The Political Economy of Power--Sharing

George Tridimas

Comments most welcome
Preliminary and incomplete
Please treat accordingly

Date: November 2009

Abstract

The paper analyses why office-motivated political rivals may agree to give up a violent fight to control the government and share power on the basis of an election outcome in a proportional representation system. As the outcome of both conflict and elections are uncertain, for each rational player the choice depends on which setting secures the highest expected net payoff. Adopting the methodology of the economics of conflict the analysis identifies that the effectiveness of election campaigning relative to the effectiveness of fighting a war of the adversaries, the size of the benefits from office and the proportion of those benefits destroyed by fighting are of crucial importance in accepting power-sharing.

JEL Classification: D72 (Economic Models of Political Processes: Rent-Seeking, Elections, Legislatures, and Voting Behavior); D74 (Conflict; Conflict Resolution); H56 (National security and war)

Key words: Power-sharing, consociational theory, post-civil-war democratisation, non-majoritarian institutions, proportional representation, risk aversion, split-the-surplus formula
The Political Economy of Power–Sharing

1 Introduction

Power-sharing is an arrangement by which warring political factions jointly exercise the power of office rather than fighting violently against each other. Currently, there are several headline-grabbing examples of power-sharing of varying success, including amongst others Iraq, Kenya, Lebanon, Northern Ireland and Zimbabwe. Power-sharing and consociational government is often seen as offering a most promising mechanism to manage conflict in societies divided along ethnic, racial, religious and linguistic lines and build peace and democracy. Noble ideals of avoiding bloodshed and establishing democracy offer obvious reasons and powerful motives why one may wish to introduce power-sharing institutions. But policy making according to power-sharing arrangements requires the agreement of all rival factions, including those who may feel that they stand a better chance to win a war than an election. Why would a utility maximising political actor decide to lay down his weapons and abide by the rules of democratic politics?

One may think that in a homogeneous society under a democratic polity, where each political party stands a fair chance to win an election, it is legitimate for the winning majority coalition to earn the right to pursue its preferred policy in a “winner-takes-all” division of the spoils of electoral victory. However, if the electorate is divided along racial, ethnic, religious, linguistic or cultural differences so that one community enjoys an inbuilt majority by virtue of its greater number of members, collective decisions based on simple majority rule may systematically privilege the larger community and permanently exclude the minority from office. In such a setting simple majority rule outcomes may be viewed as illegitimate by the losing minority. A sense of injustice and related grievances may then lead the minority community to take up arms against their “oppressors” and

---

1 In truth, the policy making authority of the majority in a democracy is not unfettered but subject to various non-majoritarian constitutional restrictions; for example, legislative acts and policy measures which violate the constitution can be annulled by the judiciary (for a recent survey see Tridimas (2009) and the literature cited therein for the issue of constitutional review of policy).
seek to take over the state or secede. Violent conflict and civil war certainly cost lives and property to both rival communities, while its outcome is uncertain. Under power-sharing, the electoral majority shares power with the defeated minority and the agreement required to reach decisions generates more moderate outcomes in comparison to a rule which allows decision making to be concentrated in the hands of a single political party.

The present study analyses under what circumstances the rivals find in their interest to share power and abide by electoral politics instead of waging war, and leaves the question of the consequences of power-sharing on policy outcomes for further investigation. Power-sharing mechanisms divide and balance power among rival groups with the aim to minimise the risk that one group will dominate the others and threaten their security and very existence. To put it another way, power-sharing is a form of insurance against the losses that a minority may suffer when the majority rules. Whether or not rational political players respect the power-sharing agreement and abide by its rules depends on whether it is credible, so that its provisions are enforced, and whether it secures a higher expected payoff for all players than the alternative of going to war. Credibility depends, amongst other things, on implementation mechanisms, like the presence of a “higher authority”, like a foreign power, trusted by both parties which has the resources and the will to enforce the terms of the agreement, or in the absence of such an agent, a self-enforcement mechanism, as for example when the two adversaries give up their weapons, integrate their military wings to a united defence force, a single police force and set up an independent judiciary. What exactly determines the payoff of power-sharing, given its enforceability, and whether it is preferable to the alternative of a war, which may altogether eliminate the rival, or indeed standard democratic practice where majority rule prevails, is the focus of the present study. Note that in the tradition of political economy the issue is not approached as a question of avoiding war and adopting democracy for normative reasons, but for self-interest.

The paper is structured as follows. The next section discusses the relation of the present study to various strands of literature on civil war and power-sharing in democratic government. Given the voluminous literature, the discussion can only be selective and
offer a brief overview of the economic analysis of conflict and civil war and of electoral rules and coalition government formation. By way of an example of the workings of a power-sharing arrangement, it also provides a brief description of the 1998 peace agreement in Northern Ireland to bridge the division between Unionist-Protestants and Republican-Catholics. Section 3 introduces the conceptual framework and invoking first the assumption of risk neutrality, the standard treatment in the economics of conflict, analyses the choices of the participants in a conflict between war and power-sharing. It then extends the analysis to the case of risk aversion and studies when the civil war participants give up violent conflict and adopt democratic politics with either proportional representation or majoritarian rule. Section 4 concludes.

2 Relation to the literature – a selective review of civil war and power-sharing

Wars are ex post inefficient. The rival sides would be better off if they could avoid the cost of arming and the destruction of life and property from war. The present study relates to several partially overlapping strands of an enormous political science and economics literature regarding economic analysis of conflict and more specifically of civil war, post-civil-war resolution and the debate between consociation and centripetal form of government, and policy making under proportional representation. What follows is a selective discussion of some of the themes taken up by this literature.

(A) Civil War

The first branch of studies relates to a growing economic literature on war based on game theory. The economic analysis of war uses the insights of the theory of incomplete contracting and conflict (Hirshleifer, 1995): When it is in their interests, the participants are not able to make commitments that they will not engage in war against each other. After scrutinising a number of theoretical claims, Fearon (1995) concludes that there are three rational explanations of war. (1) Incomplete information and strategic misrepresentation. That is, leaders who go to war may have private but incomplete information about the ability and willingness to fight of their own country relative to the
opponent and may have strategic incentives to misrepresent such ability and willingness in order to gain a better deal. On the same train of thought, waging war may act as a signal about willingness to fight and as a credible show of military strength. 2 

Inability to commit. Rival powers may be unable to commit credibly to peace because of strong incentives to renege on a bargain (even though there are no problems of information asymmetry or strategic misrepresentation). This is likely under three circumstances, namely, when a pre-emptive war increases the chances that a side has a better chance to win decisively; when a preventive war increases the chances that a side will not be strong enough to mount an attack in the future; and when a side cannot be trusted that if it is offered a concession it will not demand more at a later stage (a case of failure of appeasement). 3

(3) Indivisibility of the issue in dispute. Some issues may be indivisible; for example, who sits on the throne, or who has authority over a territory. In this case, the disputants may consider the issue at hand as a binary variable, all-or-nothing, and therefore are not able to negotiate a mutually beneficial division of it, nor negotiate transfer payments which would result in a peaceful resolution. Powell (2006) argues that indivisibilities should really be seen as a commitment problem, and observes that despite the insights gained by models based on incomplete information, “war comes when a state becomes convinced that it is facing an adversary it would rather fight than accommodate” (p.194). On the other hand assuming that the adversaries have the same information makes possible to identify how inability to commit leads to fighting.

Looking more specifically at civil wars, Grossman (1991) presents an economic model of insurrection, where labour time is divided between production, soldiering for the lawful government and insurrection and depends on the technology of conflict, while Gershenson and Grossman (2000) examine civil wars in a setting where adversaries attach different values on being politically dominant and study whether civil conflict ends when the challenger becomes dominant or it never ends. 3 Collier and Hoeffler (2007)

2 Bester and Warneryd (2006) analyse settings where one side underestimates the strength the other as a result of which war erupts.

3 See also Sambanis (2004) for a critical review and synthesis of the many interesting questions regarding what constitutes and what causes civil war, “greed” or “grievance” and misperception of opportunities.
offer an overview of the insights brought by economic theory and econometrics on the causes, duration, consequences and costs of civil war. Several issues are identified and reviewed: The most common causes seem to be ethnic and religious divisions and social and income inequality. Civil wars also seem to last ten times longer than international wars; their direct cost of destruction is compounded by capital flight and economic decline, higher mortality, adverse effects on human health, deterioration of political institutions and human rights and a high risk of renewed hostilities. Garfinkel and Skaperdas (2007) survey the theoretical work on the economics of conflict. Conflict arises when property rights are neither perfectly nor costlessly enforced, and identify, amongst other issues, how conflict may impact on the distribution of output (which is equated to power) and the conditions conducive to settlement.

Summarising earlier contributions on civil war Skaperdas (2008) starts from the premise that divisions which arise as a result of geography (where the central government finds difficult to control remote areas and inhospitable territories), ethnic differences, sharp economic and social changes, the dissolution of existing states and the creation of new ones, intervention by external powers which break the existing order (geopolitics) and the pursuit of rents may create a power vacuum which can be filled by rival groups fighting against each other rather than negotiating. This fighting may break out because the groups are imperfectly informed about their fighting capabilities and opportunities, but perhaps more interestingly, even when they are fully informed, because the long-run expected payoffs from fighting exceed the short-term incentives to compromise, since by fighting now and vanquishing one’s opponent the victor will no longer need to arm and fight a future war.

Looking specifically at power-sharing Wantchekon (2000) uses a game theoretic model to show how credible power-sharing institutions are necessary for stopping a civil war and persuading rival political players to adopt democratic institutions, and that
arrangements such as integration of the military wings of the warring factions and the guarantee of positions in civil service to all parties enhance the credibility of the mechanism to enforce the peace deal. Wantchekon and Neeman (2002) and Wantchekon (2004) distinguish between civil wars which end up by establishing a democratic polity and those that do not and show that a negotiated settlement is more likely when government revenue depends mainly on private investment rather than natural resources or foreign aid, no decisive winner emerges from the war and the warring factions demilitarise. Further, Brams and Kilgour (2008) examine the stability of power-sharing agreements. In their model the division of the rents from office is exogenous rather than determined by the election outcome. Using both one-shot and repeated game settings they examine the circumstances under which each player will attack first, where (contrary to the present work) the probability of defeating the opponent as exogenous and they show that the loss from conflict mitigates the incentive to start a shooting war but does not eliminate it completely.

A distinct line of statistical research on civil wars relates to the use of power-sharing institutions to end a civil war and secure democracy in a divided society. For example, in a much quoted study Licklider (1995) first observes that a civil war is more intense and more difficult to resolve than a war between two sovereign states because the stakes are higher, in the sense that after the violence ends the combatants still have to live in the same country, and because often there is no institution to enforce agreements between the combatants. Using an international sample of 91 post-1945 civil wars he finds that a negotiated settlement is more likely to break down than a settlement based on the military victory of one of the participants because a negotiated settlement creates a structure of decision making power which prevents the government to function effectively. In addition, civil wars regarding identity issues (like ethnic, religious, racial and linguistic differences) are more difficult to resolve by peace agreements than conflicts regarding politico-economic issues. Doyle and Sambanis (2000) using 124 post WWII civil wars present evidence that peace-keeping operations supported by substantial international (UN) financial assistance help sustain peace and support democracy, especially after long, not very costly, non-identity civil wars in relatively developed countries. Hartzell
and Hoddie (2003) find that of the civil wars which are resolved peacefully by compromise, those which end with more extensive power-sharing arrangements (encompassing sharing of political, military, territorial and economic powers) are more likely to result in an enduring post civil war peace, and so does the presence of a third-party enforcer, for they make the adversaries feel more secure in the negotiated settlement. Gurses and Mason (2008) find support for the hypotheses that civil wars which end in negotiated settlements rather than clear military victories by government or insurgents are more likely to lead to democratic politics, while civil wars triggered by the wish of a group to preserve its ethnic or religious identity are less likely to do so. However, contrary to Doyle and Sambanis (2000), they do not find any significant support for the argument that peace keeping operations lead to higher levels of democracy.  

**(B) Power-sharing mechanisms**

The second strand of literature relates to organisational forms in post-conflict societies. The theory of consociational government, developed by Lijphart (1984 and 1999), investigates how peace and democracy can be built in a society afflicted by deep divisions and violent conflict. Forming a government and formulating policies which command support from the opposing communities, rules out the use of majoritarian electoral systems; instead it requires the adoption of institutions which will achieve cross-community consensus. Consociational government includes mechanisms to share political and military power, divide economic resources, guarantees of the security of participants into the arrangement by third parties, retributive justice, typically in the form of an amnesty, and restorative justice, typically in the form of repatriation of displaced civilians and guarantees that some basic rights will be respected and protected. Sharing

---

4 Gurses and Mason (2008) attribute the divergence to their use of a continuous rather than a binary measure of democracy, for controlling for the pre civil war level of democracy and for taking into account whether the civil war ended with a government or rebel victory.

5 The list of countries which at some point in time or still operate some form or other of consociational arrangements comprises cases of both developed and developing nations across the world; examples include Austria, Canada, Colombia, Cyprus, the European Union, Fiji, India, Malaysia, the Netherlands, South Africa and Switzerland; see Lijphart (2004).
political power consists of a number of components namely, executive power-sharing, where each of the main communities participates in an executive formed on the basis of representative government; proportionality, meaning that each community is represented proportionally in key public institutions and is a proportional beneficiary of public resources and expenditures; veto-rights, where each community has the power to veto policy measures which may harm its interests and self-government, where each community enjoys some distinct measure of autonomy, particularly self-government in matters of cultural concern.

However, power-sharing is not a without its problems. The inclusion of opposing sides in the executive may decrease competition, reduce political accountability, slow down decision taking and implementation, and discourage the search for new ideas and policies. Moreover, a power-sharing arrangement, which requires parties to declare themselves on the basis of the political / ethnic group they represent may aggravate rather mitigate divisions. In contrast to consociation, the centripetal (or incentive, or integration) view of Horowitz (2000 and 2008) argues for institutions which encourage politicians to reach out across identity boundaries, for policies to promote social integration and increase public expenditure to redress sectarian differences. It envisages a system of electoral incentives designed to appeal to parties which will moderate their ethnic stance and appeal to voters from both sides of the inter-community divide like a presidential system.

(C) Proportional representation and coalition government

As already said, an important component of power sharing is the application of a proportional representation electoral rule, as opposed to majoritarian. It is well established that the two systems yield different equilibrium policies. Majoritarian electoral systems offer voters clear choices among competing political parties, but may fail to represent fully the entire spectrum of voter preferences, and typically lead to single party government. On the other hand, electoral systems based on proportional representation produce a multi-party system reflecting a multitude of interests and
ideological objectives. Thus, they may be able to represent different policy preferences, but result in no single party having a majority of parliamentary seats and lead to the formation of a coalition government and power-sharing which makes more difficult to identify any single party as responsible for policy choices. Mueller (2003) offers an introduction to the voluminous literature developed to examine different formulas of proportional representation for allocating parliamentary seats, the related questions of the effective number of parties, the factors expected to affect the composition of the winning coalition of parties, the equilibrium set of policies in multi-dimensional space, the stability of the government and the incentives of voters to vote strategically for parties which stand a better chance to be elected to parliament.

In multi-party parliamentary democracies, the parties which form the government, the allocation of portfolios and the policies to be implemented are decided by bargaining parties in parliament whose electoral strength is determined by their vote shares, which in turn depend on how voters vote for the platforms proposed. Formally, voting in elections, government formation by political parties and policy decisions is analysed as a multi-stage game. In explaining coalition government formation two sets of factors are deemed as important (see Martin and Stevenson, 2001, for a review and empirical tests). First, the size of a party in terms of number of parliamentary seats won, and its ideology. Second, institutional structures, that is, formal rules and procedures which define the formateur (the party and political leader with the power to propose a coalition government over which negotiation will take place); the power or lack thereof of the incumbent to call an election; the reversion point which will prevail if the negotiation to form a coalition fails; the investiture rule (the formal requirement to obtain a majority vote in parliament instead of forming a minority government which seeks ad hoc parliamentary votes for proposed policies); and norms of behaviour, like pre-electoral commitments to form coalition government only with parties with related ideological

---


7 Extensive treatments are found in the works of amongst others Cox (1990) and Lijphart (1994), while Myerson (1999) and (2004) offers surveys.
objectives and exclude parties with opposing ones. The literature has studied two procedures by which political parties, or more specifically, a politician is selected to try and form a coalition government upon bargaining with other parties holding parliamentary seats. According to the first parties are selected to form a government in accordance to their share of parliamentary seats, that is, first the party with the highest number of parliamentary seats, then the one with the second highest and so on, see Austen-Smith and Banks (1988). The second postulates that the selection is probabilistic (rather than deterministic) and the probability of being called to form a government is higher the larger the number of parliamentary seats occupied, see Baron and Ferejohn (1988) and Baron and Diermeier (2001). 

A further related question of interest is whether power-sharing arrangements result in moderate policy declarations and moderate policies parties. Specifically, when parties are divided along the left – right dimension and are policy motivated, parties of both the left and the right face a trade-off to either advocate their policy preferences at the risk of obtaining only moderate voter support, or moderate their policy proposals to increase support and hence policy influence in a post-election coalition government. In this framework Merrill and Adams (2007) show that when voters support the party whose policy programme best reflects their policy preferences power-sharing arrangements do not make parties more or less extreme in comparison to arrangements where a single party dominates decision making. In accordance with the theoretical arguments that power-sharing fosters political compromise and moderation, previous empirical studies drawing on western peaceful democracies concluded that power-sharing leads to more moderate policies than arrangements which allow a single party to exercise power and that such policies reflect closer the preferences of the median voter (see for example McDonald et al. 2004, and Budge and McDonald, 2006). However, when voters take into account that under power-sharing arrangements any party represented in parliament can influence government policy only partly, they and the parties they support will adopt more extreme policy positions in order to shift the policy decisions towards their

---

8 Using data from 11 parliamentary democracies applying PR rules Diermeier and Merlo (2004) find stronger statistical support for the former, rather than the latter, but they also that a combination of these two bargaining procedures explains the data even better.
preferences. It follows that power-sharing and proportional representation may change the incentives of parties and voters as it creates new opportunities to challenge the existing dominant parties and even replace them with new ones.

(D) An example: Power-sharing in Northern Ireland

By way of illustration of what is involved in consociation and power-sharing, this subsection briefly describes the Northern Ireland power-sharing institutions established by the Peace Agreement, also known as the “Good Friday Agreement”, of 10 April 1998 aiming to end 30 years of “low intensity civil war” between Unionist-Protestants and Republican-Catholics. Amongst other institutions, the Agreement established the ‘New Northern Ireland Assembly’, whose members are elected under the Single Transferable Vote system. The Assembly has full legislative and executive authority for all matters that are the responsibility of the Northern Ireland Government Departments. These include the office of the first minister and deputy first minister, who must stand for election jointly, and to be elected they must have cross-community support by the parallel consent formula, which means that a majority of both the Assembly Members who have designated themselves Nationalists and those who have designated themselves Unionists and a majority of the whole Assembly, must vote in favour; agriculture; culture; education; employment; enterprise; environment; finance; health; and regional and social development; it excludes matters which remain the responsibility of the Westminster Parliament. Parties with links to paramilitary organisations were allowed a place on the executive only after such organisations decommissioned their weapons. The parties elected to the Assembly choose ministerial portfolios and select Ministers in proportion to their party strength. Each party has a designated nominating officer and the d’Hondte procedure is used for the appointment of Ministers.

Looking at the circumstances conducive to power-sharing, Evans and O’Leary (2000) write “Consociation ... works best where communities wish to maintain their differences without having strong integrationist or assimilationist ambitions towards the respective others; where there is an existing (or emerging) balance of power between communities; where no community can successfully control or conquer the others through war; and
where external parties to the region promote accommodation rather than antagonism. Arguably these conditions are emerging in Northern Ireland.” Coakley (2008) charts the competition between two ethnically based dominant parties from the 1880s to the 1970s under a plurality electoral system, and since then the intra-communal fragmentation of this system following the introduction of major institutional reforms, including proportional representation, which allowed successful “ethnic outbidding” from inside the ethnic base of each party and worked against those parties that sought to mobilise the uncommitted centre as well as against the parties which sought to redefine political competition in terms of non-ethnic issues. Extended analysis of the nature of the 1998 Peace Agreement can be found in among others McGarry and O’Leary (2006a and 2006b), who are critical supporters of the consociation view, Horowitz (2001) and (2002) and Tilley et al. (2008) and the literature cited therein. Tilley et al. (ibid) document how the emergence of a consociational form of government has changed party competition and led to the more extreme parties on both sides of the division, the Democratic Unionist Party and the Sin Fein, claiming the largest electorate support after both the 2003 and 2007 elections, a polarising trend in the post-agreement environment.

3  Equilibrium outcomes under conflict and power-sharing

(A) Preliminaries

The focus of this study is the circumstances when two opposing political groups choose to end a violent conflict and agree to share power according to the outcome of a democratic election. In discussing the benefits of peace compared to war the economics of conflict literature models war as a costly lottery and the peaceful settlement as an offer by one of the combatants to transfer part of the disputed resource to the other side, so that at least one Combatant is ex ante better off with the transfer of resource rather than the probabilistic outcome of the war, and the other is ex ante indifferent between the transfer and the fight. In this setting the transfer equilibrium is a deterministic outcome where each side receives a share of what is under dispute and the benefits of a peaceful resolution are clear to see. It may be an appropriate modelling framework in, for
example, disputes over a territory or a resource. However, it does not capture the essence of the peaceful resolution of a civil war, which (rather than ending with the break-up of a country into different states) is settled with an agreement by the two opposing sides to disarm, hold elections and set up political arrangements to share power in the post election government, so that the election loser is assured to receive a number of seats in the cabinet, budgetary resources and various guarantees to respect rights and freedoms. It is this kind of arrangement we investigate in the present paper. Like the war outcome, the election outcome is again probabilistic, but it depends on different factors than those required to win a war, while it avoids the destruction concomitant with war.

We consider a setting with two rival players, $A$ and $B$, based on two rival groups of a divided population which compete for office and the rents which are gained upon ascending to power. We abstract from intra-group collective choice issues and each player is treated as a unitary actor, so that $A$ and $B$ can be thought as the leaders of two rival groups. The winner of the contest for office receives a rent $R$ which is assumed to be exogenous. Following civil war modeling, the present investigation confines attention to economic rents only and leaves other objectives for future study.  

There are two ways to gain office and obtain the rents; first, by winning a violent conflict like a civil war; second, by winning an election contest.

However, war is ex post inefficient. A violent conflict results in severe destruction which is modelled as reducing the rent available by a proportion $1<\theta<0$, so that the victor’s gain from the war is $(1-\theta)R$, while the defeated gets nothing. On the other hand, no such losses are suffered when office is contested in an election. Let $Q$ be the probability that $A$ defeats $B$ in a civil war; the probability then that $B$ defeats $A$ is $1-Q$. If as in the standard treatment of the economics of conflict the two players are assumed to be risk neutral then

---

9 Since $R$ represents a monetary value it is also reasonable to assume that both $A$ and $B$ value it equally. Further, the assumption of exogenous rent implies that the rent from office is independent of the size of tax revenue and thence economic output. This is made by the necessity of observing the ceteris paribus condition, since the paper focuses on the institutional set-up per se and leaves aside complications arising of how the size and excess burden of taxation and public expenditure, may vary under office holders politicians who are in government by the force of arms or by electoral procedures.
A’s and B’s expected benefits of from winning the election are respectively $QR$ and $(1-Q)R$. On the other hand, if the two players are risk averse, as for example when the utility with respect to rents is logarithmic $U_i = \ln R$, $i=A,B$, the expected benefits are $U_A = Q\ln R$ and $U_B = (1-Q)\ln R$.

No rent destruction occurs when office is contested in an election ($\theta=0$). Let $P$ and $1-P$ denote the probabilities that $A$ and $B$ respectively win the election. Under a majoritarian electoral rule the winner takes all the rent with a probability equal to the probability of winning the election (which is equal to its share of the votes), while under a proportional representation rule each party takes a share of the rent equal to its probability of winning the election. If the players are risk neutral the expected benefits of $A$ and $B$ from the election are respectively $PR$ and $(1-P)R$ irrespective of whether the electoral rule is majoritarian or proportional representation.

The equality of the expected benefits from the majoritarian and proportional representation rule under risk aversion creates a serious analytical problem since in practice proportional representation is an integral part of power-sharing agreements. We propose to overcome this problem by modelling a power-sharing arrangement as a post-election settlement where the election the winner is rewarded with a fraction of office rents $1-k$, and the loser is given the remaining fraction $k$. Typically, as the election winner occupies the top office of president, or prime minister, and is allocated the largest share of cabinet posts and budgetary sums we assume that $0 \leq k \leq \frac{1}{2}$. The expected benefits of $A$ and $B$ therefore are respectively written as $U_A = P(1-k)R + (1-P)kR$ and $U_B = (1-P)(1-k)R + PkR$. We then proceed to study power-sharing under the standard assumption of risk neutrality by employing the previous formulation, while the following section explores power-sharing under risk aversion.
However, when the two players are risk averse, the two electoral rules produce different expected benefits. Assuming again for example that utility is logarithmic, under a majoritarian election rule, the expected benefits are $U_A = P \ln R$ and $U_B = (1-P) \ln R$, while under proportional representation, the expected benefits are $U_A = \ln PR$ and $U_B = \ln (1-P)R$. Adopting Fearon’s (1995) template, both specifications used serve to show that power-sharing emerges as a mechanism to transform the indivisible variable over which inefficient fighting takes place into a divisible variable over which compromise is possible.

(B) Conflict and power-sharing under risk neutrality

Let the expenditures to finance the effort, weapons and other activities associated with fighting a civil war by the two factions be $Z_A$ and $Z_B$ respectively. Following standard practice, the probability $Q$ of civil war victory is modelled as dependent positively on A’s expenditure for war effort and negatively on that of B’s according to the usual contest success function (see Tullock, 1980, Hirshleifer, 1989, and Garfinkel and Skaperdas, 2007); specifically

$$Q = \frac{\gamma Z_A}{\gamma Z_A + (1-\gamma)Z_B}$$

(1)

Parameters $0 \leq \gamma \leq 1$ and $0 \leq 1-\gamma \leq 1$ measure the effectiveness of A and B respectively in fighting the civil war. It captures in a simplified way that the two sides of the conflict may differ in their fighting ability, with one having access to better hardware, technology and organization (typically the government) while the other relying on its knowledge of terrain and commitment of its members. If it is assumed that $A$ is a more effective fighter than $B$, as it may rely on professional army and security services, in which case $\gamma > \frac{1}{2}$ and $\frac{1}{2} < 1-\gamma$. When the two sides are equally effective fighters, $\gamma = 1-\gamma = \frac{1}{2}$, and spend equal sums of resources to fight the civil war, $Z_A = Z_B$, they stand an equal probability of

\[\text{Skaperdas (1991) also examines the effects of risk attitude. He assumes that the two participants have different attitudes towards risk, while the present inquiry assumes that both participants have identical risk attitudes, either neutrality or aversion.}\]
success, that is, $Q = 1 - Q = \frac{1}{2}$. Under risk neutrality the expected net payoffs of the two rival factions from fighting civil war are written as $^{11}$

\[
U_A^W = Q(1 - \theta)R - Z_A \\
U_B^W = (1 - Q)(1 - \theta)R - Z_B
\]  

(2.A)  

(2.B)

Let $X_A$ and $X_B$ be the election campaign expenditures of the two groups. In common with $Q$, the probability $P$ that $A$ wins the election is modelled as increasing in the resources spent by $A$ campaigning and decreasing in those of $B$ as described by the equation

\[
P = \frac{\varepsilon X_A}{\varepsilon X_A + (1 - \varepsilon)X_B}
\]  

(3)

As above, parameters $0 \leq \varepsilon \leq 1$ and $0 \leq 1 - \varepsilon \leq 1$ measure the effectiveness of $A$ and $B$ respectively, in their election campaigns. $\varepsilon$ may depend on how good campaigner is $A$ in attracting votes, how well he can translate financial resources to voter support and the like. It bears noting that neither $\varepsilon$ nor $P$ are equal to the share of group $A$ in the population, although it may affect them. Winning the election depends not on the number of people who may broadly associate with the party led by $A$, but on the number of those who vote for $A$; age restrictions, voter apathy or alienation, distribution of voters across constituencies, campaign issues and personal appeal are some of the factors which explain this difference. These considerations allow us to model electoral success as a function of campaign effectiveness and expenditure. Using the formula by which the loser of the election is guaranteed a $k$ percentage of rents, while the winner receives $1 - k$, the expected net payoffs of the two adversaries from contesting the election are written as

\[
U_A^W = P(1 - k)R + (1 - P)kR - X_A \\
U_B^W = (1 - P)(1 - k)R + PKR - X_B
\]  

(4.A)  

(4.B)

The case of majoritarian politics, where the winner takes all the rents from office can be derived as a special case of the above by setting $k = 0$. 

$^{11}$ Throughout the analysis it is assumed that both A and B have enough resources to finance the required sums for fighting the conflict.
Assuming that unique Nash equilibrium solutions of the civil war and election – power-sharing game exist, each faction chooses the form of contest which brings the highest expected payoff. The Nash equilibrium of the game is obtained when A maximizes (2.A) with respect to $Z_A$ subject to (1) treating $Z_B$ as given and B maximizes (2.B) with respect to $Z_B$ subject to (1) treating $Z_A$ as given. Solving we obtain the following equilibrium values of expenditures for fighting and probability that $A$ wins the civil war

$$Z_A^* = Z_B^* = \gamma (1 - \gamma)(1 - \theta)R; \quad Q^* = \gamma$$  

That is, in the context of the present setting both factions choose to spend identical sums on the effort to fight the war effort, and this sum rises with the size of office rents. On the other hand, the probability of victory of $A$ and $B$ differs and is simply equal to their respective fighting effectiveness. Substituting into (2.A) and (2.B) we obtain the corresponding equilibrium net expected payoffs as

$$V_A^W = \gamma^2(1 - \theta)R \quad (5.A)$$

$$V_B^W = (1 - \gamma)^2(1 - \theta)R \quad (5.B)$$

Working in a similar manner for the election contest we find

$$X_A^* = X_B^* = \varepsilon (1 - \varepsilon)R; \quad P^* = \varepsilon$$  

That is, again both factions choose to spend identical sums on the effort to fight the war effort, and this sum rises with the size of office rents. On the other hand, the probability of victory of $A$ and $B$ differs and is simply equal to their respective election campaign effectiveness. Substituting into (2.A) and (2.B) we obtain corresponding equilibrium net expected payoffs as

$$V_A^G = \left[ \varepsilon^2 + k^2(1 - 2\varepsilon^2) \right]R \quad (6.A)$$

$$V_B^G = \left\{ (1 - \varepsilon)^2 + k[2\varepsilon(2\varepsilon - 1)] \right\}R \quad (6.B)$$

As before, the two groups incur equal levels of campaign expenses but are characterised by different probabilities of success, which are equal to their respective campaign effectiveness. Comparison of (3) and (6) shows that in the set up of the current model, we

---

12 A Nash equilibrium of the civil war sub-game $(Z_A^*, Z_B^*)$ requires that for all $Z_A$, $U_A(Z_A^*, Z_B^*) \geq U_A(Z_A, X_B^*)$ and for all $Z_B$, $U_B(Z_A^*, Z_B^*) \geq U_B(X_A^*, Z_B)$, and analogously for the election game.
cannot say a priori whether fighting a violent conflict is necessarily more expensive than fighting an election, for this depends on the relative effectiveness parameters $\gamma$ and $\varepsilon$ and the destructive effect of the conflict $\theta$, which tends to decrease the size of resources committed to winning the conflict.

A peaceful political arrangement will prevail if both rivals are better off under that arrangement, while conflict arises if at least one of the two adversaries expects a higher payoff by engaging in a violent fight, that is, when $\Delta_A^{GW} \equiv V_A^G - V_A^W > 0$ and simultaneously $\Delta_B^{GW} \equiv V_B^G - V_B^W > 0$. After the relevant manipulations we find

$$
\Delta_A^{GW} = \left[ \varepsilon^2 + k(1 - 2\varepsilon^2) - \gamma^2(1 - \theta) \right] R \tag{7.A}
$$

$$
\Delta_B^{GW} = \left[ (1 - \varepsilon)^2 + k[2\varepsilon(2\varepsilon - 1)] - (1 - \gamma)^2(1 - \theta) \right] R \tag{7.B}
$$

With the coefficients $\varepsilon$, $\gamma$ and $\theta$ exogenously given, the size of the power-sharing parameter $k$ emerges as a crucial variable to induce both rivals to accept a peace settlement. Following Garfinkel and Skaperdas (2007), it is now assumed that the rival groups agree to divide the gains that are realised when a settlement is agreed and war is avoided according to the “split-the-surplus” formula, whereby $\Delta_A^{GW} = \Delta_B^{GW}$. 13 That is, by a division rule which postulates that each side obtains the same gain by avoiding war.

Substituting from the sets of equations (7), and solving with respect to $k$, we obtain the equilibrium size of $k$

$$
k^* = \frac{1}{2} \left[ 1 + (1 - \theta) \frac{2\gamma - 1}{2\varepsilon - 1} \right] \tag{8}
$$

The latter is defined for values such that $\varepsilon \neq \frac{1}{2}$. Equation (8) shows that the power sharing parameter depends on the fighting and electoral campaigning effectiveness of the rival groups and the destructive effect of war. More specifically, two components are identified:

13 “Under risk neutrality, this rule coincides with the prescription of any symmetric bargaining solution, including the Nash bargaining solution, and is implementable non-cooperatively by a number of alternating-offers games...” Garfinkel and Skaperdas (2007), p.24.
(1) The quantity $\frac{1}{2}$ which may be called the “equality component”, that is, other things being equal the two sides split the rents equally.

(2) The expression $\frac{1}{2}(1-\theta)(2\gamma-1)/(2\varepsilon-1)$. The quantity $(1-\theta)$ indicates the marginal income surviving the civil war. Noting first that $2\gamma-1 = \gamma-(1-\gamma)$ is the difference in the war fighting effectiveness of $A$ and $B$, and similarly, $2\varepsilon-1 = \varepsilon-(1-\varepsilon)$ is the difference in the election campaign effectiveness of $A$ and $B$, the ratio of the two differences $(2\gamma-1)/(2\varepsilon-1)$ is the relative effectiveness of $A$ fighting a civil war rather than an election to win office. Obviously, this ratio can be greater, equal or smaller than zero. Hence, the expression $\frac{1}{2}(1-\theta)(2\gamma-1)/(2\varepsilon-1)$ can be thought as half the value of income which survives the civil war weighted by A’s war – election relative effectiveness. It reflects how the destructive effect of war, in conjunction with the balance of war and electoral victory may affect power sharing.

Regarding the equilibrium size of $k^*$, we note that after the relevant manipulations we find that for $k^* \leq \frac{1}{2}$ it must be either $\gamma > \frac{1}{2}$ and $\varepsilon > \frac{1}{2}$, or $\gamma < \frac{1}{2}$ and $\varepsilon < \frac{1}{2}$. That is, awarding the election winner a larger share of power than the election loser requires that one of the two opponents is more effective in both fighting the war and campaigning in elections. Intuitively, power-sharing of the type outlined is possible in a situation where one of the two groups, is more likely to prevail in both the civil and the election contest. Using the above we find that when $\gamma > \frac{1}{2}$ and $\varepsilon > \frac{1}{2}$, it will be $k^* > 0$ if $\theta < 2(\gamma-\varepsilon)/(2\gamma-1)$, while when $\gamma < \frac{1}{2}$ and $\varepsilon < \frac{1}{2}$, it will be $k^* > 0$ if $\theta > 2(\varepsilon-\gamma)/(1-2\gamma)$. When $\varepsilon = \frac{1}{2}$ we have from (7.A) and (7.B) that $\Delta^G_W = \left[\frac{1}{4}+(k/2)\gamma(1-\theta)\right]R$ and $\Delta^G_B = \left[\frac{1}{4}+(k/2)-(1-\gamma)^2(1-\theta)\right]R$, which imply that $k$ is now indeterminate; $\Delta^G_W = \Delta^G_B$ can only be satisfied if only $\gamma = \frac{1}{2} = \varepsilon$, that is, the two adversaries are equally matched in both the war and the election front and the respective payoffs are equal. If this is the case we make the presumption that the peace settlement is preferred.

Substituting $k^*$ from (8) into (7.A), or (7.B) we find the corresponding value of $\Delta$ as
However, the sign of the latter cannot be determined unambiguously at this level of generality. The latter also implies that an increase in the size of rents has an ambiguous effect on the division of such rents between the two contestants. Instead we proceed with an examination of the comparative static properties of $k^*$, shown in Table 1.

The first row shows that when $A$ is more likely to win the election and his fighting effectiveness rises, more power is allocated to the election winner (that is $A$); while if $A$ is less likely to win the election but his fighting effectiveness rises, less of power is allocated to the election winner (likely to be $B$) in order to give $A$ the incentive to participate in the power sharing arrangement, a result which accords well with intuition.

<table>
<thead>
<tr>
<th>Derivative</th>
<th>Sign when $\varepsilon &gt; \frac{1}{2}$ ($A$= likelier election winner)</th>
<th>Sign when $\varepsilon &lt; \frac{1}{2}$ ($B$= likelier election winner)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{dk^*}{d\gamma} = \frac{1-\theta}{2(2\gamma - 1)^s}$</td>
<td>$-$</td>
<td>$+$</td>
</tr>
<tr>
<td>$\frac{dk^*}{d\varepsilon} = \frac{(1-\theta)(2\gamma - 1)}{(2\varepsilon - 1)^s}$</td>
<td>$+$</td>
<td>$-$</td>
</tr>
<tr>
<td>$\frac{dk^*}{d\theta} = \frac{12\gamma - 1}{2(2\varepsilon - 1)}$</td>
<td>$+$</td>
<td>$+$</td>
</tr>
</tbody>
</table>

The signs of the expression in the second row indicates that when $A$ is the likely election winner, an increase in his electoral effectiveness, which reduces the probability that $B$ may win the election even further, is followed by an increase in the rents given to the election loser, to co-opt $B$ to the power sharing arrangement. On the other hand, if $B$ is the likely election winner, an increase in the electoral effectiveness of $A$ is accompanied by more powers for the election winner, as both groups now see the election offering them a way to gain the rents of office.
The third row presents the effect of an increase in the destructive effect of war. Irrespective of whoever is more likely to win the civil war and the election, an increase in the destructiveness of war induces both parties to award more office rents to the election loser to avoid war.

Finally, equation (8) can also be used to identify when the two rivals will agree to lay down their weapons and adopt majoritarian politics. Setting $k^* = 0$ and solving we obtain

$$\frac{(1-\theta)}{2\gamma -1} = \frac{2\varepsilon -1}{2\gamma -1}.$$  \hfill (9)

That is, the two rivals will choose to establish a majoritarian democracy in the special case where $A$’s election – war relative fighting effectiveness equals the marginal income surviving the war. Since it is unlikely that this special condition is satisfied in practiced, it is clear why adoption of majoritarian democracy by the mutual agreement of the two rival groups is also unlikely.

(C) Conflict and power-sharing under risk aversion

As already shown under risk aversion the expected benefits from a majoritarian and a proportional representation rule differ, we proceed to analyse power-sharing without employing the previous formula for division of rents.

When $A$ and $B$ seek office by fighting a civil war the expected net payoffs of the two rival factions are expressed as, where by assumption, $\ln(1-\theta)R > 0$

$$U_A^C = Q\ln(1-\theta)R - Z_A$$ \hfill (10.A)
$$U_B^C = (1-Q)\ln(1-\theta)R - Z_B$$ \hfill (10.B)

Maximising subject to (1) and solving we obtain the following equilibrium values of expenditures for fighting, probability that $A$ wins, and corresponding net expected payoffs

$$Z_A^* = Z_B^* = \gamma (1-\gamma)\ln(1-\theta)R; \quad Q^* = \gamma$$  \hfill (11)

$$V_A^C = \gamma^2 \ln(1-\theta)R$$ \hfill (11.A)
$$V_B^C = (1-\gamma^2)\ln(1-\theta)R$$ \hfill (11.B)
Clearly, the properties of the equilibrium mirror those found above – see the sets of equations (5).

Under a majoritarian system the expected net payoffs are written as

\[ U_A^E = P \ln R - Y_A \]  (12.A)
\[ U_B^E = (1-P) \ln R - Y_B \]  (12.B)

Maximising subject to (3) and solving we derive

\[ Y_A^* = Y_B^* = \varepsilon (1-\varepsilon) \ln R; \quad P^* = \varepsilon \]  (13)
\[ V_A^E = \varepsilon^2 \ln R \]  (13.A)
\[ V_B^E = (1-\varepsilon)^2 \ln R \]  (13.B)

Finally, under power-sharing where elections take place using a proportional representation rule and rents are allocated according to the share of votes polled by each party in the election (and therefore the probability that each party wins the election) the expected net payoffs are

\[ U_A^S = \ln PR - X_A \]  (14.A)
\[ U_B^S = \ln (1-P) R - X_B \]  (14.B)

In the present setting, the expected utility from power-sharing is the certain benefit from a proportion of the rents from office (where the proportion equals the ratio of votes polled). We now obtain

\[ X_A^* = \frac{\sqrt{1-\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} \quad X_B^* = \frac{\sqrt{\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} \quad P^* = \frac{\sqrt{\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} \]  (15)
\[ V_A^S = \ln R + \ln \frac{\sqrt{1-\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} - \frac{\sqrt{1-\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} \]  (15.A)
\[ V_B^S = \ln R + \ln \frac{\sqrt{\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} - \frac{\sqrt{\varepsilon}}{\sqrt{\varepsilon} + \sqrt{1-\varepsilon}} \]  (15.B)

In contrast to the previous two cases, the equilibrium levels of expenditure for fighting the election differ between the two parties and, in addition, they only depend on the campaign effectiveness of A and B (that is, they are independent of the size of rent from office). Both \( V_A^S \) and \( V_B^S \) are assumed to be positive.
Comparing power-sharing to violent conflict we have

\[
\Delta_A^{SC} \equiv V_A^S - V_A^C = (1 - \gamma) \ln R + \ln \sqrt{\sqrt{s} + \sqrt{1 - s}} - \sqrt{1 - \gamma} / (\sqrt{s} + \sqrt{1 - s}) - \sqrt{2} \ln(1 - \theta)
\]  
(16.A)

\[
\Delta_B^{SC} \equiv V_B^S - V_B^C = \cdots
\]

\[
\gamma = ((2 - \gamma^s) \ln R + \ln \sqrt{(1 - s)/(\sqrt{s} + \sqrt{1 - s})} - \sqrt{1 - \gamma} / (\sqrt{s} + \sqrt{1 - s}) - \cdots)^2 \ln(1 - \theta)
\]
(16.B)

For parameter values such that both \(\Delta_A^{SC}\) and \(\Delta_B^{SC}\) are positive simultaneously both \(A\) and \(B\) choose a peaceful settlement. After the relevant manipulations and denoting

\[
-\frac{\ln \sqrt{1 - s}}{s} - \frac{\sqrt{1 - s}}{\sqrt{s} + \sqrt{1 - s}} < 0
\]

we derive the following critical values

\[
\Delta_A^{SC} > 0 \text{ when } \gamma < \gamma_A \equiv \sqrt{\frac{\ln R - B}{\ln R(1 - \theta)}} > 0
\]  
(17.A)

\[
\Delta_B^{SC} > 0 \text{ when } \gamma > \gamma_B \equiv 1 - \gamma > 0 , \text{ where } \gamma = \sqrt{\frac{\ln R - B}{\ln R(1 - \theta)}}
\]  
(17.B)

Thus, power-sharing is adopted for values of \(\gamma\) which satisfy (17.A) and (17.B) simultaneously. This requires that \(\gamma_B < \gamma_A\), which in turn requires that the following inequality is satisfied: \(3(\ln R)^2 - 2[E + \tilde{E} - \ln(1 - \theta)]\ln R - [E + \tilde{E} + \ln(1 - \theta)]^2 + 4E^2 \tilde{E} > 0\). In what follows we assume that the above is always satisfied. Contrary to the previous case, in the present setting there is no variable to solve for its equilibrium value; we can only find the range of values over which a power-sharing settlement may be adopted. \(\gamma_A\) is the upper limit of \(A\)'s war effectiveness at which \(A\) compromises and shares power; analogously, \(\gamma_B\) is the upper limit of \(A\)'s war effectiveness at which \(B\) settles for power-sharing – see Figure 1. To put it another way, if \(\gamma\) exceeds \(\gamma_A\), \(A\) expects a higher payoff from not compromising and pursuing the rewards of office through fighting, while if \(\gamma\) is below \(\gamma_B\)
$B$ expects a higher payoff from fighting. One may then conjecture then that if for some reason $\gamma_A$ rises or $\gamma_B$ falls, power-sharing becomes more likely. It is worth noting that in the present setting, since there is no reason to expect that either $\gamma_A$ or $\gamma_B$ are equal to $\frac{1}{2}$, the threshold values of $\gamma$ above (or below) which the warring factions are willing to trade bullets for voting booths is different from one-half. That is, peace and democracy may prevail even though one of the contestants may believe that he has a more than fifty per cent probability to defeat his opponent in a war. The intuitive explanation is that under power sharing he, as well as his opponent, are better off with a higher fraction of the spoils of office, even if he enters office as an election loser.

**Figure 1: Power-sharing settlement**

Power-sharing arrangements are established for $\gamma$ such that $\gamma_B \geq \gamma \geq \gamma_A$

Checking the comparative static properties of $\gamma_A$ we have

$$\frac{d\gamma_A}{dR} = \frac{1}{2\gamma_A R [\ln R (1 - \varphi)]} > = < 0 \text{ as } \frac{\sqrt{1 - \varphi}}{\sqrt{1 - \xi} + \sqrt{1 - \xi}} - \frac{\ln \sqrt{\varphi}}{\sqrt{\varphi} + \sqrt{1 - \xi}} = \frac{\ln (1 - \varphi)}{\sqrt{1 - \xi} + \sqrt{1 - \xi}} > = < 0$$

(14.A)

The effect of an increase in the rewards from office on the critical value of $A$’s fighting effectiveness below which $A$ chooses the power-sharing settlement is ambiguous as it depends on the balance of the electoral effectiveness of $A$ and the destructive effect of war.\footnote{To get a better understanding of how the signs of $d\gamma_A/dR$ and $d\gamma_B/dR$ vary with the values of $\varepsilon$ and $\theta$, Appendix 1 reports the signs of $E$, $B$ and $\ln(1-\theta)$ for $\varepsilon \in (0,1)$ and $\theta \in (0,1)$ to one decimal place. The grid yields $9 \times 9 = 81$ values for each derivative.}
An increase in the destructive effect of war increases the critical value of A’s fighting effectiveness below which A chooses the power-sharing settlement, since it increases the expected loss from civil war

\[
\frac{d\gamma_A}{d\theta} = \frac{1}{4\gamma_A \ln R(1-\theta)(\sqrt{\frac{e^T}{\theta}} + \sqrt{1-\theta})^2} > 0
\]

(14.C)

An increase in A’s electoral effectiveness increases the critical value of A’s fighting effectiveness below which A chooses the power-sharing settlement, because it increases A’s expected benefit from the electoral campaign.

Similarly, for \( \gamma_B \) we obtain

\[
\frac{d\gamma_B}{dR} = \frac{-1}{2R \ln R(1-\theta)} \frac{\ln \frac{\sqrt{e^T}}{\theta} + \ln 1-\theta}{\sqrt{\frac{e^T}{\theta}} + \sqrt{1-\theta}} < 0
\]

(15.A)

\[
\frac{d\gamma_B}{d\theta} = \frac{-1}{4\gamma_B \ln R(1-\theta)(\sqrt{\frac{e^T}{\theta}} + \sqrt{1-\theta})^2} < 0
\]

(14.B)

\[
\frac{d\gamma_B}{d\varepsilon} = \frac{2\sqrt{1-\varepsilon} + \sqrt{\varepsilon}}{4\gamma_B \ln R(1-\theta)(\sqrt{\frac{e^T}{\theta}} + \sqrt{1-\theta})^2} > 0
\]

(15.C)

The comparative statics properties of \( \gamma_B \) mirror those of \( \gamma_A \), that is, the effect of an increase of the rewards from office is ambiguous; an increase in the destructiveness of war decreases the upper value of A’s war effectiveness which bring B to accept power-sharing, while an increase in the electoral effectiveness of A does the opposite, since it reduces the chances that B wins office rents through elections. In sum, when the destructive effect of war, \( \theta \), increases it becomes more likely for the adversaries agree a peace settlement, but the effect of an increase in \( R \) and \( \varepsilon \) are ambiguous.

(2) **Majoritarian democracy V power-sharing**
Working in a similar manner we obtain that the difference in A’s and B’s expected net payoffs from power-sharing and standard majoritarian election outcomes are respectively

$$
(16.\text{A})
$$

$$
(16.\text{B})
$$

Defining as above

$$
\begin{align*}
-\frac{\ln \epsilon / \sqrt{\epsilon + \sqrt{1 - \epsilon}} - \sqrt{1 - \epsilon}}{\sqrt{\epsilon + \sqrt{1 - \epsilon}}} < 0,
\end{align*}
$$

$$
\equiv \frac{\sqrt{1 - \epsilon} - \sqrt{\epsilon}}{\sqrt{\epsilon + \sqrt{1 - \epsilon}}} < 0,
$$

$$
\equiv \sqrt{1 - \epsilon} - \sqrt{\epsilon} < 0,
$$

$A$ chooses power-sharing instead of majority rule politics when

$$
lnR > \frac{\beta}{1 - \epsilon^2} = r_A
$$

(17.A)

On the other hand, $B$ chooses power-sharing instead of majority rule politics when

$$
lnR > \frac{\beta}{\sqrt{1 - \epsilon^2}} = r_B
$$

(17.B)

That is, the reward from office must be sufficiently large to induce the rival parties to share it. The signs of the derivatives of $r_A$ and $r_B$ with respect to $\epsilon$ are not straightforward at this level of generality, but the difference $r_A - r_B$ can be easily evaluated for $0 \leq \epsilon \leq 1$, see Appendix 2. Specifically, $r_A < r_B$ for $0 < \epsilon < \frac{1}{2}$, $r_A = r_B$ for $\epsilon = \frac{1}{2}$ and $r_A > r_B$ for $\frac{1}{2} < \epsilon < 1$. The general conclusion here is that for values such that $lnR > \max \{r_A, r_B\}$ both $A$ and $B$ choose power-sharing, while for all other values of $R$, at least one of $A$ and $B$ prefers majoritarian politics and will not consent to power-sharing arrangements. This shows that even when there is no risk of civil war there is a range of values which makes power-sharing more desirable for both parties. The intuition is that when the reward from office is high enough, parties are better off by sharing the spoils unequally, rather than fighting a winner-takes-all election. A corollary of this result is that in a divided society where one group has an inbuilt majority, referendums on constitutional or any other policy issues decided by a simple majority rule will not necessarily produce durable settlements (see Bogdanor 1994).
Finally comparing the payoffs from majoritarian elections and violent conflict we have

\[ \Delta_{A}^{EC} \equiv V_{A}^{E} - V_{A}^{C} = (\epsilon - \gamma)(\epsilon + \gamma)\ln R - \gamma^2 \ln(1 - \theta) \] (18.A)

\[ \Delta_{B}^{EC} \equiv V_{B}^{E} - V_{B}^{C} = (\epsilon - \gamma)(\epsilon + \gamma - 2)\ln R - \gamma^2 \ln(1 - \theta) \] (18.B)

\[ A \] chooses majority rule politics instead of conflict \((\Delta_{A}^{EC} > 0)\) when

\[ \gamma < \frac{\ln R}{\ln R(1 - \theta)} \cdot c_{A} \] (19.A)

We may note that since from (19.A) \(c_{A} > \epsilon\) a sufficient condition for \(A\) to disarm and accept democracy is that \(\gamma < \epsilon\). In turn, \(B\) chooses majority rule politics when

\[ \gamma > \left( 1 - \frac{\epsilon}{\epsilon - \gamma} \right) \cdot \frac{\ln R}{\ln R(1 - \theta)} \cdot c_{B} \] (19.B)

A sufficient condition for the latter is \(l - \epsilon > l - \gamma\), which is the opposite of the previous one. The latter implies that when \(\epsilon = \gamma\), both \(A\) and \(B\) choose peaceful majority rule politics, that is, each of the two rival is equally effective in fighting both a war and an election. More generally, majoritarian democracy is adopted for values of \(\gamma\) such that \(c_{A} > \gamma > c_{B}\). It can easily be checked that the \([c_{A}, c_{B}]\) interval is non-empty since \(c_{A} - c_{B} = \sqrt{\frac{\ln R}{\ln R(1 - \theta)}} - 1 > 0\). If in practice \(c_{A} > \gamma > c_{B}\) is a rare event, proposition III gives a formal account why the different groups of a divided society are engaging in conflict and reject majoritarian politics.

5 Conclusions

Following a long line of work, the purpose of the present paper has been to analyse when two office-motivated political rivals agree to give up violent conflict and share power on the basis of their electoral support. In studying the benefits of peace, the existing literature has compared the uncertain outcome of conflict over a resource to the deterministic outcome of sharing the resource according to a division formula. The
present paper extends this framework by comparing the uncertain outcome of conflict to the uncertain outcome of an election, which then determines how the resource is shared between the disputants.

Consociational government and sharing the benefits of office is often hailed as a most fruitful mechanism to manage conflict in societies riddled by deep divisions, since they require the agreement of actors with diverse interests. On the other hand, since power-sharing is a non majoritarian arrangement, it raises the question why an electoral majority shares power with a defeated minority restricting its freedom to decide policy by the wishes of it may actually consider as a hostile opponent. The paper used the insights of the economic analysis of conflict and applied conventional optimisation tools and game theoretic concepts to identify the determinants of the benefits and costs of seeking office through violent means, as in a civil war, or through peaceful resolution, as in democratic politics, and their implications for institutional design. For each rational political player the choice between winning office by bullets or by the ballot box will depend on which setting secures the highest expected net payoff.

A model of conflict was analysed where two rivals fight to obtain the benefits of office, the probability of winning the fight is endogenous and depends on the effort expended to fight and the fighting effectiveness of each adversary and conflict destroys part of the office benefits. Similarly, when the rivals compete for office through elections, the probability of winning the electoral contest depends on the effort invested in the election campaign and the campaign effectiveness of each adversary, but contrary to war the reward from office stays intact. Power-sharing according to the vote shares of each side rules out the use of majoritarian electoral systems, which concentrate power in the hands of a single political party. Two ways of power-sharing were modelled. In the first, the adversaries were assumed to be risk neutral and power sharing was formulated as dividing the benefits of office by granting a share of benefits to the election loser. The share was determined from a division which specified that that after the election each side obtained the same gain by avoiding war. We then identified the range of values of the minimum share that would yield higher ex ante payoffs to both rivals (winner and loser
of elections) than fighting and induce them to give up fighting and enter peaceful politics. In the second formulation, the two sides were assumed to be risk averse and when power-sharing is agreed they shared the benefits of office according to their vote share. Again this allowed us to identify the circumstances when both sides chose power-sharing to conflict (as well as power-sharing rather than majoritarian politics and majoritarian politics rather than war).

It emerged that the effectiveness of election campaigning relative to the effectiveness of fighting a war, the size of the benefits from office and the proportion of those benefits destroyed by fighting are of crucial importance in the choices made by the two rivals.

The present analysis informative as it may be can be extended in several important directions. In the first instance, one may relax the implicit assumption that the two sides can always raise enough funds to pay for their war and election efforts, and explore the constraints on the availability of funds. For example, suppose that either or both combatants may be unable to cover their war expenditure but rely on foreign support. In this case, accepting or rejecting power-sharing would depend on exogenous financial factors. A second extension is to broaden the analysis to a dynamic setting where fighting today permanently eliminates the rival saving on expenditure for future armaments, while elections have to be fought every period. Accounting for the discounted rewards may change the incentive to compromise and share power. Thirdly, in accordance to the comparative electoral systems literature, and contrary to standard modelling of conflicts, the utility function of each player may be expanded to include policy objectives in addition to the office rent motive. A fourth complication is to introduce intra-group divisions; that is, although it is perfectly sensible to think of two opposing ethnic communities going to war, when peaceful politics prevail, each group may be divided on other non-ethnic issues implying that its members may vote for different parties, and given proportional representation all those parties are represented in parliament, as it is the case in Northern Ireland.
Appendix 1: Violent conflict V power-sharing

The signs of the derivatives of the critical values of $\gamma_A$ and $\gamma_B$ with respect to $R$

Equation (14.A) \(\Rightarrow\) Sign of \(\frac{d\gamma_A}{dR}\) = Sign of \([E+\ln(1-\theta)]\);

Equation (15.A) \(\Rightarrow\) Sign of \(\frac{d\gamma_B}{dR}\) = Sign of \(-[\frac{E}{\theta}+\ln(1-\theta)]\);

<table>
<thead>
<tr>
<th>$\varepsilon$</th>
<th>$E$</th>
<th>$\frac{E}{\theta}$</th>
<th>$\theta$</th>
<th>$\ln(1-\theta)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>2.14</td>
<td>0.53</td>
<td>0.1</td>
<td>-0.10</td>
</tr>
<tr>
<td>0.2</td>
<td>1.76</td>
<td>0.74</td>
<td>0.3</td>
<td>-0.22</td>
</tr>
<tr>
<td>0.3</td>
<td>1.51</td>
<td>0.88</td>
<td>0.3</td>
<td>-0.35</td>
</tr>
<tr>
<td>0.4</td>
<td>1.34</td>
<td>1.04</td>
<td>0.4</td>
<td>-0.51</td>
</tr>
<tr>
<td>0.5</td>
<td>1.19</td>
<td>1.19</td>
<td>0.5</td>
<td>-0.69</td>
</tr>
<tr>
<td>0.6</td>
<td>1.04</td>
<td>1.34</td>
<td>0.6</td>
<td>-0.91</td>
</tr>
<tr>
<td>0.7</td>
<td>0.88</td>
<td>1.51</td>
<td>0.7</td>
<td>-1.20</td>
</tr>
<tr>
<td>0.8</td>
<td>0.74</td>
<td>1.76</td>
<td>0.8</td>
<td>-1.60</td>
</tr>
<tr>
<td>0.9</td>
<td>0.53</td>
<td>2.14</td>
<td>0.9</td>
<td>-2.30</td>
</tr>
</tbody>
</table>

For example, with $\varepsilon = 0.6$ and $\theta = 0.4$ we have that $E+\ln\theta = 0.53$ and $\frac{d\gamma_A}{dR} < 0$, $-[\frac{E}{\theta}+\ln(1-\theta)] = 0.83$ and $\frac{d\gamma_B}{dR} < 0$, while with $\varepsilon = 0.6$ and $\theta = 0.7$ we have that $E+\ln\theta = -0.16$ and $\frac{d\gamma_A}{dR} < 0$, $-[\frac{E}{\theta}+\ln(1-\theta)] = 0.14$ and $\frac{d\gamma_B}{dR} < 0$, etc.

Appendix 2: Majoritarian democracy V power-sharing

Critical values of rents for $A$ and $B$ to accept power-sharing

<table>
<thead>
<tr>
<th>$\varepsilon$</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
<th>0.8</th>
<th>0.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r_A - r_B$</td>
<td>-0.62</td>
<td>-0.22</td>
<td>-0.07</td>
<td>-0.03</td>
<td>0</td>
<td>0.03</td>
<td>0.007</td>
<td>0.022</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Note: $r_A = \frac{B}{1-\varepsilon^2}$, $r_B = \frac{\frac{B}{\theta^2}}{2-\varepsilon} = \frac{E}{\theta}$

References


