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Post-Conflict Risks*

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Post-conflict societies face two distinctive challenges: economic recovery and reduction of the risk of a recurring conflict. Aid and policy reforms have been found to be effective in economic recovery. In this article, the authors concentrate on the other challenge – risk reduction. The post-conflict peace is typically fragile: nearly half of all civil wars are due to post-conflict relapses. The authors find that economic development substantially reduces risks, but it takes a long time. They also find evidence that UN peacekeeping expenditures significantly reduce the risk of renewed war. The effect is large: doubling expenditure reduces the risk from 40% to 31%. In contrast to these results, the authors cannot find any systematic influence of elections on the reduction of war risk. Therefore, post-conflict elections should be promoted as intrinsically desirable rather than as mechanisms for increasing the durability of the post-conflict peace. Based on these results, the authors suggest that peace appears to depend upon an external military presence sustaining a gradual economic recovery, with political design playing a somewhat subsidiary role. Since there is a 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: resources per capita should be approximately inversely proportional to the level of income in the post-conflict country.

Introduction

Post-conflict societies face two distinctive challenges: economic recovery and reduction of the risk of a recurring conflict. 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 & Hoeffler, 2004a). In this article, we study the other challenge, reduction of the

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risk of a recurring conflict. 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 the next section, 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 the subsequent section, we discuss our methodology and our sources of data. There are various, often difficult choices that must be made in building a dataset 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 the penultimate section, we present our results, showing how the hazard of conflict reversion is affected by both the initial post-conflict characteristics and time-varying characteristics. The final section concludes with a discussion of the implications for international policy.

Post-Conflict Risks: Current Policy and Recent Research

Post-conflict policy has arisen as a practical international concern only 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, Rothchild & Cousens (2003) provide a comprehensive overview of peacebuilding 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 Peacebuilding 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 Peacebuilding 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 (see, for example, Ashdown, 2007) 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 of such expenses where such troops are provided being around \$5 per head of the population.

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 constitution varies. The settlement in Sudan provides considerable autonomy for the South, but more usually it favours a fairly *unified state*.

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 & Hoeffler, 2004a). 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, the election 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 we will 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 while 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 Peacebuilding 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 Defense Economics*, has been to emphasize that the conditions that determine the feasibility of rebellion are more important than those that influence motivation (Collier & Hoeffler, 2007a). 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. Recent quantitative studies of the causes of civil war find that variables that are most readily interpreted as indicators of feasibility are important, namely, mountainous terrain, protection through external security commitments, low per capita income, slow economic growth and large exports of natural resources (Fearon & Laitin, 2003; Miguel, Satyanath & Sergenti, 2004; Collier & Hoeffler, 2004b; Collier, Hoeffler & Rohner, 2007). Mountainous terrain provides safe havens for rebel forces, whereas external security commitments may discourage rebellion by reducing the prospects of success. Low per capita income is interpreted by Fearon & 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. While the significance of most of these variables could also be explained in other terms, feasibility provides a simple and unifying account.

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 & Hoeffler (2004b) 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. Walter (1999) and Hartzell & Hoddie (2003) challenge this view by examining a subset of post-conflict situations, namely, those conflicts that ended in a negotiated settlement. Their analysis suggests that credible guarantees on the terms of the agreement, especially in form of international security arrangements, make it more likely for the peace to last.

If, indeed, feasibility and credibility are the decisive factors, then economic and military instruments might be more important in post-conflict situations. To date, the only

aspect of general post-conflict risk that has been modelled is the effect of military spending by the government, which has been found to have a differential effect in post-conflict situations (Collier & Hoeffler, 2006, 2007b). 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 counterproductive. Collier & 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.

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 article, 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:

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

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

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 , 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 1 if $C_{w-1} < t \leq C_w$ for $C_0 = 0$ and $C_w = \infty$, and 0 otherwise; α 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. The standard non-parametric Kaplan-Meier estimator indicates that the likelihood of survival for at least 10 years is 0.60. Hence, the implied likelihood of failure (i.e. reversion to war) in the first decade of post-conflict peace is 40%. This serves as a benchmark for calibrating the importance of each explanatory variable. With our modelling framework, the likelihood that a country 'survives' the first decade of peace is given by the survival function evaluated at $t = 10$ years:

$$S(10) = \exp\left(-\int_{u=0}^{10} h(.; u) du\right), \quad (3)$$

¹ We use a τ subscript on the vector of explanatory variables to indicate that the explanatory variables may be, but are not necessarily, time-varying.

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, how that risk evolves naturally simply by the passage of time, and 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 & 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 article, 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 relevant threshold for it to be classified as a civil war. Wars end with a military victory, settlement or truce. About half of all civil wars end in the military defeat of one party (Sambanis, 2000). 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 depends not only on being able to date a start and end but also on the definition of violence thresholds. Datasets that define a civil war by 1,000 battle-related deaths per year have, on average, shorter wars than datasets 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 of importance not only for the analysis of the duration of conflicts but also for the analysis of post-conflict risks.

The two most commonly used datasets are the Correlates of War (COW) project, initiated by Small & Singer (1982) and updated by Gleditsch (2004), and the Uppsala/PRIO 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 – at least 5% of the deaths have been inflicted by the weaker party. The definition of war as used in the 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 *wars* are conflicts which result in more than 1,000 battle-related deaths per year. The ACD does not report end dates to the conflicts and, for the present analysis, we use the updated COW data.²

Our analysis spans the 1960–2002 period. We start in 1960 simply because we wish to link the duration data on peace periods with economic and political variables, most of

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

which are not available before 1960. A complete list of the peace periods used in our analysis is provided in Appendix A. As can be seen, peace duration is defined simply as the length of time between the end of a conflict and the beginning of a new one (this would constitute an uncensored peace spell), or between the end of a conflict and the end of the time period over which the country is observed, which is usually 31 December 2002 (this would be a censored spell).

The Hazard Generated by Conflict Legacy

We now estimate a standard hazard function on our data. Our core regression is shown in Table I, column 1. In subsequent columns, we investigate variations. The table reports estimated coefficients (log hazard ratios) and the associated z-values (in parentheses). 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.³

Temporal Effects

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 logistical techniques, we found that post-conflict risks indeed fall over time. As discussed above, we include duration dummies in the general specification of the model in order to allow the hazard of war to change over time. If, as one might expect, the

risk of war falls as the time since the settlement increases, the coefficients on the duration dummies would be negative (since the first duration dummy is excluded). Indeed, if the relationship is monotonic, this would show up as larger and larger negatives in the estimates of $\lambda_2, \dots, \lambda_w$. In choosing the cutoff points for the duration dummies and the number of duration dummies to allow for, we let the data guide us. We started out using a fairly rich set of duration dummies, allowing the hazard to change every two years during the first decade of post-conflict peace. Omitting the first duration dummy, d_1 , we then tested for the joint significance of $\lambda_2, \dots, \lambda_5$ and found we could not reject the null hypothesis that these coefficients are jointly zero. This suggests that the baseline hazard may be flat, that is, that the risk of conflict does not depend on the length of peace, conditional on the other explanatory variables in the model. We then experimented with various alternative ways of specifying the baseline hazard, and the main result – a flat baseline hazard – remained robust. In the end, we decided on a very parsimonious specification, allowing for just one shift in the baseline hazard, after four years of peace. All the results shown in Table I are based on this specification. As can be seen in the table, the coefficient on the duration dummy for spells longer than four years is negative, suggesting a reduction in the risk of war after four years, but the effect is not large, and it is not statistically significant. 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

The first significant economic influence is the level of per capita income (expressed in logarithmic form). To reduce the problem of

³ Notice that our set of explanatory variables consists of both time-invariant and time-varying variables. In the core specification (column 1, Table I), all variables except ethnic fractionalization and autonomy are time-varying. The highest frequency with which any of the explanatory variables varies is annual, e.g. log of per capita GDP and its growth rate.

Table I. Duration of Postwar Peace

	(1)	(2)	(3)	(4)
<i>Economic</i>				
Per capita income	-0.427 (1.72) ⁺	-0.431 (1.72) ⁺	-0.423 (1.70) ⁺	-0.551 (2.01)*
Per capita income growth	-3.548 (2.21)*	-3.716 (2.29)*	-3.613 (2.24)*	-4.184 (2.37)*
<i>Political</i>				
Democracy	1.230 (2.43)*	1.194 (2.34)*	1.224 (2.42)*	1.515 (2.86)**
Democracy missing (dummy)	1.752 (2.68)**	1.726 (2.64)**	1.754 (2.69)**	1.798 (2.74)**
Regional autonomy	-1.561 (1.43)	-1.619 (1.46)	-1.538 (1.41)	-1.148 (0.99)
Regional autonomy missing (dummy)	-0.253 (0.50)	-0.253 (0.49)	-0.240 (0.47)	0.123 (0.24)
Election shift	-0.709 (1.97)*			-0.754 (2.05)*
1st election		-0.495 (0.65)		
Year following 1st election		0.997 (1.70) ⁺		
Subsequent elections		-0.318 (0.42)		
Year following sub. Elections		0.787 (1.34)		
1st election shift			-0.820 (1.72) ⁺	
Subsequent elections shift			-0.593 (1.21)	
ln Economic freedom				-0.336 (1.19)
Economic freedom missing (dummy)				-2.757 (1.99)*
<i>Social</i>				
ln Diaspora	-0.333 (2.82)**	-0.345 (2.86)**	-0.337 (2.83)**	-0.259 (2.10)*
Diaspora missing (dummy)	3.464 (2.46)*	3.585 (2.51)*	3.503 (2.48)*	2.626 (1.83) ⁺
Ethnic diversity	-1.038 (1.24)	-1.068 (1.27)	-1.035 (1.24)	-1.439 (1.70) ⁺
Ethnic diversity missing (dummy)	-15.198 (0.01)	-14.263 (0.01)	-14.209 (0.01)	-16.206 (0.01)
<i>Peacekeeping</i>				
ln UN peacekeeping expenditure	-0.405 (2.38)*	-0.414 (2.42)*	-0.407 (2.40)*	-0.478 (2.62)**
No UN PKO	-3.714 (2.16)*	-3.842 (2.21)*	-3.738 (2.18)*	-4.735 (2.50)*
UN data missing (dummy)	-3.886 (2.09)*	-3.992 (2.13)*	-3.915 (2.11)*	-4.919 (2.49)*

(continued)

Table I. (Continued)

	(1)	(2)	(3)	(4)
<i>Time</i>				
Years 4+ of peace	-0.475 (1.12)	-0.464 (1.03)	-0.454 (1.06)	-0.392 (0.89)
Log likelihood	-66.821	-66.539	-66.759	-63.041
Number of episodes	74	74	74	74
Number of failures	33	33	33	33

Absolute values of z-statistics in parentheses. * significant at 5% level; ** significant at 1% level.

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. Compared with the 40% risk at the 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: the Democratic Republic of Congo, Liberia and East Timor are all much more alarming situations than Bosnia, other things being 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.⁴ Faster growth directly and significantly reduces risk in the year in which it occurs, as well as cumulating into a higher level of income.⁵ These effects are entirely consistent with results on the initial causes of conflict (Collier & Hoeffler,

2004b; Miguel, Satyanath & Sergenti, 2004; Fearon & Laitin, 2003). However, it should be stressed that the present results are specific to post-conflict and generated by an entirely different statistical process from 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 & Hoeffler, 2004a). Some post-conflict economies grow rapidly, while others continue to fall apart. If the economy remains stagnant through the decade, the decade-risk is 42.1%. If, instead, the economy 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 being 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 favoured by the World Bank is its Country Policy and Institutional Assessment

⁴ Growth rates are expressed in decimals throughout the analysis.

⁵ To reduce the problem of endogeneity, we lag the growth rate by one year.

(CPIA). A high CPIA rating is generally associated with faster growth and, in the post-conflict context, its effect on growth is atypically strong (Collier & Hoeffler, 2004a). 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.⁶ 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.

Political Variables

We next turn to the political variables.⁷ 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, located 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.⁸ Apart from 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, risks of further violence are likely to substantially increase, and so other measures will be needed to offset this effect. The second implication is 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 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 coefficients but

⁶ The CPIA variable was made available to us by the LICUS Unit of the World Bank.

⁷ Sometimes there are missing data on these variables. Rather than lose observations, we set missing observations to 0 and introduce a dummy variable which takes the value of 1 if the data are missing. See Greene (2003: 60) for details on this procedure, known as a modified zero-order regression. The estimates of the coefficients on the dummies for missing values are of little interest (see Collier, Hoeffler & Söderbom, 2004, for details), and we do not comment on them here.

⁸ Countries that Polity counts as 'in transition' (coded as -66, -77 or -88) are coded as missing democracy data.

with opposite signs 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 we distinguish between the first election and subsequent elections, since there is speculation in the practitioner literature that this distinction is important (Table I, column 2). If anything, it is the adverse effect of elections in the year following the election that is significant, rather than the favourable effect in the year of the election. However, both for the first election and subsequent elections, the pattern is similar: a favourable 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.

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.⁹ 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, such elections 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 granted only in situations that are too demanding for hopes of a unitary state 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 regression, it is significant only 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 have not found any to be even marginally significant. In Table I, we report one such variant, an index of economic freedom.

Social Variables

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 I, we report the

⁹ 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.

most familiar measure, ethnic diversity. Like the other measures, this is insignificant, but, to the extent that it has an effect, it is favourable: societies that are more diverse have lower risks.

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 article, 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 the risk from 40% to 32.8%.

Military Variables

Finally, we introduce military variables. Recall that military spending by the post-conflict government has been found to be counterproductive (Collier & 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 the effect is far more significant when expenditure is 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 that takes the value of 1 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. Therefore, we enter the expenditure on peacekeepers directly as an explanatory variable, recognizing that there are remaining dangers of endogeneity.¹⁰ 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

¹⁰ Sambanis (2008) examines the endogeneity of UN interventions. His IV estimations indicate that the impact of UN interventions is similar to the one obtained from the uninstrumented regression models. He tentatively concludes '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.

appeared to be increasing the risk of peace collapse. An apparently unfavourable effect of peacekeepers might therefore be spurious, and an apparently favourable effect is likely to be biased downwards.

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 that 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 backburner, 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, 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.¹¹ 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 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-reductions that economic reconstruction and military peacekeeping provide are likely to be very cost-effective (Collier & Hoeffler, 2004c).

Conclusion and Implications

In this article, 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 reducing them.

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 licence 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 overemphasize political

¹¹ In our sample, the median growth rate is 2.3% and the mean is 1.5%. Zero growth rate is at the 25th percentile in the sample distribution, and 10% growth is at the 95th percentile.

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, as 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 this article, we have 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 that 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 it would 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 Peacebuilding 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 by appropriate contextual knowledge, before being applied in any particular situation. There are limits to how much the past can be a guide to the future, and there are even stricter limits 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.

Appendix A. Sample of Post-Conflict Periods

<i>Country</i>	<i>Start of war</i>	<i>End of war / Start of peace</i>	<i>End of recorded peace period</i>	<i>Duration of recorded peace period (years)</i>	<i>Censored peace period? (0 = yes, 1 = no)</i>
Algeria	28-Jul-62	15-Jan-63	07-Feb-92	29.1	1
Algeria	07-Feb-92	31-Dec-00	31-Dec-02	2.0	0
Angola	11-Nov-75	31-May-91	28-Oct-92	1.4	1
Angola	28-Oct-92	22-Nov-94	31-Dec-02	8.1	0
Azerbaijan	25-Dec-91	27-Jul-94	31-Dec-02	8.4	0
Bosnia and Herzegovina	01-May-91	21-Nov-95	31-Dec-02	7.1	0
Burundi	30-Apr-72	25-May-72	18-Aug-88	16.2	1
Burundi	18-Aug-88	22-Aug-88	23-Nov-91	3.3	1
Burundi	23-Nov-91	31-Dec-92	21-Oct-93	0.8	1
Burundi	21-Oct-93	31-Dec-98	01-Jan-00	1.0	1
Cambodia	29-Jan-93	01-Jul-97	31-Dec-02	5.5	0
Cameroon	01-Jan-60	31-Dec-61	31-Dec-02	41.0	0
Chad	01-Nov-66	16-Jun-71	22-Mar-80	8.8	1
Chad	22-Mar-80	07-Aug-88	01-Jan-98	9.4	1
Chad	01-Jan-98	31-Dec-01	31-Dec-02	1.0	0
Chile	11-Sep-73	15-Sep-73	31-Dec-02	29.3	0
China	15-Jan-67	01-Sep-68	31-Dec-02	34.4	0
Colombia	15-Sep-49	31-Dec-62	15-Mar-84	21.2	1
Colombia	15-Mar-84	31-Dec-93	01-Jan-98	4.0	1
Congo, Dem. Rep.	04-Jul-60	01-Sep-65	28-Jan-93	27.4	1
Congo, Dem. Rep.	28-Jan-93	04-Feb-93	08-Oct-96	3.7	1
Congo, Dem. Rep.	08-Oct-96	31-Dec-00	31-Dec-02	2.0	0
Congo, Rep.	05-Jun-97	31-Dec-99	31-Dec-02	3.0	0
Dominican Republic	25-Apr-65	01-Sep-65	31-Dec-02	37.4	0
El Salvador	01-Jul-79	01-Feb-92	31-Dec-02	10.9	0
Ethiopia	01-Jan-74	28-May-91	31-Dec-02	11.6	0
Georgia	25-Dec-91	14-May-94	31-Dec-02	8.6	0
Guatemala	01-Oct-66	12-Jul-72	12-Mar-78	5.7	1
Guatemala	12-Mar-78	13-Apr-84	31-Dec-02	18.7	0
Guinea-Bissau	01-Jan-98	31-Dec-98	31-Dec-02	4.0	0
India	01-Jan-85	31-Dec-93	01-Jan-99	5.0	1
Indonesia	15-Dec-56	31-Dec-60	31-Dec-02	42.0	0
Iran, Islamic Rep.	03-Sep-78	31-Dec-79	06-Jun-81	1.4	1
Iran, Islamic Rep.	06-Jun-81	03-May-82	31-Dec-02	20.7	0
Jordan	17-Sep-70	24-Sep-70	31-Dec-02	32.3	0
Lao PDR	19-Apr-63	15-Feb-73	31-Dec-02	29.9	0
Lebanon	13-Apr-75	13-Oct-90	31-Dec-02	12.2	0
Liberia	01-Dec-89	28-Nov-90	15-Oct-92	1.9	1
Liberia	15-Oct-92	19-Aug-95	05-Apr-96	0.6	1
Liberia	05-Apr-96	20-Aug-96	31-Dec-02	6.4	0
Mozambique	21-Oct-79	04-Oct-92	31-Dec-02	10.2	0
Nicaragua	01-Oct-78	18-Jul-79	18-Mar-82	2.7	1
Nicaragua	18-Mar-82	19-Apr-90	31-Dec-02	12.7	0
Nigeria	06-Jul-67	12-Jan-70	18-Dec-80	10.9	1
Nigeria	18-Dec-80	01-Jan-81	02-Feb-84	3.1	1

(Continued)

Appendix A. (Continued)

<i>Country</i>	<i>Start of war</i>	<i>End of war / Start of peace</i>	<i>End of recorded peace period</i>	<i>Duration of recorded peace period (years)</i>	<i>Censored peace period? (0 = yes, 1 = no)</i>
Nigeria	02-Feb-84	04-Mar-84	31-Dec-02	18.8	0
Pakistan	25-Mar-71	02-Dec-71	23-Jan-73	1.1	1
Pakistan	23-Jan-73	31-Jul-77	04-Nov-94	17.3	1
Pakistan	04-Nov-94	31-Dec-95	31-Dec-02	7.0	0
Peru	04-Mar-82	31-Dec-95	31-Dec-02	7.0	0
Philippines	01-Jan-72	31-Dec-92	01-Jan-00	7.0	1
Philippines	01-Jan-00	31-Dec-01	31-Dec-02	1.0	0
Romania	21-Dec-89	22-Dec-89	31-Dec-02	13.0	0
Russian Federation	11-Dec-94	30-Apr-96	01-Jan-98	1.7	1
Russian Federation	01-Jan-98	31-Dec-01	31-Dec-02	1.0	0
Rwanda	15-Nov-63	06-Feb-64	30-Sep-90	26.7	1
Rwanda	30-Sep-90	04-Aug-93	06-Apr-94	0.7	1
Rwanda	06-Apr-94	18-Jul-94	01-Jan-98	3.5	1
Rwanda	01-Jan-98	31-Dec-98	31-Dec-02	4.0	0
Serbia and Montenegro	01-May-91	03-Jan-92	31-Dec-02	11.0	0
Sierra Leone	23-Mar-91	23-Apr-96	01-Jan-98	1.7	1
Sierra Leone	01-Jan-98	31-Dec-00	31-Dec-02	2.0	0
South Africa	01-Jan-89	31-Dec-93	31-Dec-02	9.0	0
Sri Lanka	06-Apr-71	16-May-71	25-Jul-83	12.2	1
Sri Lanka	25-Jul-83	31-Dec-86	25-Jul-87	0.6	1
Sri Lanka	25-Jul-87	24-May-90	31-Dec-02	12.6	0
Sudan	01-Oct-63	28-Feb-72	17-Nov-83	11.7	1
Sudan	17-Nov-83	31-Dec-92	01-Jan-95	2.0	1
Tajikistan	01-May-92	31-Dec-97	31-Dec-02	5.0	0
Thailand	01-Jan-70	31-Oct-73	31-Dec-02	29.2	0
Uganda	08-Oct-80	24-Apr-88	08-Feb-96	7.8	1
Uganda	08-Feb-96	31-Dec-01	31-Dec-02	1.0	0
Vietnam	01-Jan-60	06-Feb-65	31-Dec-02	37.9	0
Zimbabwe	28-Dec-72	28-Dec-79	31-Dec-02	23.0	0

Peace periods are censored at 31-Dec-02, or earlier if information on explanatory variables is missing.

Appendix B. 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 and (4) Public sector management. The CPIA variable was made

available to us by the LICUS Unit of the World Bank. Until recently, CPIA scores were not publicly available; only since 2005 are the scores listed in the World Development Indicators.

Democracy 'Democracy' is a dummy which takes a value of 1 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 USA and divided these numbers by the total population in the

country of origin. Sources: US Census; US Yearbook of Immigration Statistics (2004).

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

Economic Growth Using World Bank (2005) data for GDP per capita we calculated the annual growth rates.

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 1 minus the Herfindahl index of group shares, and it 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>.

GDP Per Capita We measure GDP per capita annually. Data are measured in constant 1995 US dollars, and the data source is World Bank (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.

Regional Autonomy Autonomous regions are coded as a 0/1 dummy. An autonomous region is recorded if a source explicitly mentions a region, area or district that is autonomous or self-governing. Autonomous regions must be contiguous with the country to which they belonged, on the presumption that such regions would be more likely to impose a check on central government decisionmaking than would non-contiguous regions. Furthermore, they must be constitutionally designated as 'autonomous' or 'independent' or 'special'. Federal Districts or Capital Districts do not count as autonomous regions. Disputed autonomy is not recorded. Source: Beck et al. (2001).

UN Expenditure UN via World Bank: data available from the authors.

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