

## **Post-Conflict Risks**

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## Executive Summary

Post-conflict societies face two distinctive challenges: economic recovery and risk reduction. Aid and policy reforms have been found to be highly effective in economic recovery. In this paper we concentrate on the other challenge, risk reduction. The post-conflict peace is typically fragile: the typical country faces around a 40% risk of reversion to conflict during the first decade of peace. As a result, nearly half of all civil wars are due to post-conflict relapses. Both external actors and the post-conflict government therefore rightly give priority to reducing the risk of conflict.

We compare political, economic and military aspects of the post-conflict situation to address the problem of high risk. Our results are based on a statistical analysis of 74 post-conflict experiences from around the world, this being as comprehensive a coverage as is currently possible. Statistical analysis is obviously not a substitute for knowledge of particular contexts, but it can be a useful supplement to such knowledge.

The results on political design and interventions are disappointing. Post-conflict elections *shift* the risk between years. Specifically, an election reduces risk substantially in the year of the election, but increases it even more substantially in the year following the election. Thus, the net effect is not risk-reducing. The lull in the year prior to the election is a misleading signal. Hence, elections are likely to be the wrong milestone for troop withdrawals. Similarly, while democratic constitutions are desirable in themselves, they do not appear to reduce risks.

Economic development does substantially reduce risks. Both growth and the higher levels of income that growth cumulatively delivers, bring risks down. Economic policy reform has no adverse systematic direct effect on risks, so that there should be some presumption that reforms that are conducive to growth are risk-reducing. Obviously, this is not a license for cavalier economic change, but since post-conflict countries typically start with poor economic policies there is a strong case for giving economic reform priority.

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While economic growth reduces risks, its effects take time: typically a decade. Hence, there is a need for an interim strategy for risk containment. Left to themselves, post-conflict governments recognize high risks and opt for continuing high military spending: they seldom take a peace dividend. Unfortunately, uniquely in post-conflict situations, high government military spending is counter-productive, significantly increasing the risk of further conflict. The only remaining option is therefore external peacekeeping forces.

We find that external UN military peacekeeping significantly and substantially brings risks down. Our results are consistent with peacekeepers being deployed in contexts which are inherently more risky, but that the more resources that are spent on peacekeeping in these environments the safer they become. The effect is large: in the typical country doubling expenditure would reduce the risk over the course of the decade from 40% to 31%.

Based on these results we suggest that a useful rule-of-thumb is that international efforts need to focus on a '*politics +*' strategy rather than a '*politics alone*' strategy. The '+' would be long term economic development through substantial aid and rapid reform, combined with a commitment to the provision of security through external peacekeepers throughout the first post-conflict decade. The two approaches are complements. Without security the post-conflict situation is liable to be seen as too precarious to induce the investment necessary for economic development. Without economic development, there is no safe exit strategy for international peacekeepers.

Finally, post-conflict risks are substantially higher the lower is per capita income at the outset of the peace. This provides a clear and uncontroversial principle for resource allocation: resources per capita should be approximately inversely proportional to the level of income in the post-conflict country. To date, the allocation of economic and military resources between post-conflict situations has diverged quite radically from this simple principle.

## 1. Introduction

Post-conflict societies face two distinctive challenges: economic recovery and risk reduction. Conflict will usually have severely damaged the economy. Supporting the recovery was the founding objective of the World Bank, and both aid and policy reforms have been found to be highly effective in the post-conflict context (Collier and Hoeffler, 2004). In this paper we study the other challenge, risk reduction. The post-conflict peace is typically fragile: around half of all civil wars are due to post-conflict relapses (Collier *et al.* 2003). Both external actors and the post-conflict government must therefore give priority to reducing the risk of conflict. The two objectives of economic recovery and risk reduction are likely to be complementary: economic recovery may reduce risks, and risk reduction may speed recovery. However, this complementarity between objectives does not imply coincidence of instruments: the instruments that are effective for risk reduction may be quite distinct from those for economic recovery.

Although there is now a large case study literature on post-conflict situations, there are few quantitative comparative studies of post-conflict risks. Indeed, until recently there were insufficient data to support such a study. Our approach is to estimate hazard functions on a comprehensive sample of post-conflict situations. In Section 2 we discuss the hypotheses that underpin current international practice in post-conflict situations. These hypotheses are not explicitly derived from political or economic theory, but rather have emerged over the past 15 years of practitioner experience. We suggest that to an extent they contrast with theory-based hypotheses. In Section 3 we discuss our methodology and our sources of data. There are various often difficult choices that must be made in building a data set of post-conflict experiences that is comprehensive, up-to-date, and satisfactorily delineated so as to exclude circumstances that do not really reflect the end of a civil war. In Section 4 we present our results, showing how the hazard of conflict reversion is affected both by the initial post-conflict characteristics and with time-varying characteristics. Section 5 concludes with a discussion of the implications for international policy.

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## 2. Post-Conflict Risks: Current Policy and Recent Research

Post-conflict policy has only arisen as a practical international concern since the end of the Cold War. Since then very substantial international resources have been devoted to post-conflict situations, often under intense media scrutiny. The predominant learning process has been practitioner-based. Because it is a recent phenomenon, academic research has taken time to address the subject, and inevitably until recently the only feasible approach was through case studies. Paris (2004) and Stedman *et al* (2003) provide a comprehensive overview of peace building during the 1990s. Only recently has an academic literature developed based on theory and quantitative analysis. We first review practitioner learning, and then turn to the academic literature.

## Current Policy Models

Until the end of the Cold War the international community was not in a position to intervene in post-conflict situations. As a consequence there was little call for analysis. With the end of the Cold War numerous opportunities for intervention rapidly arose, and this yielded a phase in which practitioners had little choice but to learn by doing. One of the conventional wisdoms that emerged from this experience was that there were enormous differences among post-conflict situations, so that any generalization was dangerous. However, the decision of the United Nations in September 2005 to establish a Peace-Building Commission reflected a growing sense that it is time to introduce a greater degree of standardization. For example, one by-product of the 'every situation is unique' doctrine was that the amount spent on peacekeeping forces has varied enormously between different post-conflict situations with little apparent relation to need. In the absence of fresh evidence, the most likely outcome is that the Peace-Building Commission will itself attempt to codify current practices. Thus, at the risk of imposing a greater commonality on practice than exists, it is useful to suggest what such a codification is likely to yield in terms of a few rules-of-thumb. At a minimum, an effort to summarize conventional wisdom into a few rules of thumb may, through inaccuracies, provoke a more authoritative succinct statement from practitioners themselves.

The first stage in the sequence of international post-conflict practice starts while the conflict is still continuing. This is to achieve a *negotiated settlement* rather than allow the conflict to drag on to the point of victory for one or other of the parties. This has been a highly successful strategy, yielding resolutions to several wars.

The second stage is a relatively *light presence of peacekeeping troops*, the typical level where such troops are provided being around \$5 per head of the population.

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The third stage is to encourage a constitution which provides for a degree of democracy. Intervention is seen essentially as *pump-priming democracy*. The degree of decentralization of power envisaged in the constitution varies. The settlement in the Sudan provides considerable autonomy for the South, but more usually it favors a fairly *unified state*.

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The fourth stage is that during its period of presence in the country international intervention should be conducted in such a way as to leave a '*light footprint*'. A key implication is to allow the pace of reform to be set by the government. This is partly due to sensitivity over issues of sovereignty, and partly due to a concern that since post-conflict situations are fragile, reform could easily be destabilizing. Most post-conflict situations commence with extremely poor levels of governance and economic policy. For example, on the World Bank's five-point rating system, the Country Policy and Institutional Assessment, the typical post-conflict country starts with a rating of only 2.41, a level far below the minimum level regarded as adequate for development (Collier and Hoeffler, 2004). Since post-conflict situations are typically characterized by power struggles, the reform of economic policy is seldom treated as a high priority by governments themselves.

The fifth stage is to gain acceptance for the settlement through *post-conflict elections*. Elections are seen as legitimating both the settlement itself and the authority of the government and so help to reduce tensions.

The sixth stage is the *withdrawal of international peacekeeping troops*. Sometimes the election is treated as the milestone for this withdrawal. Just as international intervention is seen as pump-priming democracy, it is seen as pump-priming peace, with *initial tensions being swiftly reduced by time*.

These conventional rules of thumb guide our empirical enquiry. We will attempt to test whether international peacekeeping troops are effective, and try to get some measure of appropriate levels of provision. We will try to assess the extent to which pump-priming democracy is likely to strengthen post-conflict peace, and the consequences of different degrees of decentralization. We will measure whether economic issues can safely be left on the back-burner whilst more pressing political issues are pursued. Finally, we will attempt to assess whether elections are effective in strengthening peace.

Going beyond these rules of thumb, we will also try to get some sense of how post-conflict risks vary according to simple and observable initial characteristics that the Peace-Building Commission could use, without controversy, to allocate the resources available for post-conflict situations more effectively.

### ***Theory and Quantification***

There is as yet no academic consensus on the causes of violent conflict, let alone an agreed theory that is specific to post-conflict. However, the predominant recent theoretical position as described in the survey of civil war in the *Handbook of Defence Economics*, has been to emphasize the conditions that determine the feasibility of rebellion as being more important than those that influence motivation (Collier and Hoeffler, 2007). The defining feature of civil war is the emergence and durability of a private rebel army, and under most conditions such organizations are likely to be neither financially nor militarily feasible. Somewhat analogous to Hirshleifer's 'Machiavelli Theorem' (Hirshleifer, 2001), the feasibility thesis suggests that where insurrection is feasible it will occur, with the actual agenda of the rebel movement being indeterminate. There is now reasonable empirical support for this thesis. Three recent quantitative studies of the causes of civil war find that variables that are most readily interpreted as indicators of feasibility are important, namely low per capita income, slow economic growth, and large exports of natural resources (Fearon and Laitin, 2003; Miguel *et al.*, 2004; Collier and Hoeffler, 2004a). Low per capita income is interpreted by Fearon and Laitin as proxying the incapacity of the state to maintain effective control over its territory. Both low income and slow growth can be interpreted as lowering the recruitment cost of rebel troops, and the predation of natural resources can provide rebel organizations with finance.

There has been little application of this work to the post-conflict situation. Within the framework of their logit model of the causes of conflict, Collier and Hoeffler, (2004a) investigated the effect of the passage of time since the most recent previous conflict. They found that risks fall with time, implying that the post-conflict decade is unusually risky. This high risk is indeed consistent with the feasibility thesis. By revelation, post-conflict societies are societies in which rebellion had proved to be feasible. This is somewhat analogous to the celebrated prediction from the economic theory of crime that criminals would have a high rate of recidivism (Becker, 1968). Further, during conflict one, or often several, rebel organizations are assembled, and stocks of armaments are amassed. Both of these are legacies that lower the cost of rebellion in the post-conflict period.

The feasibility theory can be contrasted with the current policy model. As discussed above, currently policy addresses post-conflict risks primarily through political design. Underlying this is an implicit theory of the causes of conflict which gives precedence to motivation and in particular to grievances based on political exclusion. If instead feasibility is the decisive factor, then economic and military instruments might be more important. To date the only aspect of post-conflict risk that has been modeled is the effect of military spending by the government, which has been found to have a differential effect in post-conflict situations (Collier and Hoeffler, 2006a, 2006b). Typically, post-conflict governments maintain military spending at a very high level, in part as a response to the high risk of further conflict. However, uniquely in post-conflict situations, allowing for the interdependence between risks and spending, such spending is counter-productive. Collier and Hoeffler attempt to explain this through a game-theoretic model in which high military spending by the government inadvertently signals an intention on the part of the government to exploit the potential time-inconsistency of any peace agreement, by renegeing on the terms of settlement.

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### 3. Methodology and Data

The approach adopted in the previous empirical analyses of the causes of conflict discussed above was that of logit analysis or its variants. Such an approach cannot investigate in any depth either the distinctive structure of post-conflict risks or how they evolve as a result of policy choices. In this paper our approach is to estimate a hazard function of the risk of conflict reversion on a sample confined to post-conflict countries. We assume the hazard is exponential and proportional:

$$h(x_t, \beta; t) = \exp(x_t \beta) h^B(t), \quad (1)$$

where  $t$  denotes the duration of a post-conflict peace period,  $x_t$  is a vector of exogenous variables observed at calendar time  $t$ ,  $\beta$  is a vector of unknown parameters and  $h^B$  is the baseline hazard.<sup>1</sup> With this specification,  $\beta_j > 0$  implies that an increase in the associated

<sup>1</sup> We use a  $t$  subscript on the vector of explanatory variables to indicate that the explanatory variables may be, but are not necessarily, time varying.

explanatory variable  $x_j$  leads to an increase in the hazard of war, and a reduction in the expected duration of peace; and vice versa if  $\beta_j < 0$ . For the baseline hazard  $h^B(t)$  we adopt a piecewise exponential model, which is quite flexible. Our starting point is a specification where we divide the time axis into  $W$  intervals by the points  $c_1, c_2, \dots, c_W$  and assume constant baseline hazard rates within each interval:

$$h^B(t) = \exp\left(\alpha + \sum_{w=2}^W \lambda_w d_w(t)\right), \quad (2)$$

where  $d_w(t)$  is a duration dummy variable equal to one if  $c_{w-1} < t \leq c_w$  for  $c_0 = 0$  and  $c_W = \infty$ , and zero otherwise;  $\alpha$  is an intercept; and  $\lambda_2, \dots, \lambda_W$  are baseline hazard parameters. Thus the baseline hazard is allowed to vary freely between intervals, which imposes few restrictions on duration dependence. We include an intercept in the model and exclude the first duration dummy (i.e.  $d_1$ ), which implies that negative (positive) coefficients on  $\lambda_2, \dots, \lambda_W$  imply that the hazard is lower (higher) than in the first interval.

A useful metric in discussing post-conflict risks is the average risk that the peace will collapse. In our sample of 68 post-conflict episodes, 31 reverted to war, so that the average risk was 46%. Since our focus is going to be on the first post-conflict decade, it is useful to consider those reversions that occurred during that decade. This reduces the proportion to 40%. This serves as a benchmark for calibrating the importance of each explanatory variable. With our modeling framework, the likelihood that a country 'survives' the first decade of peace is given by the survival function evaluated at  $t = 10$  years:

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$$S(10) = \exp\left(-\int_{u=0}^{10} h(.,u) du\right),$$

and so the risk of a collapse is given by  $F(10) = 1 - S(10)$ .

The limitation of the hazard approach is that by dint of the sample it cannot make comparisons either with risks in countries that are not post-conflict or with risks that prevailed in the post-conflict country prior to conflict. However, it enables us to be much more precise in our investigation of what determines the initial risk of conflict reversion, of how that risk evolves naturally simply by the passage of time, and of how its evolution is affected by interventions during the post-conflict period. We have previously used this approach to investigate the duration of civil war (Collier, Hoeffler and Söderbom, 2004).

For the analysis of post-conflict risks we need to date both the end of conflict and, should the society revert to conflict, the end of peace. Dating the start, and more importantly for this paper, the end of the conflict is often difficult. Trigger events can be dated, but often the violence escalates over some period of time before it reaches the threshold relevant for it to be classified as a civil war. Wars end either with a military victory, settlement or truce. About half of all civil wars end in the military defeat of one party (Sambanis 2000).

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This makes dating the ending of wars somewhat easier than using the dates of peace agreements, some of which may not have resulted in an end to military action. The duration of the war does not only depend on being able to date a start and end but also on the definition of violence thresholds. Data sets which define a civil war by 1,000 battle related deaths per year have on average shorter wars than data sets with lower thresholds. Consider, for example, a war with more than 1,000 battle-related deaths during the first year. If the number of such deaths falls beneath the threshold in the second year but reaches it again during the third year a rigid application of the 1,000 deaths criterion leads to the episode being classified as a failed post-conflict situation. If, however, a lower threshold is used to define the restoration of peace then the episode might be treated as a continuous war. Thus, the problems with respect to dating the start and end of the conflict are not only of importance for the analysis of the duration of conflicts but also for the analysis of post-conflict risks.

The two most commonly used data sets are the Correlates of War (COW) project initiated by Singer and Small (1984, 1992) and updated by Gleditsch (2004), and the Armed Conflict Dataset (ACD) by Gleditsch *et al* (2002). The COW definition of civil wars is based on four main characteristics. It requires that there is organized military action and that at least 1,000 battle deaths resulted. In order to distinguish wars from genocides, massacres and pogroms there has to be effective resistance, in which at least 5 percent of the deaths have been inflicted by the weaker party. The definition of war as used in ACD has two main dimensions. First, they distinguish four types of violent conflicts according to the participants and location: (1) extra-systemic conflicts (essentially colonial or imperialist wars), (2) interstate wars, (3) intrastate wars and (4) internationalized intrastate wars. The second dimension defines the level of violence. *Minor* conflicts produce more than 25 battle related deaths per year, *intermediate* conflicts produce more than 25 battle related deaths per year and a total conflict history of more than 1,000 battle related deaths and lastly *wars* are conflicts which result in more than 1,000 battle related deaths per year. ACD does not report end dates to the conflicts and for the present analysis we use the updated COW data.<sup>2</sup>

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#### 4. The Hazard Generated by Conflict Legacy

We now estimate a standard hazard function on our data. Our core regression is shown in Table 1, column 1. In subsequent columns we investigate variations.

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The factors that influence, or might influence post-conflict risks can be grouped into temporal, economic, political, social, and military. We consider the variables in these groupings.

#### *Temporal Effects*

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Part of the rationale for short periods of peacekeeping, often merely two years, is that it is the initial post-conflict period during which risks are highest. In our previous work using

<sup>2</sup> Data are described in Gleditsch (2004) and are available from <http://weber.ucsd.edu/~kgledits/expwar.html>

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logistical techniques we found that post-conflict risks indeed fall over time. Our present hazard function enables us to investigate this using a different approach, the key difference being that we are looking more intensively at a shorter period, the post-conflict decade, as opposed to a gradual and prolonged return to normality over several decades. We again find that there is some very weak tendency for time to reduce risk, but the reduction is not as continuous as implied by our previous results, it is not large, and it is not statistically significant. To the extent that there is a systematic effect, the nearest the data gets to any significant change in the level of risk is between the first four years and the subsequent six. The risk during the first four years is 23%, and during the remaining six years it is 17%, conditional upon the first four years having been peaceful. For policy purposes the key conclusion is that there is no 'safe period' during the decade. The entire post-conflict decade faces a high level of risk.

### *Economic Influences*

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The first significant economic influence is the level of income. To reduce the problem of endogeneity we introduce this variable with a two-year lag. The variable is time-varying: the society can do nothing about the level of income it inherits at the start of the peace, but its choices will influence how the level of income evolves during the decade. Income matters: it is highly significant and the effect is large. Benchmarked on the 40% risk at mean characteristics, if the initial level of income is twice the mean and all other characteristics are held constant, then the decade-risk falls to 31%. This has two powerful implications. One is that risks are considerably higher in low-income countries: DRC, Liberia, and East Timor are all much more alarming situations than Bosnia, other things equal. The other implication is that economic performance during the decade is likely to matter, if only because higher income will bring risks down.

In fact, the importance of economic performance is considerably greater than this, because growth itself matters. Faster growth directly and significantly reduces risk in the year in which it occurs, as well as cumulating into a higher level of income. To reduce the problem of endogeneity we lag the growth rate by one year. These effects are entirely consistent with results on the initial causes of conflict (Collier and Hoeffler, 2004a, Miguel et al. 2004, Fearon and Laitin, 2003), however, it should be stressed that the present results are specific to post-conflict and generated by an entirely different statistical process to that used in the analysis of initial causes. To get a sense of the importance of growth, we return to the 40% benchmark risk and vary the growth rate. Post-conflict societies have an immensely wide range of growth experience: outcomes are radically more dispersed than in normal growth situations (Collier and Hoeffler, 2004). Some post-conflict economies grow rapidly, others continue to fall apart. If the economy remains stagnant through the decade the decade-risk is 42.1%. If, instead, it grows at 10% per year, which is fast but not without precedent, the decade-risk falls to 26.9%. For completeness, we might note that this massive reduction is split almost equally between the direct contribution of growth to risk reduction in the year in which it occurs, and its cumulative contribution via its legacy of higher levels of income.

The evident implications of the economic variables is that, other things equal, international post-conflict efforts should be concentrated disproportionately in the poorest countries, and should focus heavily upon economic recovery.

A summary measure of the sort of growth-promoting policies, institutions and governance favored by the World Bank is its Country Policy and Institutional Assessment (CPIA). A high CPIA rating is generally associated with faster growth and in the post-conflict context its affect on growth is atypically strong (Collier and Hoeffler, 2004). Since growth is risk-reducing, there may thus be some presumption that an improvement in the CPIA would indirectly be risk-reducing. A potentially important issue is whether this is offset or indeed accentuated by any direct effects of the CPIA on risk. In a variant we therefore added the CPIA to the core regression, which of course already controls for the growth rate. The CPIA was completely insignificant and the sign of the effect was peace-promoting. While there is always a danger that particular policies will be growth-promoting but inadvertently exacerbate risk, the statistical evidence does not indicate that this is usually the case.

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### *Political Variables*

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We next turn to the political variables.<sup>3</sup> We first consider the degree of democracy. We rely upon the standard classification of countries on a scale of autocracy and democracy, that of Polity IV. Because the scale is ordinal it is inappropriate to treat it as a continuous variable. Rather, we search for significant break points. We find only one such break point, namely within the range of autocracy. There is a significant difference between states in which the polity is highly repressive, with an autocracy ranking of worse than -5, and all other states. Other than this the degree of democracy or autocracy has no significant effects. Unfortunately, severe autocracy appears to be highly successful in maintaining the post-conflict peace. Again using our benchmark of 40% risk, if the polity is highly autocratic the risk is only 24.6%, whereas if it is not highly autocratic the risk more than doubles to 62%. Clearly, we do not wish to advocate severe autocracy. However, it is important to recognize two uncomfortable implications. First, when the international community exerts effective influence to prevent autocracy it is likely to be substantially increasing risks of further violence, and so other measures will be needed to offset this effect. Second, it suggests that international pressure for democracy should be justified by criteria other than peace-strengthening. Democracy does not appear to be an instrument for enhancing the durability of post-conflict peace.

Our next political variable is post-conflict elections. Evidently, these are a very high profile international policy and so it is of particular interest to investigate their effect on risk. We find that post-conflict elections have statistically significant effects, but these are not straightforward. Elections *shift* the risk between years rather than either raising or lowering it. Specifically, an election reduces risk in the year of the election, but increases it in the year following the election. Presumably, in the election year antagonists divert

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<sup>3</sup> Sometimes there are missing data on these variables. Rather than lose observations we set missing observations to zero and introduce a dummy variable which takes the value of unity if the data are missing. See (Greene, 2003, p. 60) for details on this procedure, known as a modified zero-order regression.

their efforts from violence to political contest, whereas once the election is concluded the losers have a stronger incentive to return to violence. To illustrate the magnitude of the effect, consider an election held in year 3. This reduces the risk in the year of the election from around 6.2% to around 3.4%. However, in the following year the risk is increased from around 5.2% to around 10.6%. Evidently, the net effect taking the two years together is modestly to increase risk.

In our core regression (column 1) the election variable imposes the same coefficient but with opposite sign in the year of the election and in the subsequent year. We arrive at this specification through various steps. First, we allow the coefficients to be different for the two years, and also distinguish between the first election and subsequent elections since there is speculation in the practitioner literature that this distinction is important (Table 1, column 2). If anything, it is the adverse effect of elections in the year following the election that is significant, rather than the favorable effect in the year of the election. However, both for the first election and subsequent elections the pattern is similar: a favorable effect followed by an adverse effect. In column 3 we combine the election year and the subsequent year by imposing a sign-reversal and investigate whether the first election differs from subsequent elections. The hypothesis that these two coefficients are the same cannot be rejected at conventional levels of significance. In further variants we have investigated whether any of the years prior to the election year also show significant effects. Since a post-conflict election usually takes two years to organize, the event must be known to citizens well in advance. However, prior to the year of the election there is no effect on risk. Possibly, there is so much uncertainty and fluidity in post-conflict situations that pre-announced events with a long lead-time are heavily discounted. We also investigated whether the shifting effect depended upon the level of income of the society or its ethnic composition. Neither was significant.

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There are three important policy implications of this result. First, elections should not be treated as a systemic solution to the acute problem of post-conflict risk.<sup>4</sup> Second, as with democracy itself, post-conflict elections should be promoted as intrinsically desirable rather than as mechanisms for increasing the durability of the post-conflict peace. Third, they generate a misleading signal of calm. During the year of the elections the society experiences a lull, but this is followed by a resurgence of risk. Post-conflict elections are thus precisely the wrong ‘milestone’ on which to base international exit strategies.

Our final political variable is post-conflict constitutional architecture. Most post-conflict constitutions adopt a broadly unitary state, but a few constitutions grant substantial regional autonomy. Evidently, the granting of such autonomy is endogenous. However, we might expect that the normal preference on the part of the politically powerful is for a unitary state so that regional autonomy is only granted in situations that are too demanding for this to be realistic. Thus, our priors are that the underlying risk is likely to be greater in contexts in which autonomy is granted. Because there are few cases of autonomy, the variable is not statistically significant at conventional levels: in our core

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<sup>4</sup> Caplan (2005) considers elections in post-conflict situations. He suggests that if local elections precede national parliamentary elections, national elections are less likely to generate a focus for violence and thus a breakdown of the peace.

regression it is only significant at 15%. However, the effect is very large. Without autonomy the decade-risk is 46.2%, whereas with autonomy the risk falls to 12.2%. This may be a chance result, or it may be because situations where autonomy is granted are already fundamentally safer. However, the result is at least suggestive that autonomy can be a helpful constitutional design feature in post-conflict situations.

We have investigated a range of other aspects of political design, but not found any to be even marginally significant. In Table 1 we report one such variant, an index of economic freedom.

### *Social Variables*

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Since issues of ethnicity loom large in post-conflict discourse we investigated a range of variables that describe the ethnic composition of the society. None of these variables was significant. In Table 1 we report the most familiar measure, ethnic diversity. Like the other measures this is insignificant, but to the extent that it has an effect it is favorable: societies that are more diverse have lower risks.

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The other variable we investigated was the size of the diaspora. We measured only the diaspora in the USA, and took this as a percentage of the population of the post-conflict country. The rationale for confining the measure to the USA is partly that of consistent data, and partly that it avoids the problem of having to aggregate immigrants across distinct cultural, economic and legal environments. A large diaspora is sometimes a consequence of a past history of conflict but in this paper we have made no allowance for this endogeneity. At least superficially, one might expect that larger diasporas proxy more severe conflicts which in turn might have higher risks of conflict reversion. In fact, we find that diasporas significantly reduce post-conflict risks and this result seems less likely to be a spurious consequence of endogeneity. The result is somewhat surprising since diasporas tend to be a source of finance for politically more extreme organizations. The effect is quite large, doubling the diaspora reduces risk from 40% to 32.8%.

### *Military Variables*

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Finally, we introduce military variables. Recall that military spending by the post-conflict government has been found to be counter-productive (Collier and Hoeffler, 2006). For the present study the United Nations has supplied us with comprehensive and detailed data on the deployment of international peacekeeping troops in post-conflict situations. From this we have constructed a variable on the expenditure per year on peacekeeping troops, measured as the logarithm of dollars spent per year. Potentially peacekeeping expenditures could be measured either in absolute terms or relative to the size of the society (its population or its economy). We find that it is far more significant when measured in absolute terms. Underlying this choice is some characterization of the deterrence of rebellion. That it is the absolute size of military deployment that matters suggests that the size of the potential rebel force is not strongly related to the size of the society so that deterrence has strong economies of scale. Virtually all rebellions have to go through a phase of being small even if they subsequently grow to very different sizes.

In this incipient phase they can perhaps be deterred by a peacekeeping force of given absolute size.

In some post-conflict situations peacekeeping forces are not deployed and so deployment is potentially biased according to the level of risk. To an extent we are able to control for this by including a dummy variable which takes the value of unity if troops are not deployed. This variable is significant and negative: troops are posted to environments that are intrinsically more risky. Similarly, the scale of deployment may be systematically related to the level of risk. We have attempted to find good instruments for these decisions but have failed to do so. We therefore enter the expenditure on peacekeepers directly as an explanatory variable, recognizing that there are remaining dangers of endogeneity<sup>5</sup>. If endogeneity is a problem the likely direction of bias is presumably that more peacekeepers may tend to be deployed where the risks are greater: this would clearly be the implication of the dummy variable for non-deployment. Thus, if peacekeepers were ineffective there would be a spurious correlation in which they appeared to be increasing the risk of peace collapse. An apparently unfavorable effect of peacekeepers might therefore be spurious, and an apparently favorable effect is likely to be biased downwards.

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We find that peacekeeping expenditures significantly reduce the risks of further conflict, the effect being significant at 2%. The effect is large: doubling expenditure reduces the risk from 40% to 31%.

### *Comparing Two Packages*

As will be evident from our results, political design does not appear to reign supreme as the mechanism for post-conflict peace. We first simulate a policy package in which political design has primacy in the peace strategy and which might be thought of as 'business as usual'. The political design is for a unitary state which adopts sufficiently democratic structures to avoid severe autocracy, and holds elections in the third post-conflict year. External peacekeeping expenditure is set at the mean for post-conflict situations, but economic issues are relegated to the back-burner so that the economy is stagnant. All other variables are set at the same levels as for our other simulations. The risk of reversion to conflict within the first decade is predicted to be astonishingly high, at 75.4%. We then investigate the risk of a package which might be thought of as 'politics supported'. In this package the political variables are the same as in the 'business as usual package' package, but external military assistance and economic recovery are also given priority. Spending on external military peacekeeping is set at four times the average and the economy is given priority, achieving growth of 10% per year. The risk of conflict reversion falls dramatically to 36.7%. The decline in risk is achieved by the combination of policies. Economic growth without military intervention would bring risks down quite

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<sup>5</sup> Doyle and Sambanis (2006) examine the endogeneity of UN interventions. Their IV estimations indicate that the impact of UN interventions is similar to the one obtained from the uninstrumented regression models. They tentatively conclude 'that bargaining inside the UN is too complex to respond in a straightforward manner to a particular logic of intervention' in other words UN interventions can be treated as exogenous.

substantially, but leave them dangerously high at 55.2%. While the ‘politics supported’ package is at the high end of both observed post-conflict growth and observed post-conflict peacekeeping, neither is an extrapolation beyond the range of observed experience. We should note that even with the ‘politics supported’ package, risks of conflict reversion are high: unitary states with non-autocratic regimes are inherently fragile in these settings. As a portfolio decision lending into such risks is daunting. However, given the enormously high costs of conflict, the risk-reduction that economic reconstruction and military peacekeeping provide are likely to be very cost-effective (Collier and Hoeffler, 2004b).

## 5. Conclusion and Implications

In this paper we have used all available historical cases of post-conflict episodes to investigate the risks of conflict reversion by means of hazard functions. Even with this comprehensive coverage the past may not be a very accurate guide to the future: a changed international environment may be making peace more secure. Nevertheless, the past is all that we have to guide policy: unchained from experience, international action may generate risks as well as reduce them.

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Our approach has been exclusively statistical. This has evident limitations. Our results are best interpreted in conjunction with in-depth case study evidence, the two approaches being complementary. Nevertheless, the statistical approach does add value, in part because the case study approach provides excessive license both to interpret particular situations according to the priors of the particular researcher, and to generalize in an unwarranted manner from the particular. Indeed, since most conflict case studies are done by political scientists, there is a natural tendency to over-emphasize political choices as explanations. Lest we should be accused of an equivalent bias towards economics, we should note that our biases are constrained by our method.

Post-conflict situations are typically fragile. This conclusion does not need any advanced statistical methods, it is apparent from the raw numbers. We have benchmarked on the average risk that a post-conflict society reverts to conflict within the decade, namely 40%. This is far higher than the risk faced by the typical low-income country, and so the international community is correct to focus explicitly on post-conflict situations as warranting distinctive engagement.

In Section 2 we attempted to deduce the rules-of-thumb which characterize current practice. These rules-of-thumb essentially reflect an implicit practitioner model of the causes of conflict which stresses motivation: grievances must be addressed by a political arrangement in order to avoid conflict reversion. In contrast to this interpretation of conflict as being explicable in terms of motive, recent theories of conflict have emphasized feasibility: rebellions happen where they are feasible. This theory would explain the high rate of reversion to conflict in post-conflict situations as reflecting its atypical feasibility, and prioritize economic and military instruments for security as necessary supplements to the political solutions sought by practitioners.

To the extent that our characterization is reasonable, our results give cause for concern. It is, of course, entirely commendable that the international community should encourage inclusive political arrangements in post-conflict situations: democracy and elections are intrinsically desirable. However, the systematic effect of such political arrangements is not peace-enhancing, and indeed leaves the typical post-conflict society severely exposed to the risk of further conflict.

An implication of our analysis is that the political solutions need to be supplemented by robust economic and military external assistance. Economic development does substantially reduce risks, but it takes a long time. International forces appear to be very effective in maintaining peace, but the actual scale of provision is low relative to what appears warranted given the high costs of conflict reversion. Unpalatable as it may be, peace appears to depend upon an external military presence sustaining a gradual economic recovery, with political design playing a somewhat subsidiary role.

We have also found a simple and statistically strong relationship between the severity of post-conflict risks and the level of income at the end of the conflict. This provides a clear and uncontroversial principle for resource allocation that might be of use to the new Peace-Building Commission of the United Nations: resources per capita should be approximately inversely proportional to the level of income in the post-conflict country. To date, allocations have been massively deviant from this simple principle.

We should stress that any statistical analysis such as our own needs to be supplemented before applied in any particular situation by appropriate contextual knowledge. There are limits as to how much the past can be a guide to the future, and even greater limits as to how much a statistical analysis can extract from this past experience. Nevertheless, because post-conflict issues are so burdened with ideology and political glamour, an analysis based on statistics can be a useful antidote to other potent influences.

Table 1: Duration of Post-War Peace

	(1)	(2)	(3)	(4)
<b>Economic</b>				
Per capita income	-0.427* (0.085)	-0.431* (0.086)	-0.422* (0.089)	-0.551** (0.044)
Per capita income growth	-3.549** (0.027)	-3.716** (0.022)	-3.613** (0.025)	-4.184** (0.018)
<b>Political</b>				
Democracy	1.231** (0.015)	0.989** (0.047)	1.224** (0.016)	1.515*** (0.004)
Democracy missing (dummy)	1.752*** (0.007)	1.726*** (0.008)	1.754*** (0.007)	1.798*** (0.006)
Regional autonomy	-1.561 (0.154)	-1.318 (0.182)	-1.318 (0.182)	-1.148 (0.323)
Regional autonomy missing (dummy)	-0.253 (0.620)	-0.253 (0.622)		
Election shift	-0.709** (0.049)			-0.754** (0.041)
1 <sup>st</sup> election		-0.495 (0.517)		
Year following 1 <sup>st</sup> election		0.997* (0.088)		
Subsequent elections		-0.318 (0.675)		
Year following sub. Elections		0.787 (0.180)		
1 <sup>st</sup> election shift			-0.820* (0.085)	
Subsequent elections shift			-0.593 (0.226)	
In Economic Freedom				-0.336 (0.235)
Economic Freedom missing (dummy)				-2.757** (0.047)
<b>Social</b>				
In Diaspora	-0.333*** (0.005)	-0.345*** (0.004)	-0.337*** (0.005)	-0.259** (0.036)
Diaspora missing (dummy)	3.465** (0.014)	3.585** (0.012)	3.503** (0.013)	-2.626* (0.067)
Ethnic diversity	-1.038 (0.215)	-1.068 (0.204)	-1.035 (0.216)	-1.439 (0.090)
Ethnic diversity missing (dummy)	-13.154 (0.988)	-14.263 (0.992)	-14.209 (0.992)	
<b>Peacekeeping</b>				
In UN peace keeping expenditure	-0.405** (0.017)	-0.414** (0.016)	-0.407** (0.016)	-0.478*** (0.009)
No UN PKO	-3.886** (0.036)	-3.842** (0.027)	-3.738** (0.029)	-4.735** (0.013)
UN data missing (dummy)	-3.886** (0.036)	-3.992** (0.033)	-3.915** (0.035)	-4.919** (0.013)
<b>Time</b>				
Years 4+ of peace	-0.475 (0.264)	-0.464 (0.301)	-0.454 (0.289)	-0.392 (0.374)
Nobs	825	825	825	825
Number of episodes	74	74	74	74
Number of failures	33	33	33	33
Log likelihood	-66.821	-66.539	-66.759	-63.041

Note: z-values in parentheses

## **Data Sources:**

### **CPIA**

We measure policy by the World Bank's Country Policy and Institutional Assessment indicator (CPIA). It ranges from 1 (poor) to 5 (good). The CPIA measure of policy has 20 equally weighted components divided into four categories: (1) Macroeconomic Management and sustainability of reforms (2) Structural policies (3) Policies for social inclusion (4) Public sector management.

### **Democracy**

'Democracy' is a dummy which takes a value of one if the polity score takes a value of greater than -5. Source for the polity data: <http://www.cidcm.umd.edu/inscr/polity/>

### **Diaspora**

We used the data on the foreign born population in the US and divided these numbers by the total population in the country of origin. Source: US Census; US Yearbook of Immigration Statistics 2004

### **Economic growth**

Using WDI 2005 data for GDP per capita we calculated the annual growth rates.

### **Economic freedom**

Index ranging from 0 (low) to 10 (high). Source: <http://www.freetheworld.com/>

### **Elections**

Source: Banks' Cross-National Time-Series Data Archive  
<http://www.scc.rutgers.edu/cnts/about.cfm>.

### **Ethnic Fractionalization**

The ethnicity variable involves a weighted combination of racial and linguistic characteristics. The fractionalization variable is computed as one minus the Herfindahl index of group shares, and reflects the probability that two randomly selected individuals from a population belonged to different groups. Source: Alesina et al (2003)  
<http://www.nber.org/papers/w9411>.

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### **GDP per capita**

We measure GDP per capita annually. Data are measured in constant 1995 US dollars and the data source is WDI 2005.

### **Primary Commodity Exports**

The ratio of primary commodity exports to GDP proxies the abundance of natural resources. The data on primary commodity exports and GDP were obtained from the World Bank. Export and GDP data are measured in current US dollars.

### **UN expenditure**

UN via World Bank: data available from the authors.

## References

- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., Wacziarg, R. (2002) Fractionalization, NBER Working Paper 9411, Cambridge, MA.
- Becker, G. (1968). Crime and Punishment: An Economic Approach, *The Journal of Political Economy* 76: 169-217.
- Caplan, R. 2005. International Governance of War-Torn Territories: Rule and Reconstruction. Oxford UK: Oxford University Press.
- Collier, P., L. Elliot, H. Hegre, A. Hoeffler, M. Reynal-Querol and N. Sambanis (2003) Breaking the Conflict Trap: Civil War and Development Policy, World Bank Policy Research Report. Oxford, UK: Oxford University Press.
- Collier, P. and A. Hoeffler, 2004. Aid, Policy and Growth in Post-Conflict Societies, *European Economic Review*.
- \_\_\_\_\_. 2004a. Greed and Grievance in Civil War, *Oxford Economic Papers*.
- \_\_\_\_\_. 2004b. Conflicts, in Bjorn Lomborg, ed., *Global Crises: Global Solutions*, Cambridge University Press.
- \_\_\_\_\_, 2007, Civil War, in K. Hartley and T. Sandler, (eds) *Handbook of Defence Economics*, North Holland.
- \_\_\_\_\_, 2006a Military Expenditure in Post-Conflict Societies, *Economics of Governance*, 7, 89-106.
- \_\_\_\_\_, 2006b, Unintended Consequences? Does Aid Fuel Arms Races? *Oxford Bulletin of Economics and Statistics*.
- Collier, P., A. Hoeffler and M. Söderbom, 2004. On the Duration of Civil War, *Journal of Peace Research*.
- Fearon, J. and D. Laitin, 2003. Ethnicity, Insurgency, and Civil War. *American Political Science Review* 97 (1): 75-90.
- Gleditsch, K. S, 2004. "A Revised List of Wars Between and Within Independent States, 1816-2002" *International Interactions* 30:231-262.
- Gleditsch, N.P., P. Wallensteen, M. Eriksson, M. Sollenberg and H. Strand, 2002. Armed Conflict 1946–2001: A New Dataset, *Journal of Peace Research* 39(5): 615–637.
- Hirshleifer, J., 2001, *The Dark Side of the Force*, Cambridge University Press.
- Greene, William H., 2003. *Econometric Analysis*. New Jersey: Prentice-Hall.

Miguel, E. S. Satyanath, and E. Sergenti (2004) Economic Shocks and Civil Conflict: an Instrumental Variables Approach. *Journal of Political Economy*, 112. 725-54.

Paris, R. (2004) *At War's End: Building Peace after Civil Conflicts*. Cambridge UK: Cambridge University Press.

Sambanis, N. and M. W. Doyle (2006) Short-Term and Long-Term Effects of United Nations Peace Operations, mimeo.

Small, M. and J. D. Singer (1982) *Resort to Arms: International and Civil War, 1816-1980*. Beverly Hills: Sage.

Stedman, S.J., Rothchild, D. S. and E. M. Cousens (2002) *Ending Civil Wars: The Implementation of Peace Agreements*. Boulder Colorado: Lynne Rienner.