Synthetic Control Approach

**The Literature on PKOs and Peacebuilding**

Overwhelmingly, two decades of research have suggested a general conflict-reducing effect of third-party peacekeeping operations (PKOs) (Fortna and Howard 2008, Dorussen 2014, Walter et al. 2021). Indeed, this relationship has been established across a wide variety of operationalizations of peace, such as the rule of law (Blair 2019), economic recovery (Bove et al. 2021), inter-ethnic trust (Mironova and Whitt 2015), battle deaths (Vivalt 2015), the risk of conflict onset (Hegre et al. 2018), the risk of conflict recurrence (Fortna 2004, Quinn et al. 2007, Collier et al. 2008, Mason et al. 2011), civilian casualties (Hultman et al. 2013), and mass killings (Melander 2009). PKOs have been theorized to promote peace through their capacities to stop ongoing violence, to prevent formerly warring parties from re-engaging in conflict, and to address structural causes of violence.

In this first aspect of peace promotion, PKOs are theorized to serve as a "buffer" between groups engaged in ongoing violence. If a physical buffer is placed between warring parties, the chances of accidental engagement between groups that might disrupt the conflict termination process decreases. For those groups that may not be committed to the conflict termination process, PKOs make the process of reneging on ceasefires much more costly as PKOs can monitor which actors are violating a ceasefire. In addition, the mere presence of a PKO serving as a buffer can eliminate tactical advantages a reneging party may have had as the element of a surprise is spoiled by PKOs who publicly report violations of ceasefires. Given that PKOs often serve as buffers, reneging parties run the risk of armed confrontation with peacekeeping forces, which itself contains international costs on reputation.

In the post-conflict environment, PKOs are thought to contribute to post-conflict peace by resolving "commitment problems". In short, the commitment problem is a dilemma scholars studying conflict have identified that makes conflict recurrence a rational path for formerly-warring actors (Fearon 1995, Hartzell et al. 2001, Powell 2006). When warring parties are ready to "come to the table" and negotiate, these parties are aware that, regardless of the settlement they reach, the other party has an incentive to renege on the settlement when it is beneficial for them to do so. Barring a third-party enforcement mechanism, formerly-warring parties may return to war either because the incentive to renege increases or, for preventative purposes, under the expectation that the other party is about to renege on the settlement. In this role, PKOs can serve as a clear third-party guarantor of a settlement to help resolve the commitment problem. Lastly, recent studies have demonstrated that PKOs can serve to resolve underlying structural forces that may promote the onset and recurrence of violence. Examples of this include studies demonstrating a positive effect of PKOs on local economic well-being (Bove et al. 2021), inter-ethnic relations (Mironova and Whitt 2015), and the promotion of representative political institutions (Joshi 2013).

However, many scholars have documented disturbing occurrences that are associated with the onset of PKOs. Indeed, a large (and growing) literature details the links between U.N. PKOs and transactional sex, sex tourism, and human trafficking (Jennings 2010, Smith and Smith 2010, Smith and de la Cuesta 2011, Beber et al. 2017, Bell et al. 2018). While sexual abuse and predation is not necessarily an indicator that a post-conflict environment will return to conflict, it is nonetheless an indicator that PKOs may contribute to post-conflict grievances. Other scholars have noted the presence of "peacekeeping economies" in which local economies experience growth *because of a PKO*, but this growth is sensitive the PKO withdrawals (Jennings and Boas 2015, Jennings 2018, Beber et al. 2019). Theoretical works such as Kuperman (2008) and Rauchhaus (2009) have considered the possibility of unintentional conflict-enhancing side effects produced by humanitarian intervention. According to Kuperman (2008), as humanitarian interventions increase globally, the incentives to rebel in at-risk countries increases. Prospective rebels understand that rebellion is often accompanied by retaliation by the state that often targets civilians. In this way, humanitarian interventions designed to protect civilians can be manipulated by prospective rebels as a tool to combat the state. This creates a moral hazard effect where humanitarian intervention allegedly encourages riskier behavior by dissidents in at-risk countries. Rauchhaus (2009) acknowledged that third party actors can identify when their services are being taken advantage of, however, they can still be limited in their capacity to reduce this unintentional conflict-increasing activity by a lack of ability or will to police and punish provocative behavior. In sum, while the empirical evidence suggests a large pacifying effect of PKOs on peace, scholars have identified many worrying aspects of PKOs for peace.

Of course, not all PKOs are the same and it may be the case that some of these negative aspects can be partially explained through other factors. For example, many scholars have argued that characteristics of PKOs themselves determine whether a PKO will be effective at promoting peace. Haas and Ansorg demonstrated that increased troop quality within PKOs is associated with a reduction in civilian victimization. Bove and Ruggeri (2016) detailed a relationship between increased U.N. PKO troop diversity and a reduction in civilian deaths. In a later study (Bove and Ruggeri 2018), the authors also found that a reduction in civilian and battle-related deaths is associated with decreased geographic and cultural distance between the PKO-targeted state and the composition of peacekeepers themselves. Hultman et al. (2014) showed that an increase in armed U.N. peacekeeping personnel correlated with a reduction in battlefield deaths and a later study found a similar pacifying effect for the risk of conflict recurrence (Hutlman et al. 2016). Kathman and Wood (2016) find similar support for the pacifying effect of the militarization of U.N. personnel in PKOs during the post-conflict period. In contrast, Phayal (2019) found that the military capacity of U.N. peacekeeping forces does not impact levels of civilian victimization. Di Salvatore (2019) demonstrated a crime-reducing effect associated with an increase in U.N. police personnel while an increase in U.N. military personnel is associated with an opposite effect. Studying violence more broadly, Bara (2020) arrived at a similar conclusion where increases in U.N. police personnel are correlated with a decrease in violence in general. Increases in U.N. military personnel were found, in contrast, to be associated with a decrease in civilian victimization when perpetrated by formerly warring parties only.

While the study of U.N. PKO composition is perhaps the most popular in the literature seeking to understand the conditional effects of PKOs on peace, other studies have examined how temporal dynamics impact the pacifying effect of PKOs. Kathman and Wood (2011) demonstrated how impartial interventions (such as U.N. PKOs) are associated with an increase in violence in the short term but decreases in the long term. Gilligan and Sergenti (2007) found that PKOs appear to only be effective in the post-conflict period. Sambanis (2008) detailed how PKOs create peace in the short-term, but long-term peace requires PKOs to focus on building institutions that can sustain the peace following eventual withdrawals of the PKO itself. Other studies have considered war-time dynamics as factors conditioning the success of PKOs. Beardsley et al. (2019) found an interactive pacifying effect of peacekeeping and mediation on battle-related deaths. Fjelde et al. (2018) outlined how PKOs appear to be more effective at reducing civilian victimization when violence against civilians is committed by rebels. In contrast, PKOs seem to be less effective at reducing government-led civilian victimization. Phayal and Prins (2019) find a similar effect when analyzing PKO effectiveness at the sub-national level.

Undoubtedly, the literature analyzing the effects of peacekeeping on peace has led to many valuable contributions. However, a massive shortcoming in the contemporary literature is the inability of most pieces to speak in terms of "effects". In reality, the majority of the peacekeeping literature is limited to discussing findings within the context of correlations and associations. However, as a literature whose intent is to offer and evaluate policy-applicable conflict resolution strategies, the focus of these efforts *should* be placed on assessing causal effects. The following section of this paper argues that making causal inferences in the peacekeeping literature should be a priority of scholars engaged in this literature. In doing so, the following section also reviews and critiques current efforts within the literature at making causal inferences, while also offering potential paths forward to improve the achievement of causal inference in this literature.

**The State of Causal Research in the PKO Literature**

While causal language in very much present in the PKO literature, causal methods are much less represented. Oftentimes, studies that do not employ a research design oriented towards making causal inferences will use causal terminology such "significantly reduce the risk of further conflict" (Collier et al. 2008, p. 473), "decreased the risk of another war" (Fortna 2004, p. 283), "sustain the peace" (Quinn et al. 2007, p. 183), and "reduces violence against noncombatants" (Hultman et al. 2013, p. 10) when referring to the alleged effects of PKOs on peace and violence. At first glance, this may seem to be simply a semantic quibble. However, we should be cautious of using causal language when using correlative methods. Kocher's (2014) critique of Hultman et al. (2013) demonstrates the need for such caution. While Hultman et al.'s (2013) work suggested a causal effect linking PKOs to the reduction of civilian casualties, Kocher's (2014) re-analysis found that such a causal interpretation was inaccurate given that one-sided violence had decreased on average prior to the onset of PKOs. Further, Kocher (2014) likewise demonstrated that much of the size of the effect between PKOs and violence against civilians was explained by the sole case of Rwanda in 1994. Instances such as this relying on statistical modeling, should warrant caution of causal interpretations of regression coefficients, which require strong assumptions, such as strict exogeneity and a lack of omitted confounding variables (Samii 2016, Keele et al. 2019), that are rarely met in the peacekeeping literature.

That is not to say, however, that causal research is *impossible* in the peacekeeping literature. In select instances, researchers have managed to execute randomized controlled trials (RCTs) where access to the treatment is randomized so that no confounding can occur and causal estimates can be made (Mironova and Whitt 2015). However, these approaches are rare. Practically speaking, researchers do not typically have a say concerning the targets of peacebuilding programs, especially when that peacebuilding program is a PKO. Further, even if researchers had such capacity, it would be unethical to randomly assign potentially life-saving peacebuilding programs to some countries while others did not receive such treatment.

In the absence of experimental data, many scholars in the field have adopted an instrumental variables approach to making causal inferences concerning the effect of PKOs (Sambanis 2008, Vivalt 2015, Ruggeri et al. 2017, Blair 2019, Bove et al. 2021). Recognizing that treatments can be explained by both aspects that are determined by variables in a model (exogenous) and aspects that are, to some extent, determined by other variables in a model (endogenous) factor, the instrumental variables approach seeks to remove aspects of the treatment that are endogenous and retain the exogenous aspects of the treatment to isolate the causal effect of the treatment. The instrumental variables approach does so by identifying a variable (an instrument) that is correlated with the treatment, is not correlated with other confounding factors, and is correlated with the outcome *only through the* treatment. If these conditions are met, it can be assumed that the instrument reflects a portion of the exogenous aspects of the treatment and is untainted by confounding factors. Predicted values are generated by regressing the treatment on the instrument and these subsequent predicted values are used to estimate the causal effect of the treatment on the outcome. While this method is appealing when there are theoretical reasons to believe that confounding variables are present that current data either does not or cannot account for, this approach has not been implemented without controversy. Gilligan and Sergenti (2007) criticized the use of instrumental variables, referring to causal estimates from such an approach as invalid. These authors argued that the literature has a good grasp on the confounders that complicate the relationship between PKOs and peace, rendering the concern of unknown confounders relatively unimportant. Further, the authors were also skeptical that an instrument for this type of research *could* exist on the grounds that "Any factor that affects how long a war or its subsequent peace will last should also be taken into account by the UN Security Council when it is deciding whether or not to allocate a mission" (Gilligan and Sergenti 2007, p. 91). Essentially, the authors argued that there are no exogenous aspects of the treatment (UN PKO) given that the authorization of PKOs are heavily influenced by endogenous factors related to conflict and peace duration. Indeed, the discovery of valid instruments are particularly difficult given the challenge of satisfying the excludability assumption in which the instrument effects the outcome solely through the treatment. For example, weather is commonly used as an instrument in conflict studies employing an instrument variables approach. However, recent work has suggested that this once-reliable instrument heavily violates the excludability assumption (Mellon 2021). Such findings present a fundamental problem with the use of instrumental variables. Instruments are as valid as our ability to argue that the instrument effects the outcome solely through the treatment, rendering the validity of these instruments incredibly sensitive.

Instead of instrumental variables, Gilligan and Sergenti (2007) suggested the adoption of matching as an approach to improve causal estimates in the peacekeeping literature. The virtues of matching, as the authors claimed, can be attributed to the relative simplicity and transparency of the technique. Units are matched to each other according to their similarity with a specific number of confounding factors. They differ, however, with respect to their treatment status. Given the similarity between matched units, the difference in outcome between matched units *may* be indicative of a causal effect of the treatment. Matches can be made transparent along with the variables on which they are matched. Indeed, given the intuitive nature of this approach, matching is widely employed in the peacekeeping literature (Sambanis 2008, Kathman and Wood 2011, Hultman et al. 2013, Hultman et al. 2014, Ruggeri et al. 2017, Di Salvatore 2018, Fjelde et al. 2018, Haas and Ansorg 2018, Beber et al. 2019, Bara 2020), albeit, not always as a method to improve causal interpretation. A significant limitation of this approach is its inability to address unspecified confounding variables. Again, units are matched to each other according to researcher-specified confounding factors. This method cannot resolve confounding effects that are not specified by the researcher meaning that the risk of omitting a potential confounder and biasing a causal estimate is still present.

Much like the use of matching, fixed effects are often employed in the peacekeeping literature (Joshi 2013, Hultman et al. 2014, Kocher 2014, Bove and Ruggeri 2016, 2018, Di Salvatore 2018, Fjedle et al. 2018, Haas and Ansorg 2018, Beber et al. 2019, Blair 2019, Di Salvatore 2019, Phayal 2019, Phayal and Prins 2019, Bara 2020, Bove et al. 2021), oftentimes not explicitly for causal inference purposes. The implementation of fixed effects can be helpful for making causal inferences due to its capacity to control for all observed and unobserved *time-invariant* factors of a specific unit. By creating a dummy variable for each unit, researchers can remove confounding effects that are unit-specific. Confounding effects such as these are often hard, if not impossible, to identify, which lends credit to the implementation of fixed effects. However, two glaring issues with the implementation of fixed effects for making causal inferences in the PKO literature should be noted. First, the implementation of fixed effects for the study of PKOs *as an event* for the study of post-conflict peace is impossible given that the presence of a PKO in the prior conflict is a *time-invariant variable*. In other words, it is *fixed*, meaning that a scholar studying PKOs would be unable to determine the effect of PKOs independent of the other unit-specific fixed factors. This problem, in particular, can be avoided if one alters their research question and/or their measure of PKOs. For example, if one is studying the potentially pacifying effects of PKOs *during* conflict, then PKOs, as an effect, are not fixed because the data set covers the temporal range both pre- and post-PKO. Alternatively, if one chooses not to measure PKOs using a dummy, opting to include a fluid measure such as the number of personnel involved in the PKO instead, fixed effects can still be employed given that the PKO measure is no longer a time-invariant variable. Still, while fixed effects accounts for all time-invariant aspects of a unit, it does not eliminate the potential for a *time-variant* confounder to slip through the cracks and bias estimates. While time-specific factors can be accounted for with a two-way fixed effects model that controls for each individual time-unit, errors can still occur in obtaining causal estimates from this approach (Imai and Kim 2021).

**Insert commentary on the synthetic control method here**

A final, although less utilized, method for making causal inferences from observational peacekeeping data is the difference-in-differences (DiD) approach. To my knowledge, only one contribution to the literature has been made using this approach (Phayal 2019). Simply put, DiD estimates a causal effect by obtaining the difference in outcome for a treated and control group by factoring in differences between- and within-units pre- and post-treatment. In this way, DiD allows researchers to demonstrate the counter-factual outcome for treated units *had treatment never occurred*. To make accurate causal inferences using this approach, two assumptions should be met. First, the timing of treatment should be constant across all units that receive treatment. Within the context of PKOs, this will be violated for any study examining the causal effect of PKOs at the national-level (where most of the PKO research is concentrated) as the initiation of PKOs globally varies across time. Second, DiD relies on the parallel trends assumption, which assumes that the trend in the outcome of interest (violence against civilians in Phayal 2019, for example) is largely the same for both treated and untreated units pre-treatment. In many contexts within the peacekeeping literature, this could easily be violated as sub-national units may vary wildly with respect to trends in outcomes. Within the context of violence against civilians, certain regions within a country may experience a trend dramatically different than others due to the concentration of the fighting or the location of ethnic groups, for example.

**Justify my project using DiD**

* Need to assess causal impacts more in PKO literature
* This paper uses an alternative operationalization of pacifying effects of PKOs
* Need explicit documentation on the parallel trends assumption
* To my knowledge, this paper will be the first to execute sensitivity analysis
* In addition, this paper will be the first to use DAGs?
* This paper will also use more commonplace DiD robustness checks

One particularly well-suited method for the study of the pacifying effects of PKOs is the synthetic control method (SCM). Much like difference-in-differences, the SCM attempts to answer the counter-factual question of "what would the outcome for a unit look like if a unit was never exposed to treatment?" Unlike DiD, the SCM is not burdened by the parallel trends assumption. While it does carry its own set of assumptions, I argue that the method is applicable to the peacekeeping literature. Further, its intuitive logic is particularly appealing for communicating causal effects. Below, I outline the synthetic control method, discussing its virtues, its requirements, and its functionality for making causal inferences.

**The Synthetic Control Method (this will need to be deleted)**

The synthetic control method is a powerful policy evaluation tool that has been employed in a variety of applications to assess causal impacts of right-to-carry laws (Donohue et al. 2019), vaccination lotteries (Lang et al. 2022), Basque terrorism (Abadie and Gardeazabal 2003), German re-unification (Abadie et al. 2015), economic liberalization (Billmeier and Nannicini 2013), the rule of Hugo Chavez (Grier and Maynard 2016), and anti-tobacco legislation (Abadie et al. 2010). A useful way to view the SCM is as a robust tool to assist in making causal inferences from case studies (Abadie et al. 2015). Conventional case study approaches face serious problems with causal inference due to the myriad of issues that arise when a researcher selects a comparison unit to examine the difference between the treated and non-treated unit. Researchers can do their best and apply their substantive knowledge on units to select cases that are highly similar to each other in an effort to isolate the causal impact of the treatment. However, no two units are alike, especially in the comparative politics and international relations literatures where the level of aggregation concerns complex units such as countries. As a result, any difference in outcome between treated and non-treated units could be caused by the difference in known characteristics in which the units were compared on and/or the difference between the units with respect to unspecified confounding factors.

The synthetic control method addresses these issues by comparing the treated unit to a synthetic version of the same unit that *differs only in the exposure to the treatment*. In this way, the SCM is an excellent tool for assessing the counter-factual question of what the outcome for the unit would have looked like in an alternative scenario where the *treatment not occurred*. The causal effect of the treatment is the difference in the outcome between the treated and synthetic unit following exposure to the treatment. Confidence in the synthetic unit as a legitimate representation of the non-treated real unit is obtained by the synthetic unit's ability to mimic the variations in outcome of the treated unit pre-treatment. The synthetic unit is constructed by the generation of a weighted average of the outcome variable using the values of similar units that are not treated. In this manner, the generation of the synthetic unit follows the logic of matching where the synthetic unit serves as a counter-factual that is similar to the treated unit but differs from the treated unit because it is constructed entirely from units that are never exposed to the treatment. Because of this, the synthetic unit could be viewed as an improvement, in some respects, on matched units from a matching-based research design as the synthetic unit artificially creates a counter-factual unit rather than relying on a similar unit to serve as a counter-factual. Once the synthetic unit is constructed, weights for similar non-treated units can be reported to maximize transparency of what the synthetic unit is consisted of. Similarity is determined based on variables designed to predict the outcome of the treated unit. For example, if one wished to develop a synthetic New York to assess the causal impact of a particular education policy on graduation rates, predictors of graduation rates would be used to develop the synthetic New York. A good synthetic unit is one in which the average value of the synthetic unit's predictors is similar to the average value of these variables for the treated unit. Once plotted on a time-series graph, the values of the treated and synthetic unit should closely align pre-treatment.

A number of assumptions should be met to utilize the synthetic control method (Abadie 2021). Fortunately, the nature of the question and data availability render the study of the pacifying effects of peacekeeping easily applicable to this method. *First*, if the treatment is comparatively small in scope (and, as follows, will likely generate a small causal effect), the SCM may be unable to detect this small effect, as analyzing this potentially small effect may be absorbed by noise in the outcome given the large level of aggregation (country-year level for this project). *Second*, for the construction of a synthetic unit, a large donor pool of similar units not exposed to the treatment is required. Given that many post-conflict countries never received a PKO during the prior conflict, this is not a concern for this project. *Third*, it is problematic if actors within a unit alter their behavior in anticipation of receiving treatment. While actors within a country have the capacity to anticipate the onset of a PKO, this anticipatory factor is unlikely to affect *post-conflict* dynamics as PKOs are often sent *during* conflict and any such anticipatory effects are likely to be observed within this time frame. *Fourth*, the treatment should ideally not interfere with the outcome of other non-treated units, lest these non-treated units used to create the synthetic unit be tainted with spillover effects from the treatment. While one could make a case that PKOs have a broadly pacifying effect globally, extant literature does not suggest such an effect. Further, on practical grounds, it seems unlikely that the onset of a PKO for a particular case has the capacity to significantly impact the prospects for post-conflict peace globally.[[1]](#footnote-1) *Fifth*, the treated case analyzed with this method should not be an extreme case with respect to the outcome, as it will be difficult to create a synthetic unit to match the treated unit. *Sixth*, ample data must be available for both the pre- and post-treatment periods to demonstrate the fit of the synthetic unit pre-treatment and to assess the full causal impact post-treatment. Given the availability of PKO and conflict-related data across time, this should not be a concern for this literature. *Lastly*, the SCM requires data to be aggregated at a large level, such as country-year or state-year levels. Again, this is not an issue with this inquiry given that most research in this domain is conducted at the country-year level.

**Research Design**

*DiD Discussion*

*Treatment and Control Selection*

*Outcome Measurement (Terrorism because it occurs during and after conflict)*

*Robustness Checks*

*Sensitivity Analysis*

**Case Background**

*Introduce the case (briefly)*

*Justification of Case (Greig’s Comments About Specifying that I am talking about a large-in-scope PKO, Assumptions of Synthetic Control, Has any other study done a case study on this case?)*

*The Conflict*

*The Peacekeeping Operation*

**Results**

1. Still, I do acknowledge this critique as a valid concern given the literature on the relationship between contiguity and conflict (Salehyan and Gleditsch 2006, Buhaug and Gleditsch 2008, Cederman et al. 2013). Further, because the synthetic unit is constructed from similar non-treated units (and many of these units may be contiguous to the treated unit), this warrants caution in the creation of the synthetic unit. [↑](#footnote-ref-1)