Evaluating the conflict-reducing effect of UN peacekeeping operations*

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Abstract

During the past two decades there has been a dramatic increase in both funds spent and troops sent on peacekeeping operations (PKOs). At the same time, systematic research on the efficacy of PKOs to guide policy making is still scarce. We approach this question by simulating the effect of various possible UN peacekeeping policies. We base the simulation on a statistical model that estimates the efficacy of UN PKOs in preventing the onset, escalation, continuation, and recurrence of internal armed conflict in the world for the period 1970–2008. Apart from new data on UN PKO budgets and mandates, the model includes the most important predictors of armed conflict. We use out-of-sample validation of prediction performance to identify the best statistical model and to evaluate its predictive performance. Predictions of how various PKO policies affect future conflict levels are then obtained through simulating the behavior of the conflict variable as implied by the estimates from the statistical model, using projections of demographic and education-related variables from the UN and the IIASA. Our results show that in a scenario where the UN is willing to issue PKOs with strong mandates and increase its PKO budget by 50 percent, the risk of armed conflict in the world in 2035 would be reduced by up to two thirds relative to a scenario without PKOs. Considering the enormous costs of armed conflict, in terms of both human suffering and foregone economic development, our results suggest that UN peacekeeping is a cost-effective way of increasing global security.

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1 Introduction

Peacekeeping has become a common tool for resolving conflicts and establishing conditions for a stable peace in war-torn countries. The United Nations spends more money on peacekeeping today than ever before. Against this background, we are interested in evaluating the effect of peacekeeping operations (henceforth PKOs) and their potential for reducing conflict in the future. How effective are PKOs in decreasing the risk of conflict? And what type of effect can we expect from PKOs in the future, depending on what peacekeeping policy the UN employs?

Answers to these questions are not so straightforward. PKOs may affect future conflict through several pathways. They may increase the duration of post-conflict peace; they may prevent contagion to neighboring countries; they may reduce the lethality of ongoing conflicts; and may even reduce the intensity of the conflict should it recur. The impact of a PKO is likely to last for a long time. Internal conflicts that break out typically last 5–10 years, and the risk of conflict recurrence is high for at least a decade after the war ends. Recurrent wars also tend to drag out for years. A successful conflict prevention, then, will benefit the country and its neighborhood for 20–30 years relative to the counterfactual.

Several studies show the beneficial effects of PKOs along *one* of these pathways: peacekeeping reduces the amount of violence during conflict (Gilligan and Sergenti 2008), it increases the chances of conflict ending (Doyle and Sambanis 2006*a*) it reduces the risk of conflict recurrence a few years after a war has ended (Doyle and Sambanis 2000; **?**), and PKOs limit the onset of conflict in neighboring countries (Beardsley 2011). However, none of these studies assesses the total effect of PKOs along multiple pathways, and they are therefore likely to severely under-estimate the benefits of PKOs.

In this paper, we make use of simulations based on a statistical model to evaluate how PKOs affect future incidence of armed conflict along all these pathways. Earlier studies on peacekeeping have shown that the size of PKO budgets and the robustness of their mandates are important for building peace. We use simulations to evaluate the substantial impact of those variables on the risk of conflict in the period 2010–2035. We specify eight scenarios reflecting different potential policies on how much to spend on peacekeeping and what mandates to provide, which countries to target, and how soon a mission is deployed after a major conflict breaks out. These scenarios are informed by previous research on where peacekeepers go, our own statistical estimations of relevant factors, and reports by UN sources about the likely future of peacekeeping.

Our findings show that peacekeeping works. The more the UN is willing to spend on peacekeeping, and the stronger the mandates provided, the greater is the conflict-reducing effect. We estimate that an ambitious UN peacekeeping policy will reduce the global incidence of armed conflict by two thirds relative to a no-PKO scenario. This reduction is maintained throughout our 25-year time frame. This is a substantial effect for an intervention that often is practical to implement if the political will is present. Even if a strong commitment scenario means an initial sharp increase in the total UN PKO budget, our simulations show that

the budget would only increase for approximately ten years, and then start decreasing as a consequence of the global reduction in the incidence of conflict. PKOs can thus be viewed as a long-term investment for peace.

The paper is organized as follows. We begin by providing a review of previous research on the conflict-reducing effect of PKOs. Subsequently, the methodology is presented, describing the simulation procedure as well as the data used. After that we present the results of the effect of our peacekeeping variables in the period 1970–2009, based on our statistical analysis. We then discuss and assess the determinants of PKO deployment in order to formulate a number of likely future PKO scenarios. Thereafter, the simulation results for the various scenarios for the period 2010–2035 are presented. The last section offers some conclusions.

2 The conflict-reducing efficacy of PKOs

The literature has identified three pathways through which PKOs may be effective. One such pathway is by preventing conflict from breaking out or recurring. The task of maintaining peace in a post-conflict situation was the original intention of peacekeeping, and remains the most studied effect of PKOs. Doyle and Sambanis (2000) was the first quantitative analysis of the effect of PKOs on the duration on post-conflict peace. The authors find a significant and substantial positive effect of peacekeepers on peace building, measured two, five, or ten years after the end of the conflict. This conclusion holds in several later studies. **?**Fortna (2008) finds that the risk of repeat war drops 'by 75%–85% or more when peacekeepers are present' (Fortna 2008, 125).

? finds a marked difference between the effectiveness of PKOs during and after the cold war. She finds no significant effect of PKOs on peace duration for the full post-World War II period, but a substantial and significant effect of all types of PKOs after the cold war (**?**, 283). Similarly Sambanis (2008) concludes from analyzing the short and long term effects of UN PKOs that 'the UN has actually become better at peacekeeping over time'. More generally, he finds that the effect of PKOs is strongest in the first few years, but in the long run only local economic recovery and institution building can ensure a lasting peace. The same conclusion is reached by Collier, Hoeffler and Söderbom (2008). They argue that economic recovery is the best way to achieve a stable peace, but that PKOs can make a substantial difference. Looking more broadly at third-party enforcement of peace settlements, Hartzell, Hoddie and Rothchild (2001, 200) find that five years after 'the signing of a peace agreement, the survivor rate among settlements with an external assurance is 68 percent compared with 32 percent for arrangements lacking such promise'.

A second pathway by which peacekeeping benefits peace is by enabling the cessation of fighting or by reducing the intensity of violence in an ongoing conflict. Doyle and Sambanis (2000) show that UN PKOs can in fact be effective in ending ongoing violent conflict, at least when provided with a strong enforcement mandate. PKOs with strong mandates are

also effective in managing violence against civilians in an ongoing armed conflict (Kreps and Wallace 2009; Hultman 2010) which may in turn have positive effects on the prospects of peace.

A third pathway through which peacekeeping works is by limiting the spatial and temporal contagion of conflict. Beardsley (2011) argues that the effect of peacekeeping goes beyond the mandated scope of the mission, and shows that PKOs are effective in reducing the likelihood of conflict in neighboring countries. By creating stability in one country, the risk of conflict contagion demonstrated by other studies (Gleditsch 2002; **?**) is thus strongly reduced.

One serious methodological challenge for these studies is the issue of selection bias – if the UN only sends missions to the easiest conflicts, the success rate of missions will be overestimated. This seems not to be a major problem, however. Gilligan and Sergenti (2008) explicitly address the non-random way in which PKOs are deployed and utilize a matching model to guard against selection bias. They construct a new dataset where cases of countries in which PKOs were deployed are matched to similar cases in which PKOs were not. They then find a clear peace-prolonging effect of UN PKOs (Gilligan and Sergenti 2008, 104). This effect is stronger than in the non-matched dataset, meaning that previous research most probably have *underestimated* the effect of PKOs – at least on peace duration after war. Moreover, Melander (2009) argues that since peacekeepers are sent to the most difficult cases, it is difficult to observe the positive effects. By accounting for this selection bias, he demonstrates that peacekeeping can also prevent genocidal violence breaking out.

From previous research we can conclude that peacekeeping in general has a conflict-reducing effect. However, all peacekeeping operations are not equally effective. The two characteristics that seem to be the most important are the operations' mandate and their size in terms of budget and troop strength. These are also the main aspects of PKOs that are politically established by the UN Security Council. Doyle and Sambanis (2000) find that traditional PKOs, characterized by unarmed or lightly armed troops with very limited mandates, do not have any effect on peace duration.[1] Multidimensional PKOs, on the other hand, 'are extremely significant and positively associated with' peace-building success (Doyle and Sambanis 2000, 791).[2] Similarly, Doyle and Sambanis (2006*a*) find that multidimensional and enforcement missions have a significant and substantial positive effect on peace-building success. Differentiating between a strict and a lenient definition of peace, they find that multidimensional PKOs 'works well with respect to both measures, [but] UN missions in general seem to have their greatest effect in preventing lower-level violence and enabling countries to democratize and rebuild institutions after civil war rather than prevent the resumption of full-scale war' (Doyle and Sambanis 2006*a*, 110).

[1] Interestingly, **?**, 238 finds that 'traditional peacekeeping missions and observer missions have been the most successful' while Doyle and Sambanis (2006*a*, 111) find that 'traditional peacekeeping does not work well, and may even have negative effects'.

[2] Discussing the problem of counterfactuals, King and Zeng (2007) argue that some of the Doyle and Sambanis (2000) findings are model dependent and unsupported by empirical evidence. Sambanis and Doyle (2007) dispute this claim.

Findings for the size of missions are a bit mixed. Doyle and Sambanis (2006*a*) argue that the number of peacekeeping troops is a poor predictor of peace-building success – the number of 'boots on the ground' must be considered in relation to the PKO's mandate. The reason for this, they argue, is that a 'large troop deployment with a weak mandate is a sure sign of lack of commitment by the Security Council (...) This suggests a mismatch between the nature of the problem and the treatment assigned by the UN' (Doyle and Sambanis 2006*a*, 113). However, most studies indicate that the size is important. Kreps (2010) argues that the capacity of a UN mission may explain the variation in their success, suggesting that military force is central for peacekeepers to succeed in conflict situations. In a study of micro-level effects of peacekeeping, Ruggeri, Gizelis and Dorussen (2013) show that the mission size increases the level of co-operation by the conflict parties.[3] In addition, when estimating the determinants of post-conflict risk Collier, Hoeffler and Söderbom (2008) find that 'doubling [PKO] expenditure reduces the risk from 40% to 31%'. While some missions receive an annual budget of well over a billion USD, other budgets are limited to less than 50 millions. Since the budget sets clear limits to the number of troops that can be employed, it should influence the prospects for peace.

To summarize, PKOs are effective – and they are effective in generating peace through different pathways. While selection bias may lead scholars to underestimate the effect of peacekeeping, so does a focus on single pathways to peace. It is thus possible that PKOs are even more effective than previously suggested. The factors that have been emphasized as particularly important for enhancing the effectiveness of PKOs are the type of mandate provided by the Security Council, as well as the size of the mission.[4] Based on the theoretical explanations proposed by previous research, we should thus expect PKOs with stronger and wider mandates as well as larger budgets to be more successful. But how much more successful can we expect them to be? We formulate several different PKO scenarios in which we vary these crucial PKO components when making predictions about the effectiveness of PKOs in reducing armed conflict. Before turning to these scenarios, we introduce the methodology we use to estimate the effect of PKOs and make predictions into the future.

3 Methodology

3.1 Statistical model

Earlier studies of PKOs limit their attention to particular pathways of effects, and consequently restrict the analysis to a subset of the situations in which PKOs may affect the occurence of conflict. Doyle and Sambanis (2000), for instance, only analyze post-conflict

[3] This positive effect also seems to exist at the macro level. Time trends presented by Heldt and Wallensteen (2006) suggest that an increase in the number of UN troops deployed in peace operations during the 1990s coincided with a decrease in the number of intrastate armed conflicts.

[4] These are often closely related, since a robust mandate requires a larger budget to be implemented, but not necessarily so, as argued by Doyle and Sambanis (2006*a*).

countries, and restrict attention temporally to the first ten years or until conflict reerupts, whichever comes first. ?Fortna (2008) has a similar setup, and includes post-conflict peace periods also after the first ten years (but disregards countries if conflict reerupts). Beardsley (2011) has the most extensive dataset, including all state-months at risk of armed conflict onset, but does not include information on conflict duration.

A PKO that succeeds in restraining a conflict to a few scores of annual deaths, may shorten the conflict, increase the post-conflict duration and even decrease the duration and intensity of any recurrence that occurs, as well as decreasing the risk and intensity of contagion to other countries. In principle, potential contagion has no limits. If the Afghan internal armed conflict could have been restrained in the mid-1970s, there might have been no attack on the World Trade Center in New York in 2001. To assess the total effect of PKOs along all the pathways, we must analyze all country years within the period we are studying, not only those where PKOs are deployed. We must also use available information on the intensity of armed conflict to see whether intensity of conflict is affected. The UCDP dataset records whether conflicts are minor (25–999 deaths per year) or major (1000+ deaths).

To achieve this, a central feature in our modeling is the (annual) transition probability matrix for the transitions between peace, minor, and major conflict. The observed transition probability matrix is given in Table 1. The relative frequency of transition in a given year from minor conflict to major conflict, for instance, have been 0.103, whereas the relative frequency of transition from major to minor conflict was 0.205.

Table 1: Transition probability matrix: Conflict at t vs. at $t-1$, 1970–2009

	(Conflict level at t)			
Conflict at t-1	No conflict	Minor conflict	Major conflict	Total
No conflict	5078 (0.965)	155 (0.029)	21 (0.004)	5254 (1.000)
Minor conflict	145 (0.207)	481 (0.689)	72 (0.103)	698 (1.000)
Major conflict	24 (0.077)	70 (0.205)	247 (0.724)	299 (1.000)
Observations	5247	706	340	6239

Row proportions in parentheses.

To simultaneously determine how PKOs (and other explanatory variables) have affected the probability of onset, escalation, deescalation and termination of armed conflict in the 1970–2009 period, we estimate a multinomial logit model with lagged dependent variables and interaction terms between explanatory variables and the lagged dependent variables.[5] This model allows representing the transition probabilities in Table 1 as functions of the explanatory variables we describe in the next section.[6]

We estimate the statistical relationship between the incidence of conflict and the presence of PKOs of various types and budget sizes, controlling for other factors that have been shown

[5] Such models are often referred to as 'dynamic' models, e.g. in Przeworski et al. (2000).

[6] We also make use of information of conflict history before $t-1$, see Section 3.3.

to affect the risk of conflict.[7] The models are estimated on data for all countries for the 1970–2009 period.

In what follows, we treat the deployment of peacekeeping operations as an exogenous variable. In Appendix A.1, we discuss this issue and test formally that the assumption of exogeneity indeed holds.

3.2 Simulation procedure

Our statistical model is able to capture the effects of PKOs along all three pathways for *individual* years, but further analysis is required to assess the effects along all the pathways seen over *multiple* years. To do so, we have developed a simulation routine that takes the estimated annual transition probabilities described above as its point of departure, but repeats the transitions for several consecutive years.[8]

This allows us to estimate the complete effect of PKOs. If a minor conflict breaks out in a hitherto peaceful country, this increases the estimated risk of conflict in that country every year for a couple of decades afterwards, as well as the risks of conflict in neighboring countries. If our statistical model finds that a PKO prevents the onset (or recurrence or escalation) of such a conflict, that is reflected in several subsequent transitions, too. Our simulation procedure allows us to estimate the probability of conflict for every country for every year over a 25-year period under different scenarios presented below, such as one where the UN stops deploying PKOs whatsoever, or one where the UN expands its level of ambition further. By comparing the global and regional incidence of conflict under these scenarios, we can aggregate the short-term effects identified by the statistical model up to a level which makes more sense for decision makers.

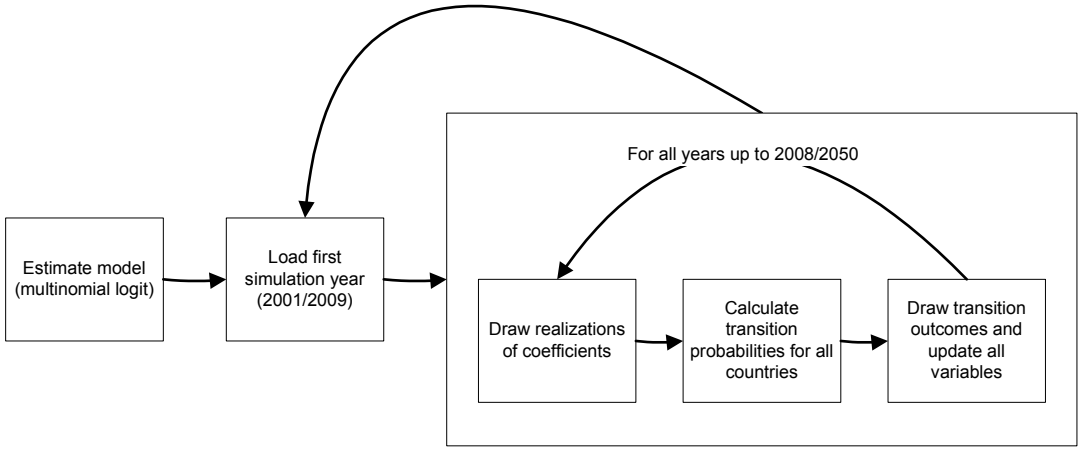
Evaluating the effect over as much as 25 years may seem excessive, but the effects of large-scale violent conflict do frequently last for at least as long as that (Collier et al. 2003). Hence, the beneficial effects of PKOs should be seen in a long perspective.

The general setup of the simulation procedure is illustrated in Figure 1 and summarized below. We use the methodology developed by Hegre et al. (2013). We perform the following steps: (1) Specify and estimate the underlying statistical model; (2) Make assumptions about the distribution of values for all exogenous predictor variables for the first year of simulation and about future changes to these. In this paper, we base the simulations for the predictor variables on UN projections for demographic variables and IIASA projections for education (see Section 3.3); (3) Formulate a set of scenarios for future values of PKO variables (see Section 5); (4) Start simulation in first year. We start in 2010 for the forecasts presented in

[7] for a review of conflict risk variables, see Hegre and Sambanis (2006).

[8] To illustrate using the transition probabilities in Table 1: The probability of going from no conflict to minor conflict is 0.033. If that happens, the probability that this country sees an escalation to major conflict is 0.103. If that happens, the probability of sustaining major conflict is 0.724. Over two years, countries can go from no conflict to major conflict through several intermediate steps. Matrix calculation on the transition probability matrix shows that the probability of going from no conflict to major conflict over 2 years through all possible pathways is 0.010.

Figure 1: Simulation flow chart



Section 6.1: (5) Draw a realization of the coefficients of the multinomial logit model based on the estimated coefficients and the variance-covariance matrix for the estimates; (6) Calculate the probabilities of transition between levels for all countries for the first year, based on the realized coefficients and the projected values for the predictor variables; (7) Randomly draw whether a country experiences conflict, based on the estimated probabilities; (8) Update the values for the explanatory variables. A number of these variables, most notably those measuring historical experience of conflict and the neighborhood conflict variables, are contingent upon the outcome of step 6; (9) Repeat (4)–(7) for each year in the forecast period, e.g. for 2010–2035, and record the simulated outcome; and (10)Repeat (3)–(8) a number of times to even out the impact of individual realizations of the multinomial logit coefficients and individual realizations of the probability distributions.

The simulation methodology is reasonably accurate. Hegre et al. (2013) show that the model specification used in this paper is able to predict about 63% of conflicts (minor or major) 7–9 years after the last year of data, with about 4% false positives.[9]

3.3 Description of data

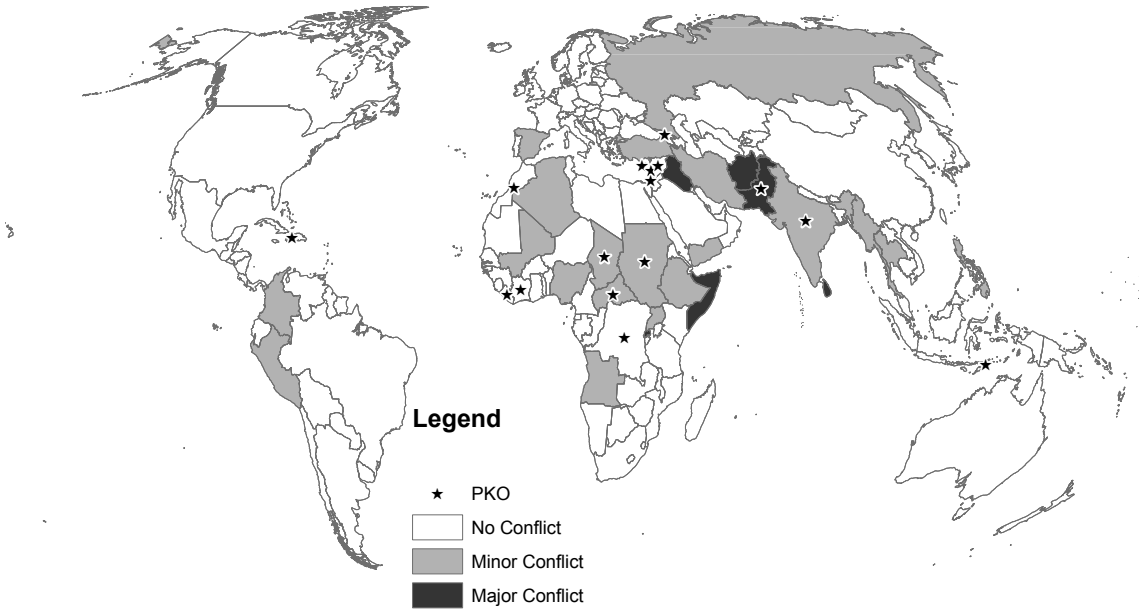
3.3.1 Dependent Variable

We are interested in evaluating the efficacy of PKOs in ending armed conflicts as well as preventing escalation and future recurrences. Therefore, the dependent variable in this study is a three-category variable denoting whether there is a minor conflict, a major conflict, or no conflict going on in a country in a given year.

The conflict data used in the estimation phase of the simulation are from the 2009 update

[9]Hegre et al. (2013) estimate the relationship between predictors and risk of conflict based on data for 1970–2000, simulates up to 2009 and compares simulation results for 2007–2009 with the most recent conflict data available for the same years (Harbom and Wallensteen 2010).

Figure 2: Map of conflicts ongoing in 2008



Source: Harbom and Wallensteen (2009) and Weidmann, Dorussen and Gleditsch (2010)

of the UCDP/PRIO Armed Conflict Dataset (ACD; Harbom and Wallensteen 2010; Gleditsch et al. 2002). The Armed Conflict Dataset records conflicts at two levels, measured annually. Minor conflicts are those that pass the 25 battle-related deaths threshold but have less than 1000 deaths in a year. Major conflicts are those conflicts that pass the 1000 deaths threshold. We only look at internal armed conflicts, and only include the countries whose governments are included in the primary conflict dyad (i.e., we exclude other countries that intervene in the internal conflict). Figure 2 shows the conflicts active in 2009 as well as the UN PKOs in action in that year.

3.3.2 PKO variables

We use data on PKOs from three different sources. We use Doyle and Sambanis (2006*a*)'s coding of mandates (hereafter we refer to Doyle & Sambanis 2006*a* as 'DS'). Based on their categorization, we code two types of mandates:[10]

- **Traditional PKO**

[10]The classification is discussed in detail in Doyle and Sambanis (2006*a*, p. 11–18).

1. Observer missions – restricted to observing actions such as a truce, troop withdrawal, or a buffer zone. Always deployed with the consent of the parties to the conflict. Examples are the UNMOT and UNMOP missions in Tajikistan and Croatia.
2. Traditional missions – also deployed with the consent of the parties, but with somewhat extended mandates such as policing a buffer zone and assisting in negotiating a peace agreement. Examples are the UNPRESEP mission in Macedonia 1995–99 and the UNIFIL mission in Lebanon.

- **Transformational PKO**

1. Multidimensional missions – referred to as 'second-generation operations', the mandates, also consent-based, are extended with activities intended to go to the roots of the conflict, such as economic reconstruction, institutional transformation (reform of police, army, judicial system, elections). Examples are the ONUSAC mission in El Salvador 1991–95 and the UNMIT mission in Timor-Leste (2006–).
2. Enforcement missions – 'third-generation operations' that do not require the consent of both parties, and therefore must draw on the authority of UN Charter articles 25, 42, and 43 to apply force to protect the activities of the operation. Examples are the UNPROFOR mission in former Yugoslavia 1992–95 and the UNMIS mission in Sudan (2005–).

The simplification of creating two categories out of the original four is based on the finding by DS that the latter two are significantly more effective than the two former types. We have also estimated alternative models using the original four-category variable as either a nominal or an ordinal variable, with fairly similar results. These estimations show that the transformational missions are more distinct from the traditional missions, both when it comes to when they are deployed and their effects on subsequent conflict risk. The remaining within-category differences are not sufficiently large to warrant splitting a small number of missions into many categories.

Since the DS dataset is not time-varying, we have coded changes in mandate based on the comments on adjustments to the mandate in Doyle and Sambanis (2006*b*). In some unclear cases, Fortna (2008)'s version of the DS data was consulted (which is time-varying but not annual). The DS data are coded up to 1999. For the years 2000–2009, we have coded the mandate on the basis of the definitions provided by DS, using UNSC resolutions and mandate information available at the DPKO website.[11] Appendix A.3 gives a list of all PKOs by mandate.

In order to capture the size of the PKO, we have coded the yearly expenditure for each mission, based on United Nations General Assembly published *appropriation* resolutions from

[11] http://www.un.org/en/peacekeeping

1946 to the present. The variable gives the yearly amount allocated by the UN for each specific mission. UN PKOs are mostly funded outside the ordinary UN budget, and appropriation resolutions were therefore quite straightforward to collect and code. A small number of missions, e.g. the United Nations Truce Supervision Organization (UNTSO), are funded directly through the UN's operating budget, and yearly expenditure data are harder to single out from other budget items. These missions, however, are all small and limited. For PKO years without expenditure data we use the average for the mission type as our best guess.

We have removed international PKOs such as the UNIKOM mission monitoring the Iraq-Kuwait conflict 1991–2003 – i.e. UN PKOs that are deployed in more than one country simultaneously under the same mandate. There are only four such missions and they are also listed in Appendix A.3.

3.3.3 Other predictor variables

To predict the future incidence of conflict, we add predictor variables that are associated with the risk of conflict and for which we have good projections for the 2010–2035 period.[12] As our baseline model, we use the model specification that was shown to produce the most accurate out-of-sample predictions in Hegre et al. (2013). For more information see this article.

Conflict History We model the *incidence* of conflict, i.e. whether the country is in a minor or major conflict in a given year. To model this appropriately, we include information on conflict status (no conflict, minor, or major conflict) at $t-1$, the year before the year of observation in the estimation phase in order to model the probability of transitions between each conflict level. The log of the number of years in each of these states up to $t-2$ is also included. We refer to this set of variables jointly as 'conflict history' variables.

Neighborhood We include information on conflicts in the neighborhood in order to model and simulate the spatial diffusion of conflicts. The neighborhood of a country A is defined as all n countries $[B_1...B_n]$ that share a border with A, as defined by Gleditsch and Ward (2000). More specifically, we define 'sharing a border' as having less than 100 km between any points of their territories. Islands with no borders are considered as their own neighborhood when coding the exogenous predictor variables, but have by definition no neighboring conflicts. The spatial lag of conflict is a dummy variable measuring whether there is conflict in the neighborhood or not. Hegre et al. (2013) does not find any difference between minor and major conflicts in terms of their diffusion potential.[13]

[12] Plausible and authoritative forecasts are required for our simulation exercise. This precludes including numerous interesting variables to the model, such as level of democracy, or characteristics of the termination of a previous conflict such as military victories or aspects of peace agreements. Taking these factors fully into account would require specifying a forecasting model also for these.

[13] Beardsley (2011) does not analyze this particular question.

Socio-economic data We use two indicators of socio-economic development, given development's strong relationship with the risk of conflict (Collier and Hoeffler 2004; Fearon and Laitin 2003; Hegre et al. 2001): The extent of secondary education and the infant mortality rates. Both variables are highly correlated with GDP per capita, for which we have no authoritative projections.

We use the education data of Lutz et al. (2007), providing historical estimates for 120 countries for the 1970–2000 period. The dataset is based on individual-level educational attainment data from recent Demographic Health Surveys (DHS), Labour Force Surveys (LFS), and national censuses. Historical estimates are constructed by five-year age groups and gender using demographic multi-state methods for back projections, and taking into account gender and education-specific differences in mortality. We employ a measure of male secondary education, defined as the proportion of males aged 20–24 years with secondary or higher education of all males aged 20–24. For the 2001– period (including forecasts) we use the accompanying scenario for educational attainment until 2050 (Samir and Lutz 2008). Our base scenario is their General Trend Scenario.

Infant mortality is defined as the probability of dying between birth and exact age 1 year, expressed as the number of infant deaths per 1000 live births. We use the medium scenario from the population projections, where total fertility rates for all countries are assumed to converge towards 1.85 children per woman according to a path similar to historical experiences of fertility decline.

Demographic data The demographic variables originate from the World Population Prospects 2006 (United Nations 2007), the most authoritative global population data set which covers all states in the international system between 1950 and 2005 and provides projections for the 2005–2050 period. Two key demographic indicators are used in this study. Total population is defined as the *de facto* population in a country, expressed in thousands. The measure has been log-transformed following an expectation of a declining marginal effect on conflict risk of increasing population size (see Raleigh and Hegre 2009).

We also add a variable reflecting the country's age structure. Cincotta, Engelman and Anastasion (2003) and Urdal (2006) report increasing risks of minor armed conflict onset associated with youth bulges. An emerging consensus is that youth bulges appear to matter for low-intensity conflict, but not for high-intensity civil war. Age-specific population numbers are provided by the United Nations (2007), and youth bulges are measured as the percentage of the population aged 15–24 years of all adults aged 15 years and above. For the youth bulge measure, the three scenarios yield identical estimates until 2024 since the relevant youth cohorts were already born by 2005. Beyond 2025, the different fertility assumptions lead to significant variation in the youth bulge projections for many countries.

Temporal and regional dummies We could fit the model better to the data by adding yearly fixed effects – there are good reasons to believe that the underlying transition proba-

bility matrix for a country with a given set of characteristics is fluctuating over the observed period. Hegre et al. (2013), however, are unable to find temporal dummies that unambiguously improve the predictive performance of the model. Consequently, we do not include such terms in the model for this paper.

We include three regional dummies to account for residual regional differences in risk of conflict after controlling for all predictor variables. Hegre et al. (2013) only find three regions to be at least vaguely distinct in this manner: Eastern Europe, Western Africa, and the rest of Africa south of Sahara. The rest of the world is the reference category for the regional variable.

Interaction terms Our control variables may not have the same effect on the probability of conflict onset as on conflict termination. To model this 'dynamic' model (Przeworski et al. 2000), we include multiplicative interaction terms between the control variables and the conflict history variables.[14]

4 Estimation results, 1970–2009

Table 2 shows the results of estimating a multinomial logistic regression model including the log of annual PKO expenditures as well as our control and interaction variables.[15] Table 3 shows the results for a model distinguishing between the different PKO mandates.

4.1 Short-term effects of PKOs

Increasing PKO expenditures does not affect the probability that a country is in minor conflict in a given year, but clearly reduces the probability of major conflict. Figure 3 shows the estimated short-run effect on the risk of major conflict of the budget of PKOs based on the results in Table 2.

A conflict country where a peace-keeping operation with an annual budget of USD 15 million per year is in place, has a 50% lower risk of major conflict than a conflict country without any PKO. A mission with an annual budget of 500 million has more than 80% lower risk than the no-PKO country.[16] The effect is comparable to that found by Collier, Hoeffler

[14]The sizeable number of interaction terms entails some loss of efficiency, but also improves the predictive performance of the model (Hegre et al. 2013). Since we assess the total impact of our variables by means of simulations, the high number of parameters do not give rise to interpretational or collinearity problems. The only concern is whether the complexity of the model gives rise to 'empty cell' problems. As can be seen from the frequencies in Table 1, this is not likely to be a problem. The estimates obtained below (e.g., Table 2) do not indicate any such difficulties.

[15]For reference, we report the results for a model ignoring peace-keeping operations entirely in Appendix A.4 , Table A-5.

[16]We have also estimated models with a squared log expenditure variable to investigate whether the relationship between PKO expenditure and the risk of conflict might be curvilinear. The squared variable did not improve the goodness-of-fit of the model.

Table 2: Estimation results, determinants of conflict, PKO budget variables

	1		2	
Log PKO expenditures	-0.00792	(-0.18)	-0.259**	(-3.11)
Minor conflict t-1	2.443	(1.33)	3.018	(0.95)
Major conflict t-1	0.234	(0.07)	4.383	(1.07)
Log time in status c0	-1.240***	(-14.72)	-1.586***	(-9.87)
Log time in status c1	1.153***	(10.00)	0	(.)
Log time in status c2	0	(.)	1.217***	(7.13)
Conflict in neighborhood	0.651**	(2.89)	0.792	(1.63)
NC * minor conflict at t-1	-0.612*	(-2.32)	-0.611	(-1.17)
NC * major conflict at t-1	-1.323***	(-3.41)	-1.304*	(-2.25)
NC * time in status c0	-0.134	(-1.40)	-0.203	(-0.97)
Log population	0.345***	(3.48)	0.188	(1.09)
Population * minor conflict at t-1	-0.00258	(-0.02)	0.187	(0.93)
Population * major conflict at t-1	-0.0394	(-0.21)	0.138	(0.58)
Population * time in status c0	-0.0483	(-1.17)	0.0709	(0.89)
Log infant mortality rate	0.0196	(0.06)	1.976**	(3.00)
IMR * minor conflict at t-1	-0.246	(-0.61)	-1.783*	(-2.41)
IMR * major conflict at t-1	-0.214	(-0.40)	-1.996*	(-2.51)
IMR * time in status c0	0.264*	(1.99)	-0.304	(-1.11)
Youth bulge	0.00887	(0.23)	-0.141	(-1.89)
Youth * minor conflict at t-1	0.00103	(0.02)	0.176*	(2.09)
Youth * major conflict at t-1	0.105	(1.45)	0.244*	(2.49)
Youth * time in status c0	-0.00773	(-0.47)	0.0457	(1.34)
Education	-1.662*	(-1.99)	1.284	(1.03)
Education * minor conflict at t-1	-0.00717	(-0.01)	-1.520	(-1.01)
Education * major conflict at t-1	2.405	(1.62)	-1.960	(-1.12)
Education * time in status c0	0.442	(1.35)	-0.332	(-0.56)
Log IMR in neighborhood	-0.307	(-1.43)	-0.0915	(-0.30)
Education in neighborhood	-0.505	(-0.83)	-0.759	(-0.87)
Eastern Europe	-0.427	(-1.15)	0.423	(0.75)
Western Africa	-0.140	(-0.58)	-1.844***	(-3.40)
Rest of SS Africa	0.0731	(0.44)	-0.0641	(-0.28)
Constant	-3.269*	(-2.49)	-8.542**	(-3.26)
N	5942			
ll	-1518.4			

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Estimation results, determinants of conflict, PKO mandate variables

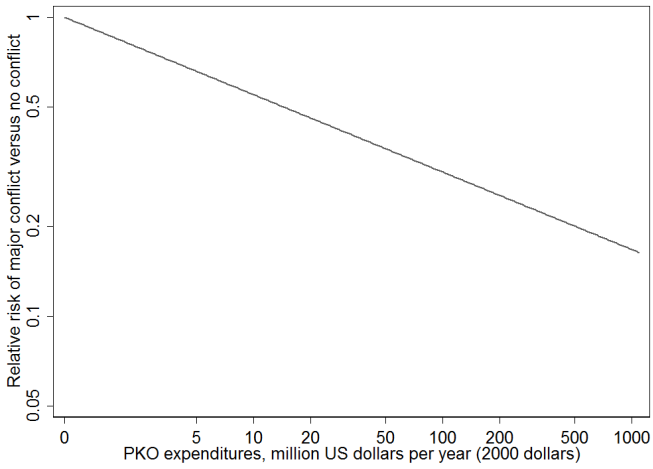
	1		2	
Traditional PKO	-0.0757	(-0.28)	-0.462	(-1.14)
Transformational PKO	-0.0934	(-0.29)	-2.816**	(-2.68)
Minor conflict t-1	2.434	(1.32)	3.020	(0.94)
Major conflict t-1	0.337	(0.10)	4.560	(1.11)
Log time in status c0	-1.241***	(-14.72)	-1.585***	(-9.85)
Log time in status c1	1.151***	(9.98)	0	(.)
Log time in status c2	0	(.)	1.203***	(7.02)
Conflict in neighborhood	0.648**	(2.87)	0.778	(1.60)
NC * minor conflict at t-1	-0.610*	(-2.31)	-0.614	(-1.17)
NC * major conflict at t-1	-1.329***	(-3.41)	-1.293*	(-2.23)
NC * time in status c0	-0.132	(-1.39)	-0.206	(-0.97)
Log population	0.343***	(3.47)	0.186	(1.07)
Population * minor conflict at t-1	-0.00438	(-0.03)	0.190	(0.94)
Population * major conflict at t-1	-0.0446	(-0.24)	0.152	(0.64)
Population * time in status c0	-0.0477	(-1.16)	0.0751	(0.93)
Log infant mortality rate	0.0204	(0.06)	1.999**	(3.05)
IMR * minor conflict at t-1	-0.238	(-0.59)	-1.752*	(-2.37)
IMR * major conflict at t-1	-0.210	(-0.39)	-2.040*	(-2.57)
IMR * time in status c0	0.263*	(1.98)	-0.307	(-1.12)
Youth bulge	0.00932	(0.24)	-0.135	(-1.82)
Youth * minor conflict at t-1	0.000446	(0.01)	0.170*	(2.03)
Youth * major conflict at t-1	0.104	(1.43)	0.241*	(2.46)
Youth * time in status c0	-0.00781	(-0.47)	0.0450	(1.32)
Education	-1.659*	(-1.98)	1.419	(1.13)
Education * minor conflict at t-1	0.0136	(0.01)	-1.455	(-0.95)
Education * major conflict at t-1	2.379	(1.61)	-2.061	(-1.17)
Education * time in status c0	0.437	(1.33)	-0.347	(-0.58)
Log IMR in neighborhood	-0.307	(-1.43)	-0.0850	(-0.28)
Education in neighborhood	-0.485	(-0.80)	-0.830	(-0.95)
Eastern Europe	-0.423	(-1.13)	0.480	(0.85)
Western Africa	-0.138	(-0.57)	-1.838***	(-3.39)
Rest of SS Africa	0.0756	(0.45)	-0.0443	(-0.19)
Constant	-3.271*	(-2.48)	-8.847***	(-3.36)
N	5942			
ll	-1516.2			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and Söderbom (2008), although somewhat weaker – their estimate for log expenditures is larger (in absolute terms) than –0.4, compared to our estimate of –0.259.[17]

Figure 3: Estimated effect of budget



Also when represented in terms of their mandates, transformational PKOs directly affect the risk of major conflict only. The estimate for the transformational PKO is large and clearly significant. It implies that a transformational PKO reduces the risk of major conflict relative to no conflict by more than 90%. The estimate for traditional PKOS is negative but not statistically significant. The parameter estimate implies that the risk of major conflict is 35% lower in the presence of a traditional PKO.[18]

4.2 Conflict history

That we do not find any direct or short-term effects of peace-keeping operations on minor conflicts does not mean that PKOs only reduce the intensity of conflicts. The transition probability matrix in Table 1 shows that the probability of no conflict in a year is 0.182 after a minor conflict, but only 0.077 after a major conflict. The probability of minor conflict in a year after major conflict is 0.264. Given that PKOs increase the probability of transitions from major to minor conflict in year t, they will also increase indirectly the probability of no conflict at $t + 1$.

The estimates for the conflict history variables in Tables 2 and 3 show that this holds more generally. The probability of minor conflict is much higher if there was a minor or

[17] Collier, Hoeffler and Söderbom (2008) include a dummy for 'no PKOs'. This may explain much of the difference in estimates.

[18] Although the categorizations are different, these findings are slightly different from Fortna (2008) who finds that consent-based missions are in general more successful than enforcement missions. However, this discrepancy is likely to be a result of different designs, since she only measures the duration of peace given a cease-fire agreement, which leads to a particular selection of cases. Our results show the general ability of peacekeeping to reduce the likelihood of conflict along all pathways, and in that context it is not surprising that more extensive mandates are more successful; see e.g. Doyle and Sambanis (2000).

major conflict the year before.[19] Moreover, the estimates for the 'log time in status c0' terms show that the probability of conflict is much lower if the country has been at peace for several years.

Effective prevention of major conflict, then, may reduce the incidence also of minor conflicts since minor conflicts in general more easily come to an end. The best way to assess the combined effects of these estimates is by looking into the simulated results we present in Section 6.1. First, though, we present the PKO scenarios that we evaluate in the simulation.

5 Description and motivation of scenarios

Given that the UN has gone through a qualitative and quantitative change during the last two decades, it is difficult to predict exactly what the future of UN peacekeeping will look like. According to a recent report by the UN which reflects on the future of peacekeeping, resources are already stretched to its limits (United Nations 2009). With the global economic crisis, potential resources are also shrinking. At the same time, the demand for peacekeeping might become more intense (United Nations 2009).

5.1 PKO deployment rules for simulations

In our simulations, future conflicts occur randomly albeit with probability distributions according to the results in Tables 2 and 3. Since we do not know where conflicts will occur, we cannot know where PKOs will be needed. We therefore have to specify rules for where our simulations will 'send' PKOs. These rules are based on studies identifying factors influencing the likelihood of intervention in internal conflicts by the UN or other third parties.

Gilligan and Stedman (2003, 38) argue that 'the UN acts in ways that corroborate its humanitarian and security missions (...) one of the best predictors of UN intervention is the number of deaths in a conflict'. Similarly, **?**Fortna (2008) finds that UN peacekeepers tend to 'deploy to more difficult cases rather than to easier ones' (Fortna 2008, 44), where difficult cases are mainly defined as conflicts with strong rebels.[20]

In an analysis of where PKOs are deployed (reported and discussed in Appendix A.2), we confirm that PKOs indeed are more frequently deployed to major conflict than to minor ones in our dataset. Given limited resources, the UN prioritizes the most intense conflict areas which constitute the greatest threats to regional stability. Our first rule is accordingly:

Rule 1 *Peace-keeping operations are initiated if the conflict is major (more than 1,000 battle deaths in the previous year).*

[19] This inference is based on the multiple interaction terms involving conflict at $t-1$.

[20] In contrast to Gilligan and Stedman (2003), **?** does not find that the number of fatalities or the duration of the conflict is a significant predictor of UN intervention. Still, the authors at least tacitly agree that peacekeepers are sent to the more intractable conflicts, although they differ on what exactly intractability implies.

The UN is unlikely to deploy a mission in the first year of armed conflict. Other diplomatic tools are considered first, and the Security Council needs to come to an agreement before a PKO can be established. Gilligan and Stedman (2003) also find that the duration of conflict matters significantly. The longer a conflict lasts, the higher the probability of a UN intervention. To give two recent examples, the mission in Sierra Leone was initiated in the second year of major conflict, and the mission in the Democratic Republic of Congo was initiated in the fourth year of major conflict. This very general rule roughly captures the reaction time of the UN. We consequently specify a second rule:

Rule 2 *A PKO is established in the third consecutive year of major armed conflict.*

The third rule specifies the duration of PKOs. The exact number of years chosen is somewhat arbitrary, but is supported by the estimates in the incidence model in our analysis of where PKOs go (Table A-3).

Rule 3 *Peacekeepers remain for five years after last year with conflict activity (more than 25 battle-related deaths within a calendar year). This rule also applies to all PKOs active in 2009.*

The fourth and fifth rules restrict PKOs from being deployed in certain countries. Mullenbach (2005) argues that international-level factors are more important than state-level factors in determining where third parties intervene. Controlling for state- and conflict-level factors, he finds that third-party interventions are less likely when the government of the target state has a military alliance with a major power and significantly less likely when the target state is a major power (Mullenbach 2005, 549–52). Major powers are reluctant to welcome international involvement in their internal affairs, and have as permanent members of the Security Council (P5) authority to veto such decisions.

Rule 4 *PKOs are never deployed in permanent UNSC members.*

Moreover, the UN is also highly unlikely to establish a PKO in states with very large populations. (Gilligan and Stedman 2003, and our analysis in Table A-3). The largest country ever to attract a PKO is Sudan, with a population of 37 millions in 2005. Therefore, in all scenarios except S4, S7, and S8, our simulations adher to a final rule:[21]

Rule 5 *For most scenarios, PKOs are deployed only in countries that have smaller populations than 100 millions in 2009.*

[21] This precludes PKOs in Bangladesh, Brazil, India, Indonesia, Japan, Mexico, Nigeria, and Pakistan in addition to the permanent UNSC members.

5.2 Specifying PKO scenarios

We specify eight different scenarios to explore the effect on the global incidence of conflict of various UN policies. The first scenario (S1) is a comparison scenario where the UN terminates all PKO activity in 2010. Here, the only policy rule is no deployment of PKOs.

Provided that the UN decides to establish a PKO, there are different potential scenarios in terms of mandate and budget – two factors that have been emphasized by previous research to have substantial consequences for the effectiveness of the mission. When it comes to mandates, this is an area in which UN PKOs have recently undergone a major change. While observer missions and traditional peacekeeping mandates used to dominate the actions of the UN, recent operations have seen more multidimensional and enforcement mandates.

Figure 4: Number and total budget of UN PKO missions by mandate type, 1970–2009

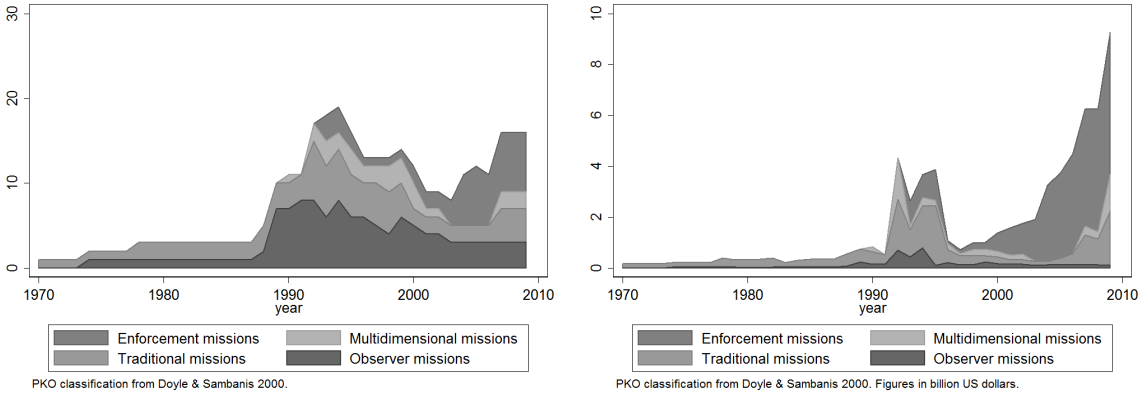
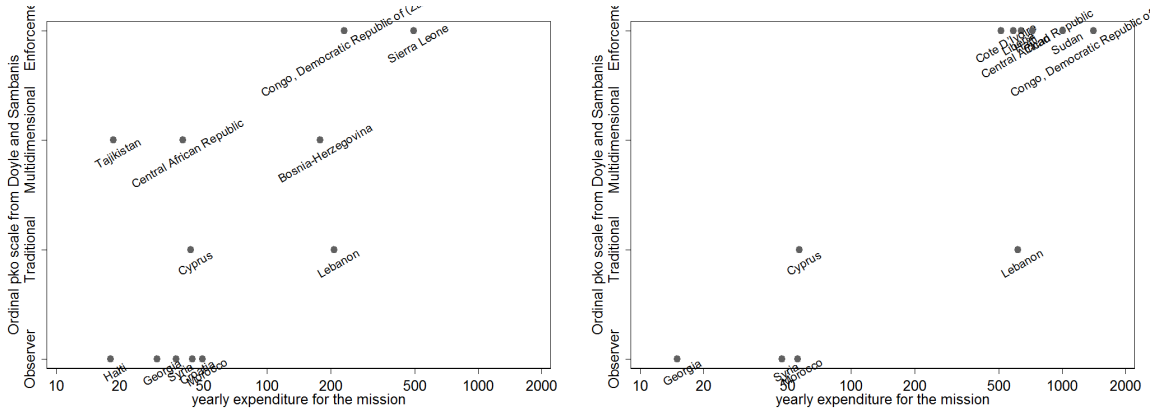


Figure 4 depicts the number of and total budgets of UN PKO missions in our dataset by mandate type. Multi-dimensional and enforcement missions were inventions of the early 1990s. Complex situations in for example the Balkans, Somalia, and Rwanda led to a surge of PKOs with more robust mandates, but the perceived failures of several such missions led to a slight decrease in UN peacekeeping initiatives (Durch and Berkman 2006). At the turn of the century, the Brahimi Report (United Nations 2000) set the agenda for the future of UN peacekeeping, and the UN again initiated a number of enforcement missions in conflict situations.

Several facts are readily apparent from Figure 4: First, both the frequency and types of PKOs changed after the end of the Cold War – in terms of frequency (left panel), the traditional and observer missions were supplemented by multidimensional and enforcement missions. The right panel clearly shows that enforcement missions account for an increasing share of the total UN PKO budget. Because of the shift in both composition and scale of PKOs after the end of the Cold War, we will mainly focus on the 1990s and 2000s in the remainder of this section.

Figure 5 shows the budgets of all PKOs active in 2000 (left figure) and 2009 (left figure). These display a tendency to provide larger budgets for missions with more robust mandates.

Figure 5: Budget of UN PKO missions by mandate type, 2000 (left) and 2009 (right)



These operations are more complex and are consequently likely to have larger budgets. In 2000, the Brahimi report emphasized the need for more robust mandates and an increase in resources (United Nations 2000). This marked a shift in both the nature of and the resources spent on peacekeeping. As shown by Figure 4, the number of peace enforcement missions have increased substantially since 2000, and as a consequence the total budget has increased dramatically in the same period.

We outline four scenarios (S1–S4) in which the UN chooses to spend different amounts on each mission, ignoring the mandates. The final four scenarios (S5–S8) vary the mandates of the PKOs, ignoring the budget of the mission.

There are of course economic constraints which sets certain limits to the number of peace-keeping operations that the UN can manage at the same time, as well as to the resources that can be allocated to these missions. In a scenario with many enforcement missions, the total amount spent on PKOs would be substantially larger than today's levels.[22] However, it seems robust mandates are here to stay. In 2006, the Secretary-General noted that 'United Nations peacekeeping succeeds or fails depending on the provision of sufficient capacity to implement a mandate' (United Nations 2006). One of the main points made in United Nations (2009) is that the UN needs to strengthen partnership with e.g. the African Union and the European Union. Parts of the budget could thus be borne by these partners in joint operations as the one in Darfur.

The eight scenarios are summarized in Table 4.

6 The simulated effect of PKOs, 2010–2035

6.1 Prediction results

Figure 6 shows the estimated proportion of countries in conflict – major conflicts only, for the baseline scenario without any future peace-keeping operations (S1). The simulations are

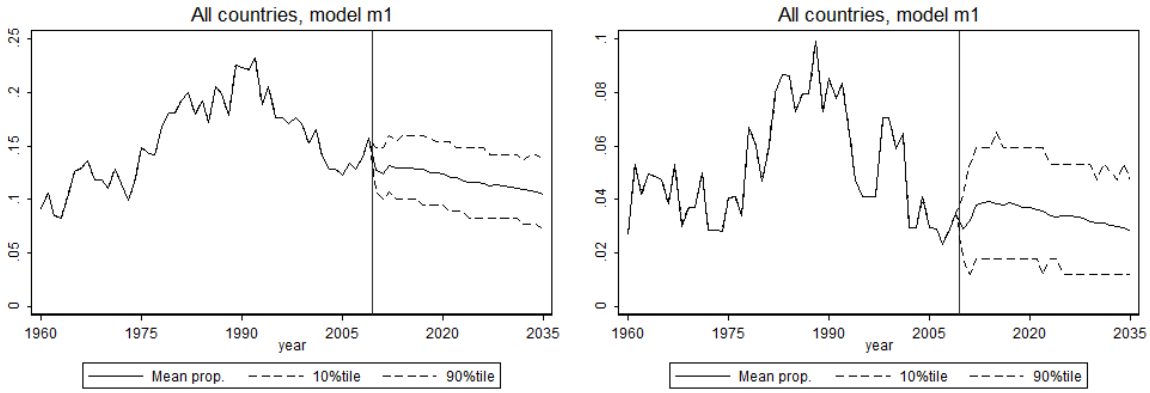
[22] Below, we estimate the most expansive policy to double UN PKO expenditures.

Table 4: Overview of PKO scenarios

Scenario	Description
1	No PKO
2	PKO, unknown mandate, budget 100 million USD per year, no large countries
3	PKO, unknown mandate, budget 800 million USD per year, no large countries
4	PKO, unknown mandate, budget 800 million USD per year, also in large countries
5	PKO, traditional mandates, unknown budget, no large countries
6	PKO, transformational mandates, unknown budget, no large countries
7	PKO, transformational mandates, unknown budget, also in large countries
8	PKO, transformational mandates, unknown budget, also in large countries, deploy in first year

based on the estimates reported in Table 2. The left panel shows the mean proportion of countries in both types of conflict and the 10th and 90th percentile over 1,000 simulations. The right panel shows the same for major conflicts only.

Figure 6: Simulation 2010–2035, No PKO scenario



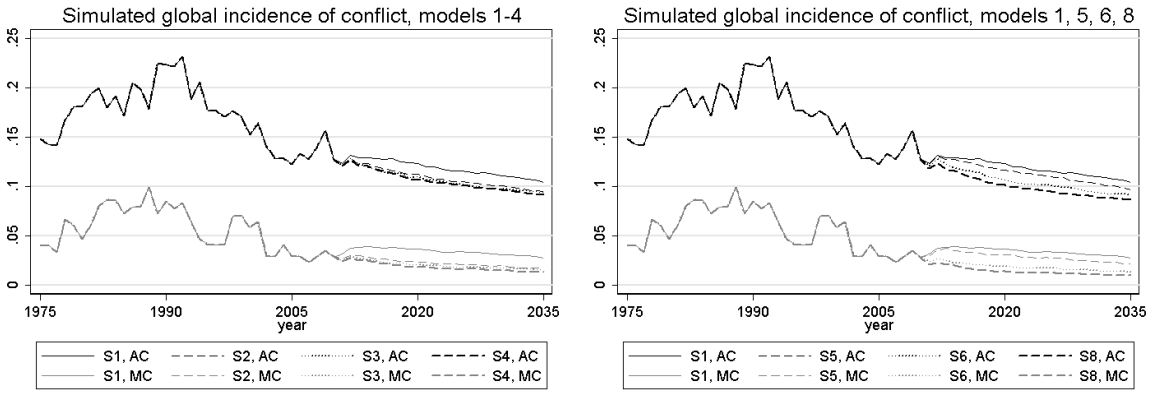
Left: All conflicts. Right: Major conflicts only.

Socio-economic development variables are important predictors of conflict, and our UN/ IIASA forecasts expect positive changes for most countries over the next 25 years. Hence, we predict a moderate decline in the proportion of countries in conflict even without any PKOs, and that the incidence of major conflict remains at the same level as the last five years.

Figure 7 compares the simulated proportion of countries in conflict in the baseline scenario with the proportion obtained in the other scenarios. In the left panel, we compare the baseline scenario with scenarios S2, S3, S4 varying the budget of missions. These simulations are based on the estimates reported in Table 2. The set of black lines represent the incidence of all armed conflicts, the gray set major conflicts only. All three scenarios imply a reduction in the incidence of conflict, although the estimated effect is not very large – the difference in the incidence of conflict is about one percentage point. We find a difference between scenarios without PKOs and those with PKOs, but beyond that there is little difference between the predictions for the various budget levels. Note that the reduction in the incidence is somewhat larger for major conflicts than for minor conflicts. This is particularly true if we look at the

proportional reduction in the incidence of major conflict. In 2035, the predicted incidence of conflict for the most extensive scenario is less than half that of the baseline scenario.

Figure 7: Simulation 2010–2035, The effect of various PKO scenarios



Left: Budget scenarios. Right: Mandate scenarios.

The right panel shows the predicted incidence of conflict varying the mandates of the PKOs. These simulations are based on the estimates reported in Table 3. As expected from the estimates in the two results tables, the effect of varying mandates is stronger than of varying budget. The predicted reduction in the incidence of both levels of conflict is about 2%, and the reduction in the incidence of major conflict is about the same. This means that the most extensive scenario reduces the risk of major conflict in 2035 with about two thirds.

Note that the incidence of minor conflict – the difference between the black and gray lines in Figure 7 – is not reduced by any large extent. Our simulations indicate that the indirect effect of PKOs on minor conflict is weak. However, it is not so that PKOs merely reduce the intensity of conflict without increasing the chance of peace. If that was the case, the incidence of both levels of conflict would not be reduced in any of the scenarios. Our simulations imply that for every successful transition from major to minor conflict due to the presence of a PKO, there is one transition from minor conflict to no conflict. In sum, these results imply that UN PKO policy matters significantly, and that the UNSC has the power to substantively enhance global security.

Our model allows for capturing long-term and spatial effects of conflict. The estimates for the 'log time in status' variables indicate that the probability of no conflict increase strongly with several consecutive years of peace, and decrease with several consecutive years of conflict. Likewise, conflicts in neighboring countries increase the risk that conflicts erupt. Given that we find that PKOs have a clear short-term effect, we might expect the difference between scenarios to increase over time. There are indications that this is the case. The difference for the overall incidence of conflict between the the no-PKO and PKO scenarios in Figure 7 clearly widen from the first year of simulation up to 2020. After the initial 10 years, the lines are roughly parallell. The lines become parallell considerably earlier for the incidence of major

Table 5: List of regions

Number	Region Name
1	South America, Central America, and the Caribbean
2	Western and Southern Europe, North America, and Oceania
3	Eastern Europe
4	Western Asia and North Africa
5	Western Africa
6	East, Central, and Southern Africa
7	South and Central Asia
8	Eastern and South-East Asia

conflict. The indirect effect over time and space is probably the reason for this difference in response over time to the various scenarios.[23]

6.2 Regional effects

We define 8 regions as listed in Table 5. The list is a condensed version of the UN region definition.[24] In Figure 8 we show simulated incidence of conflict in six of these regions, varying the mandates of the scenarios as in the right panel of Figure 7.

We also plot the observed proportion of countries in conflict for the 1995–2009 period for each region. Since there are only a handful of conflicts within each region, individual conflicts are discernible in the plots. In West Africa, for instance, there were no major conflicts from 1995 to 1997, and one conflict in 1998–99. In the 1995–2004 period the total number of conflicts fluctuated between 2 and 4. In the prediction part of the figure for the West Africa region, 10% of the countries are predicted to be in conflict. This, then, corresponds to about 2 conflicts every year. The expected number of major conflicts (more than 1,000 battle-related deaths) is less than 0.5 for this region.

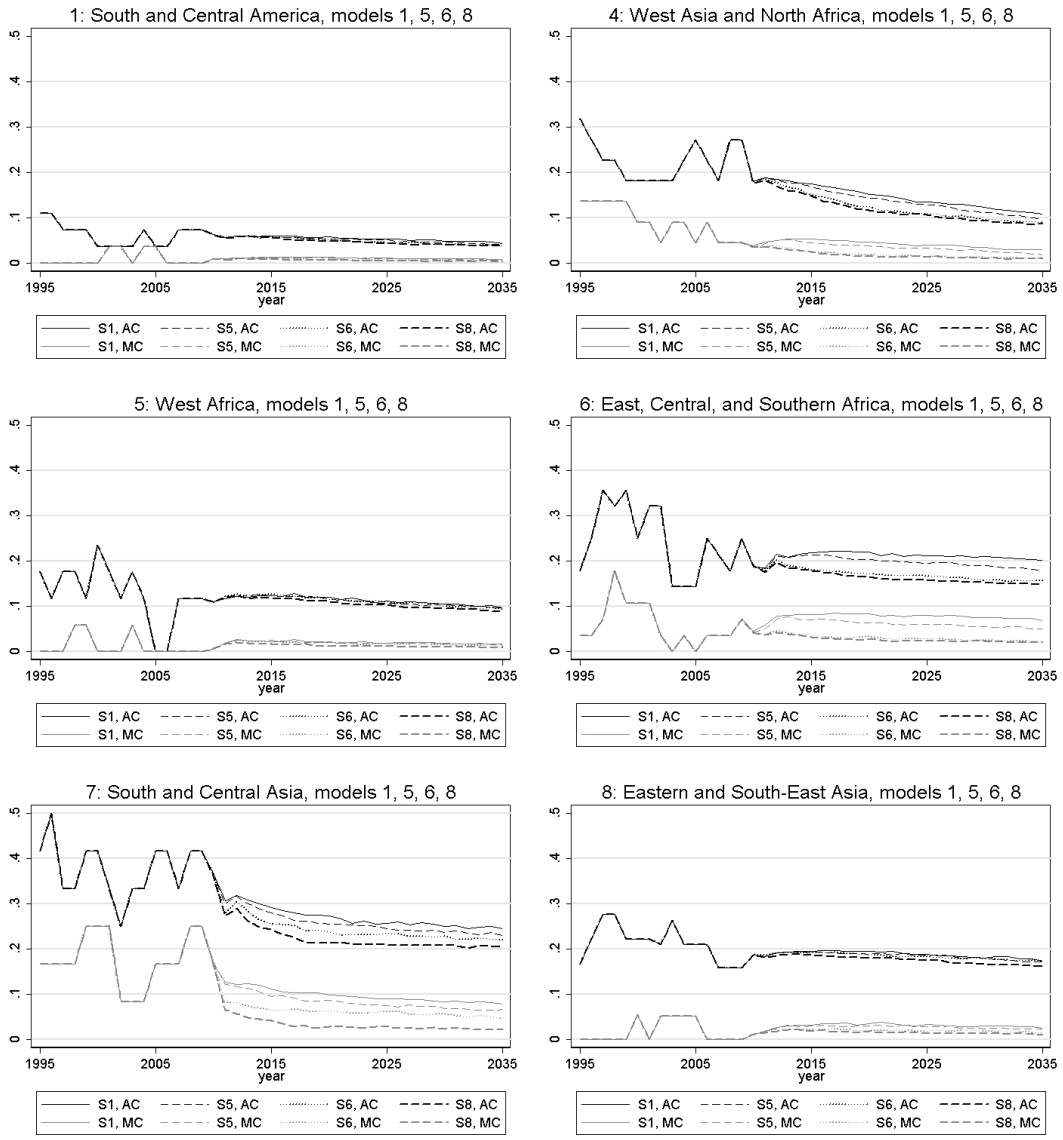
PKOs seem to have the strongest effects in 'West Asia and North Africa', 'East, Central, and Southern Africa' and 'South and Central Asia' (regions 4, 6, and 7). Since the other three regions have had few major conflicts in the post-Cold war period, the model predicts a continued low incidence of these conflicts. Since PKOs in our scenarios are initiated only in major conflicts, we consequently predict fewer deployments in these regions, and they therefore only marginally affect the regional incidence of conflict.

In the other three regions, however, PKOs substantially reduce the number of conflicts. In the 'West Asia and North Africa' region, we predict a clear decline in the incidence of conflict because of the relatively high levels of socio-economic development in the region. Particularly in the first 15 years of the simulation, PKOs with strong mandates would according to our model reinforce this declining trend. Since there are few large countries in the region, there

[23]The gradual widening of the difference between PKO and no-PKO scenarios is also due to a gradual readjustment to a new steady-state equilibrium for the incidence of conflict in a probabilistic model, so it is not straightforward to quantify the long-term effect of PKOs in this manner.

[24]The UN list is found at http://www.un.org/depts/dhl/maplib/worldregions.htm.

Figure 8: Simulation 2010–2035, both conflict levels. Varying mandates, six regions



is little difference between S6 and S8 for this region.

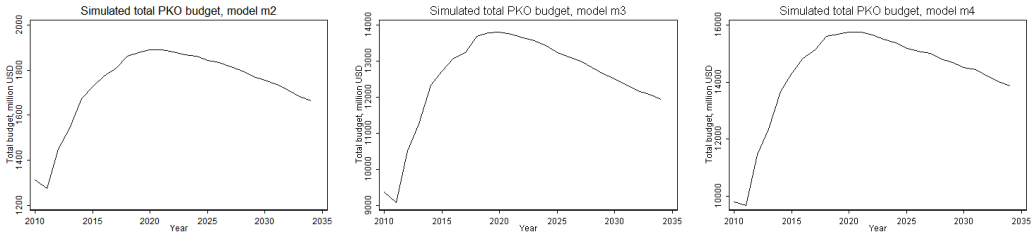
The 'East, Central, and Southern Africa' and 'South and Central Asia' regions are the ones with the highest incidence of conflict in the post-Cold War period, and also in our predictions. In 'East, Central, and Southern Africa', the strong mandate scenario (S6) reduces the predicted incidence of major conflict from about 8% of the countries to about 3%, corresponding to more than two conflicts every year to less than one. In 'South and Central Asia', the predicted incidence of conflict is about 11–12% in 2015 and slowly decreasing under the baseline no-PKO scenario. Scenario S6, with enforcement mandates for all conflicts in smaller countries, reduces the predicted incidence to about 7%. Scenario S8, which allows for PKOs in large countries (but not in the permanent members of the UNSC) and deployment in the

first year of a major conflict reduces the incidence by another couple of percents. If Gilligan and Stedman (2003) are correct that the UN is less inclined to intervene in Asian conflicts, the UNSC has strong reasons to reconsider this policy. The potential effect of PKOs is strong in this area, and a policy shift would substantially decrease the incidence of armed conflict.

6.3 Budget effects

As noted earlier, the high-commitment scenarios are costly. We are therefore interested in assessing how much the UN budget would increase in our various scenarios. Figure 9 shows the average simulated total budgets for UN PKOs under scenarios S2, S3, and S4. The low-budget scenario (S2) would imply a strong reduction in UN peace-keeping expenditures, whereas the other two scenarios represent an increase in total annual expenditures of 50–70% compared to what the UN spent in 2009. These are significant increases in expenditures, especially since the UN is already struggling to get the funds and the troop commitments required to carry out the current missions. Nevertheless, would the member states of the UN be willing to increase their support for PKOs, there is much to be gained – not only in terms of global security, but also in terms of development and economic growth. Gates et al. (2012) show the detrimental effects of armed conflict on development. According to their analysis, a major armed conflict with 2500 battle deaths – i.e. those conflicts that PKOs are particularly good at reducing – increases undernourishment by 3.3 percent and infant mortality by 10 percent. deGroot and Brück (2012) find that the world would have seen a 16 percent larger global GDP in the absence of war in the last five decades. They particularly emphasize the economic gains to be made by ending wars earlier, which is what PKOs are well designed to do according to our analysis. Considering the enormous negative externalities of armed conflict, an increase in the UN PKO budget by 50 percent may be a relatively cheap way of investing in future global security and development.

Figure 9: Simulated total UN PKO budgets, 2010–2035



7 Conclusion

In this paper we have evaluated the prospects of PKOs in reducing conflict in the future. By simulating different scenarios, we have estimated the effect on the future incidence of conflict of different types of missions and of varying the money spent on PKOs. The results show that

PKOs have a clear conflict-reducing effect. The effect of PKOs is largely limited to preventing major armed conflicts. However, there is a discernible indirect effect since the reduction of conflict intensity also tends to increase the chances of peace in following years. There are also some interesting regional differences. PKOs have the strongest effect in three regions: West Asia and North Africa; East, Central, and Southern Africa; South and Central Asia. This reflects that these regions have had more major conflicts compared to other regions.

These findings have some clear policy implications, since they illustrate the effect of different PKO policies. In one of the most extensive scenarios, in which major armed conflicts are met with a PKO with an annual budget of 800 million USD, the total UN peacekeeping budget is estimated to increase by 50–70 percent. However, in this scenario, the risk of major armed conflict is reduced by half relative to a scenario without any PKO. This indicates that a large UN peacekeeping budget is money well spent. Moreover, the total PKO budget would increase for about ten years, and then start decreasing again as a result of a reduced number of conflicts in the world. In another scenario, which specifies that major conflicts get a PKO with a transformational mandate in the first year, the risk of conflict is reduced by two-thirds in 2035 compared to a scenario without any PKO. If the UN is serious about maintaining international peace and security, it is important to consider the impact of different policies regarding mandates and budgets, as well as the reaction-time from a conflict outbreak to the deployment of a mission.

The methodology used here opens up for new interesting questions and possible extensions to the research presented. One pertinent question is whether the quality of PKOs may not be equally important for its efficiency as the mandate and the budget. Troop-contributing countries have varying levels of military training and a large number of countries contributing troops to a single mission may introduce coordination problems. Another relevant issue is the impact of regional security actors. In this paper we have evaluated the effect of UN PKOs, but the UN is not the only actor doing peacekeeping. For example, the African Union and NATO have been involved in several conflict and post-conflict situations. Therefore it would be interesting to assess whether these actors differ in their peacekeeping efficacy, and subsequently simulate a future scenario that takes into account the increasing involvement of regional actors in peacekeeping. The simulation procedure used here offers a useful tool for evaluating the practical relevance of theoretical insights as well as assessing the impact of different policies.

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A Appendix

A.1 When do they go? Exploring potential endogeneity

Several studies have looked at whether PKOs are subject to a selection effect such that they are sent to the 'easy' conflicts. So far there is little or no evidence that would support such a claim (**?**Gilligan and Sergenti 2008; Gilligan and Stedman 2003). Being sent to particularly intense conflicts would, however, not be the only way a selection effect could influence the estimated efficiency of PKOs. Another possible mechanism would be one were peacekeepers are sent to conflicts after the conflicts have passed their intensity peak. PKOs would then be deployed only when the 'moment is ripe' (Zartman 2001) and conflicts would nevertheless have deescalated without the intervention. If so, it is untenable to attribute any causal effect of the PKO – it would simply signal the beginning of the end.

Table A-1: Onset of PKOs across 'conflict trajectory', 1970–2009

	ds_onstri							
conflicttrajectory	No PKO		Traditional		Transformational		Total	
	No.	%	No.	%	No.	%	No.	%
-5	3	75.0%	1	25.0%	0	0.0%	4	100.0%
-4	18	100.0%	0	0.0%	0	0.0%	18	100.0%
-3	22	88.0%	1	4.0%	2	8.0%	25	100.0%
-2	83	97.6%	1	1.2%	1	1.2%	85	100.0%
-1	101	96.2%	1	1.0%	3	2.9%	105	100.0%
0	712	97.9%	11	1.5%	4	0.6%	727	100.0%
1	84	96.6%	2	2.3%	1	1.1%	87	100.0%
2	75	96.2%	1	1.3%	2	2.6%	78	100.0%
3	13	100.0%	0	0.0%	0	0.0%	13	100.0%
4	22	100.0%	0	0.0%	0	0.0%	22	100.0%
5	4	100.0%	0	0.0%	0	0.0%	4	100.0%
Total	1,137	97.3%	18	1.5%	13	1.1%	1,168	100.0%

We investigate this claim in two ways and find little evidence in its favor. First we construct a five-category conflict variable that distinguishes between five levels of battle deaths incurred in a given year.[25] From this, we create an 11-category 'conflict trajectory' variable. This variable tracks the escalatory process of conflicts by comparing the conflict level at t with the level at $t-1$. A conflict which stays at the same level scores 0 on this variable. A conflict which escalates gets a positive score, and a conflict which de-escalates a negative score. Table A-1 tabulates conflict trajectory against onset of PKOs for all country years in conflict or within three years after the end of a conflict. The column to the right shows the total number of conflict years. These have an approximately normal distribution across the trajectory categories. The second and third columns reports the distribution of PKO onsets across the conflict trajectory categories. There is only slight evidence for the hypothesis that PKOs are deployed as the conflict is winding down. Half of the 31 PKO onsets were deployed in years where the intensity level was the same as the preceding years, and 27 of the deployments happened in years when the conflict trajectory was between –2 and 2. Only four cases break

[25]The five categories are: 0–99, 100–499, 500–999, 1000–9999, 10,000–max. Data on annual battle deaths come from the UCDP Battle Deaths Dataset (UCDP 2012).

this symmetric patterns: The operations in Cambodia (1992), El Salvador (1993), Lebanon (1978), and Morocco (1991) were initiated following a noticeable decrease in conflict intensity.

Next, we conduct an instrumental variable analysis. We utilize exogenous variation in the number of PKOs which are deployed to estimate the peace-building effects of these PKOs. Figure 4 clearly shows that the world saw many more PKOs in the period from 1989 to 1995, and then again after 2000. The end of the Cold War opened up for a massive expansion of UN peacekeeping activities, but enthusiasm dropped abruptly after the failures in Bosnia in 1995 and Somalia in 1993. UN PKO engagements then gradually re-expanded from 2000 onwards. This temporal variation is not a function of the 'demand' for them – the number of conflicts declined gradually from 1992 until 2009.[26] In fact, the number of major armed conflict surged in the 1998–2001 period, implying that the proportion of major conflicts with a PKO was even lower than what appears from Figure 4. We use these time periods, in combination with information on whether a conflict was going on in a country the previous year, as an instrumental variable for PKO deployment. In addition, we use variables recording whether the country was one of the five permanent members in the UN security council or an ally of any of these.[27]

Instruments must satisfy two criteria: relevance and exclusion (Kennedy 2008; Greene 2003). Our instrument variables are relevant since they are highly correlated with the deployment of PKOs (see Table A-3). As argued above, they are exogenous, therefore also satisfy the exclusion criteria. We run a two-stage least squares (2SLS) model with this instrument in the first stage of the model and the incidence of major conflict as the dependent variable.[28] We include the same control variables as in the analysis in the next section. The results of the estimation are shown in Table A-2. In addition to the instrument we include the set of covariates discussed above. The results from the first-stage estimation is reported to the right, those from the second stage to the left. The first-stage results show that two of the three instrument variables have a significant effect on the onset of PKOs.

In the second stage, the instrumented PKO variable has a negative and significant effect on the incidence of major conflict. The magnitude of the estimate is fairly large for a relatively imprecise instrumented variable – the difference between country-years with high and low probabilities of PKO onset is about 0.2. This difference translates into more than 50% reduction in the probability of major conflict. The Wald test for exogenity however is not significant, indicating that the original variable is not really endogenous and that it is 'safe' to conduct classical inferences (Wooldridge 2010, 472–77). All in all, we conclude that endogenity is a minor problem for our analysis, and proceed to analyzing the impact of different scenarios for PKO involvement.

A.2 Where do peacekeepers go?

Table A-3 shows the results from estimating a multinomial regression model with a simplified version of the categorical Doyle-Sambanis mandate variable as the dependent variable. As

[26] See Harbom and Wallensteen (2010, p. 502) and Figure 6.

[27] The five permanent members are the UK, France, China, Russia, and the US. Alliance data were taken from Gibler and Sarkees (2004).

[28] We restrict attention to the effect on major conflicts given what we find in Table 3 – PKOs are effective in reducing the intensity of conflict, not in preventing them. We also ran a two-stage probit model given that the dependent variable is dichotomous. This yielded substantively the same results, but in the second stage the instrumented variable was only borderline significant. We rely on the linear 2SLS model even though we have a dichotomous variable, since the instrumental probit model is less efficient and produces larger standard errors (Greene 2003).

Table A-2: When do they come: Instrumental variable regression

	(1) conflict2		(2) pko_cat	
PKO Instrumented	-0.385***	(-3.88)		
Instrument, 90-95 + 00–			0.114***	(8.20)
Instrument P5 Country			0.0411	(0.94)
Instrument P5 Allied			0.0322	(1.96)
Minor Conflict, t-1	-0.235*	(-2.22)	0.00518	(0.04)
Major Conflict, t-1	0.135	(0.71)	0.229	(1.06)
Time in Peace	-0.0441***	(-7.18)	-0.0156*	(-2.30)
Time in Conflict	-0.0601***	(-7.20)	-0.0264**	(-3.08)
Time in War	0.217***	(18.00)	-0.0392**	(-3.07)
Infant Mortality	0.0359*	(2.57)	0.00696	(0.44)
IMR * minor conflict at t-1	0.0127	(0.54)	0.0799**	(3.15)
IMR * major conflict at t-1	-0.0138	(-0.42)	0.136***	(4.01)
IMR * time in statys c0	-0.0144**	(-3.01)	-0.0139**	(-2.66)
Youth Bulges	-0.00649***	(-3.83)	-0.00315	(-1.66)
Youth * minor conflict at t-1	0.00759**	(2.82)	-0.00129	(-0.39)
Youth * major conflict at t-1	0.0104**	(2.59)	-0.00112	(-0.24)
Youth * time in status c0	0.00239***	(4.01)	0.00185**	(2.86)
Population	0.000857	(0.21)	0.00120	(0.25)
Population * minor conflict at t-1	-0.00285	(-0.35)	-0.0498***	(-6.55)
Population * major conflict at t-1	-0.000655	(-0.05)	-0.0804***	(-7.33)
Population * time in status c0	-0.000298	(-0.21)	-0.00242	(-1.55)
Education	-0.0642	(-1.89)	-0.0552	(-1.44)
Education * minor conflict at t-1	0.192**	(2.92)	0.193**	(2.75)
Education * major conflict at t-1	-0.172*	(-2.02)	0.239*	(2.57)
Education * time in status c0	0.0114	(1.07)	-0.0182	(-1.52)
Neihborhood IMR	0.00406	(0.53)	0.0128	(1.48)
Neihborhood Education	0.0360	(1.25)	0.130***	(4.61)
NC * minor conflict at t-1	0.0279***	(3.99)	0.0164*	(2.11)
NC * major conflict at t-1	-0.0308	(-1.58)	-0.101***	(-5.40)
NC * time in status c0	-0.00517*	(-2.10)	0.00484	(1.73)
Eastern Europe	-0.00325	(-0.32)	-0.00674	(-0.58)
Western Africa	-0.0385***	(-3.74)	-0.0316**	(-2.75)
Rest of SS Africa	-0.0260**	(-2.84)	-0.0690***	(-9.26)
_cons	0.138**	(3.08)	0.121*	(2.43)
ll			957.0	
aic	.		-1847.9	
N	5946		5946	

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

explained in Section 3, we have merged the 'observer' and 'traditional' categories into a new 'traditional operation' category, and the 'multidimensional' and 'enforcement' categories into 'transformational operations'. The model is estimated only for the post-1989 period, and only for country years where the country is either in conflict or has had a conflict within the last 10 years. We have excluded the permanent members of the UNSC from the data set used here, since these countries are very likely to veto PKOs in own internal conflicts.

Model 1 – onset – is restricted to PKO onsets, i.e. conflict/post-conflict country years where a peace-keeping operation continued from the previous with the same mandate have ben removed from the data set. Model 2 – incidence – includes all conflict/post-conflict country years for the 1990–2009 period.

As noted by previous studies, it is difficult to identify circumstances in which conflict

Table A-3: Where do they go: Determinants of peace-keeping operations, 1990–2009

	(1) Onset		(2) Incidence	
	Traditional	Transformational	Traditional	Transformational
Traditional operation t–1	0	4.733***	6.168***	4.676***
	(.)	(6.90)	(13.77)	(7.59)
Transformational operation t–1	3.028***	0	2.726**	6.878***
	(3.30)	(.)	(3.17)	(11.79)
Major conflict t	1.882*	1.600*	1.232	1.932**
	(2.38)	(2.00)	(1.78)	(2.85)
Minor conflict t–1	0.286	1.080	0.0936	-0.700
	(0.38)	(1.43)	(0.14)	(-1.05)
Major conflict t–1	-0.0883	-0.547	-0.610	-1.536
	(-0.09)	(-0.47)	(-0.65)	(-1.65)
Post-conflict year 1–3	0.509	0.182	0.0138	-0.739
	(0.56)	(0.19)	(0.02)	(-0.99)
Post-conflict year 4–6			-0.293	-1.898*
			(-0.37)	(-2.36)
Post-conflict year 7–10			-0.326	-3.741**
			(-0.43)	(-2.75)
Log population	-0.387	-0.494	-0.295	-0.391
	(-1.81)	(-1.92)	(-1.70)	(-1.83)
Log infant mortality rate	0.0611	0.515	-0.126	0.250
	(0.17)	(1.38)	(-0.52)	(0.96)
1990s	21.56***	-0.819	0.982*	-0.754
	(9.08)	(-1.35)	(2.25)	(-1.69)
_cons	-22.49	-2.531	-1.693	-1.031
	(.)	(-0.89)	(-0.86)	(-0.45)
N	1002		1152	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Unit of observation: Country years at conflict or in post-conflict state (less than 10 years after end of conflict).

countries will receive PKOs, but Model 1 give some indications. First, both traditional and transformational PKOs are about six times more likely to be initiated in countries with major conflict (more than 1,000 battle deaths) than in conflicts that are less intense or just have ended. The UN occasionally starts up PKOs in countries that have had up to three years after conflict, but almost never after that.[29] There is some indication that conflicts that have lasted a year or more have a larger probability of attracting PKOs.

Secondly, PKOs are less frequent in large countries. This is particularly true for transformational operations. The odds of PKO initiation in a country with 10 million inhabitants is more than three times higher than in a country with 100 million inhabitants. This is also evident from the list of all PKOs (Table A-4).

Thirdly, transformational PKOs are more likely in under-developed countries, but the relationship is not very strong. A conflict country with an infant mortality rate at 100 (per 1,000 live births) is about twice as likely to receive PKOs as one with 20.

Finally, traditional operations often initiate after transformational ones, and vice versa. Moreover, as evident from Figure 4, traditional PKOs were more frequent in the 1990s than in the 2000s, whereas transformational operations became more numerous in the most recent

[29] Estimates for the coefficients for 'Post-conflict year 4–6/7–10' are typically smaller than –30, reflecting the almost perfect absence of such cases. Given the estimation problems associated with such relationships we opted not to present these results.

decade.

Model 2 – incidence – complements this picture by showing that PKOs also tend to continue if the conflict remains at the major conflict level. The probability of continuation decreases quickly over the post-conflict period.

A.3 List of peace-keeping operations

Table A-4: List of United Nations peace-keeping operations, 1970–2009

Acronym	Mission name	Start date	Closing date	Countries
Observer missions				
UNDOF	United Nations Disengagement Observer Force	Jun-74	Present	Syria
UNAVEM I	United Nations Angola Verification Mission I	Jan-89	Jun-91	Angola
ONUCA	United Nations Observer Group in Central America	Nov-89	Jan-92	Costa Rica, El Salvador, Guatemala, Honduras
MINURSO	United Nations Mission for the Referendum in Western Sahara	Apr-91	present	Morocco (Western Sahara)
UNAMIC	United Nations Advance Mission in Cambodia	Oct-91	Mar-92	Cambodia
UNOMUR	United Nations Observer Mission Uganda-Rwanda	Jun-93	Sep-94	Rwanda, Uganda
UNOMIG	United Nations Observer Mission in Georgia	Aug-93	Jun-09	Georgia
UNOMIL	United Nations Observer Mission in Liberia	Sep-93	Sep-97	Liberia
UNASOG	United Nations Aouzou Strip Observer Group	May-94	Jun-94	Chad
UNMOT	United Nations Mission of Observers in Tajikistan	Dec-94	May-00	Tajikistan
UNMOP	United Nations Mission of Observers in Prevlaka	Jan-96	Dec-02	Croatia, Federal Republic of Yugoslavia
MIPONUH	United Nations Civilian Police Mission in Haiti	Dec-97	Mar-00	Haiti
UNPSG	UN Civilian Police Support Group	Jan-98	Oct-98	Croatia
Traditional missions				
UNFICYP	United Nations Peacekeeping Force in Cyprus	Mar-64	Present	Cyprus
UNIFIL	United Nations Interim Force in Lebanon	Mar-78	Present	Lebanon
UNGOMAP[30]	United Nations Good Offices Mission in Afghanistan and Pakistan	May-88	Mar-90	Afghanistan, Pakistan
UNAVEM II	United Nations Angola Verification Mission II	Jun-91	Feb-95	Angola
UNOSOM I	United Nations Operation in Somalia I	Apr-92	Mar-93	Somalia
UNAMIR	United Nations Assistance Mission for Rwanda	Oct-93	Mar-96	Rwanda
UNAVEM III	United Nations Angola Verification Mission III	Feb-95	Jun-97	Angola
UNPREDEP	United Nations Preventive Deployment Force	Mar-95	Feb-99	Macedonia
UNCRO	United Nations Confidence Restoration Operation in Croatia	May-95	Jan-96	Croatia
UNSMIH	United Nations Support Mission in Haiti	Jul-96	Jul-97	Haiti
MINUGUA	United Nations Verification Mission in Guatemala	Jan-97	May-97	Guatemala
MONUA	United Nations Observer Mission in Angola	Jun-97	Feb-99	Angola
UNTMIH	United Nations Transition Mission in Haiti	Aug-97	Dec-97	Haiti
UNOMSIL	United Nations Observer Mission in Sierra Leone	Jul-98	Oct-99	Sierra Leone

[30]UNGOMAP is coded as active only in Afghanistan

Multi-dimensional missions				
UNTAG	United Nations Transition Assistance Group	Apr-89	Mar-90	Namibia
ONUSAL	United Nations Observer Mission in El Salvador	Jul-91	Apr-95	El Salvador
UNTAC	United Nations Transitional Authority in Cambodia	Mar-92	Sep-93	Cambodia
ONUMOZ	United Nations Operation in Mozambique	Dec-92	Dec-94	Mozambique
UNMIBH	United Nations Mission in Bosnia and Herzegovina	Dec-95	Dec-02	Bosnia & Herzegovina
MINURCA	United Nations Mission in the Central African Republic	Apr-98	Feb-00	Central African Republic
UNMISET	United Nations Mission of Support in East Timor	May-02	May-05	Timor-Leste
UNMIT	United Nations Integrated Mission in Timor-Leste	Aug-06	Present	Timor-Leste
Enforcement missions				
UNPROFOR	United Nations Protection Force	Feb-92	Mar-95	Croatia, Bosnia & Herzegovina, Macedonia
UNOSOM II	United Nations Operation in Somalia II	Mar-93	Mar-95	Somalia
UNMIH	United Nations Mission in Haiti	Sep-93	Jun-96	Haiti
UNTAES	United Nations Transitional Administration for Eastern Slavonia, Baranja and Western Sirmium	Jan-96	Jan-98	Croatia
UNMIK	United Nations Interim Administration Mission in Kosovo	Jun-99	Present	Kosovo
UNTAET	United Nations Transitional Administration in East Timor	Oct-99	May-02	Timor-Leste
UNAMSIL	United Nations Mission in Sierra Leone	Oct-99	Dec-05	Sierra Leone
MONUC	United Nations Organization Mission in the Democratic Republic of the Congo	Nov-99	Present	Democratic Republic of Congo
UNMIL	United Nations Mission in Liberia	Sep-03	Present	Liberia
UNOCI	United Nations Operation in Côte d'Ivoire	Apr-04	Present	Cote d'Ivoire
MINUSTAH	United Nations Stabilization Mission in Haiti	Jun-04	Present	Haiti
ONUB	United Nations Operation in Burundi	Jun-04	Dec-06	Burundi
UNMIS	United Nations Mission in the Sudan	Mar-05	Present	Sudan
UNAMID	African Union-United Nations Hybrid Operation in Darfur	Jul-07	Present	Sudan
MINURCAT	United Nations Mission in the Central African Republic and Chad	Sep-07	Present	Central African Republic, Chad
Missions associated with international conflicts that are excluded from our analysis				
UNEF II	Second United Nations Emergency Force	Oct-73	Jul-79	Egypt
UNIIMOG	United Nations Iran-Iraq Military Observer Group	Aug-88	Feb-91	Iran, Iraq
UNIKOM	United Nations Iraq-Kuwait Observation Mission	Apr-91	Oct-03	Iraq, Kuwait
UNMEE	United Nations Mission in Ethiopia and Eritrea	Jul-00	Jul-08	Ethiopia, Eritrea

A.4 Additional estimation tables

Table A-5: Estimation results, determinants of conflict, baseline model without PKO variables

	1		2	
Log PKO expenditures				
Log expenditures squared				
Traditional PKO				
Transformational PKO				
Minor conflict t-1	2.441	(1.32)	3.043	(0.98)
Major conflict t-1	0.100	(0.03)	4.098	(1.02)
Log time in status c0	-1.240***	(-14.72)	-1.573***	(-9.81)
Log time in status c1	1.146***	(9.97)	0	(.)
Log time in status c2	0	(.)	1.260***	(7.41)
Conflict in neighborhood	0.649**	(2.88)	0.803	(1.67)
NC * minor conflict at t-1	-0.613*	(-2.32)	-0.612	(-1.18)
NC * major conflict at t-1	-1.297***	(-3.37)	-1.219*	(-2.13)
NC * time in status c0	-0.133	(-1.40)	-0.214	(-1.02)
Log population	0.346***	(3.50)	0.212	(1.21)
Population * minor conflict at t-1	-0.00127	(-0.01)	0.199	(0.98)
Population * major conflict at t-1	-0.0350	(-0.18)	0.160	(0.67)
Population * time in status c0	-0.0485	(-1.18)	0.0638	(0.79)
Log infant mortality rate	0.0131	(0.04)	1.979**	(3.01)
IMR * minor conflict at t-1	-0.247	(-0.61)	-1.820*	(-2.48)
IMR * major conflict at t-1	-0.197	(-0.37)	-2.050**	(-2.60)
IMR * time in status c0	0.265*	(2.00)	-0.293	(-1.07)
Youth bulge	0.00915	(0.24)	-0.146*	(-1.96)
Youth * minor conflict at t-1	0.00109	(0.02)	0.176*	(2.09)
Youth * major conflict at t-1	0.105	(1.44)	0.246*	(2.52)
Education	-1.661*	(-1.99)	1.172	(0.94)
Education * minor conflict at t-1	-0.0122	(-0.01)	-1.477	(-0.99)
Education * major conflict at t-1	2.391	(1.61)	-1.856	(-1.06)
Education * time in status c0	0.445	(1.36)	-0.247	(-0.42)
Log IMR in neighborhood	-0.294	(-1.37)	-0.0996	(-0.33)
Education in neighborhood	-0.497	(-0.82)	-0.934	(-1.08)
loi	0	(.)	0	(.)
loic1	0	(.)	0	(.)
loic2	0	(.)	0	(.)
lois0	0	(.)	0	(.)
Youth * time in status c0	-0.00783	(-0.47)	0.0461	(1.35)
Eastern Europe	-0.423	(-1.14)	0.298	(0.54)
Western Africa	-0.144	(-0.59)	-1.884***	(-3.49)
Rest of SS Africa	0.0742	(0.45)	-0.0652	(-0.28)
Constant	-3.327*	(-2.53)	-8.551***	(-3.32)
N	5942			
ll	-1525.0			

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$