

Do African countries suffer from their arbitrary boundaries? The authors test several hypotheses from the debate on this question. They differentiate, one by one, the degree of arbitrariness of African boundaries along two axes: the extent to which they partition preexisting political groupings (dismemberment) and the degree to which they bring together distinct precolonial political cultures (suffocation). They find that dismemberment is positively associated with international disputes and that suffocation magnifies the likelihood of civil wars, political instability, and secession attempts. The evidence appears to support claims that Africa has paid a substantial price for refusing to challenge some of the arbitrary boundaries it inherited from colonialism. The authors discuss the policy implications of their findings.

DISMEMBERMENT AND SUFFOCATION A Contribution to the Debate on African Boundaries

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There is little disagreement that the boundaries of contemporary African states are unusually arbitrary as a result of their largely colonial origins (Ajala, 1983; Asiwaju, 1985; Barbour, 1961; Bello, 1995; Brownlie, 1979; Davidson, 1992; Kum, 1993; Nugent & Asiwaju, 1996; Sautter, 1982; Touval, 1966). There is no consensus, however, as to whether this has been a liability for African states. Some argue that borders everywhere are artificial

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and that the case for African exceptionalism is weak (Clapham, 1996a; Odugbemi, 1995). Others do not dismiss the relatively erratic nature of African boundaries but suggest either that it has had few deleterious consequences (Ottaway, 1999; Touval, 1969), that the boundary lines also represent a source of opportunities for African populations (Bach, 1999; Nugent, 1996), or that they are an asset for state consolidation (Herbst, 2000). Still others agree that Africa has suffered from its partitioned nature but see the costs of reshuffling states as greater than the hypothetical benefits ("Africa's bizarre borders," 1997; Barbour, 1961; Bayart, 1996; "Consensus and stability," 1995; Griffiths, 1996; Young, 1996). Finally, a few authors believe that at least some African states would gain from territorial reconfiguration (Bello, 1995; Herbst, 1990, 2000; Nkiwane, 1993; Southall, 1985).

Recent political conditions in sub-Saharan Africa, characterized by international and domestic conflict, state failures, and the criminalization of structures of authority, have heightened the urgency of identifying whether boundaries share responsibility for the continent's predicament. Yet lively as the debate on African boundaries has been, it has suffered from several shortcomings that have prevented substantive progress on this question. First, it has received little systematic treatment, with much of the literature proving anecdotal, opinion-based, or dependent on few and possibly biased cases. Second, despite a few exceptions (Bach, 1995; Thom, 1975), it has tended to subsume African states into a single category without distinctions in degrees of territorial arbitrariness, whereas the particular conditions of each state actually vary widely. Without accounting for these variations, inferences about the consequences of arbitrariness have been vague. Finally, the debate has also been limited by its emphasis on international conflict. Given the apparent lack of interstate conflicts in Africa until the late 1990s, the argument that artificial borders "do not matter" has gained prevalence ("Africa's bizarre borders," 1997; Bayart, 1996; "Consensus and stability," 1995; Joseph & Herbst, 1997). Whatever its validity (which we investigate), this claim misses a crucial dimension of the nature and consequences of boundaries. For, if borders determine who the other is, they also define the self and confer membership in the polity. As Clifford Geertz (1973) argues, postcolonial states are not only liable to "dismember" peoples across borders, but they may also "suffocate" heterogeneous groups within. Hence, the domestic consequences of territorial arbitrariness must be studied alongside their international counterparts.

In this article, we test hypotheses derived from the debate on African boundaries and from germane arguments about the nature of African politics. We differentiate, one by one, the degree of arbitrariness of African boundaries in terms of suffocation and dismemberment and look at possible inter-

national and domestic consequences.¹ Despite measurement difficulties, our findings are surprisingly strong and contrast with the hesitations of the literature: Arbitrary boundaries do magnify the likelihood of international and domestic conflicts and weaken the stability of governments. We conclude with a discussion of some policy issues raised by these findings.

THE ARTIFICE AND ARBITRARINESS OF AFRICAN BOUNDARIES

THE CONCEPT OF BORDER

Although the idea of “natural” boundaries is often the product of organic ideologies of the state, and most international boundaries are at least somewhat artificial and accidental, contemporary African borders appear particularly artificial both with respect to most African political cultures and in comparison with borders elsewhere.² Precolonial African societies were characterized by low population density and technology levels. As a result, their political systems were neither in need nor capable of projecting their power over large territories. Political authority and property rights extended over people more than land and, with a few exceptions such as Ethiopia (Clapham, 1996b), the concept of territorial delimitation of political control was by and large culturally alien (Allott, 1974; Herbst, 2000; Holsti, 2000). Boundary zones were fluid as jurisdiction faded from the center toward the periphery (when jurisdiction existed, which was not the case for many stateless societies). In addition, Islam, the largest unified religion in Africa, did not recognize sovereignty over specific territories (Biad, 1993; Joffe, 1990).

Hence the concept of territorially defined statehood is a European import (Allott, 1969) and contrasts with the relative survival of local traditions of political authority and social interaction. The Chewa and Ngoni of Zambia, Mozambique, and Malawi, for example, have retained stronger ties among themselves than they have developed with their respective states, and traditional Chewa migratory patterns have endured despite the borders (Phiri, 1985). The Kakwa of Uganda and Sudan have also retained their identity and precolonial loyalties (Adefuye, 1985), as have the Mandara of Cameroon and

1. There is substantial anecdotal evidence that boundaries also affect the likelihood of smuggling when kin groups find themselves straddled on both sides of international borders (Asiwaju, 1984; Barkindo, 1985; Collins, 1976; Griffiths, 1996; Ngwa, 1993; Phiri, 1985; Renner, 1985; Southall, 1985). In this article, however, we focus exclusively on the violent political effects of boundaries.

2. See Asiwaju (1984, 1993), Clapham (1996a), and Odugbemi (1995) for differing views.

Nigeria who maintain a unified parallel political authority despite living under different monetary, educational, and administrative systems (Barkindo, 1985). In short, partitioned groups frequently function as before, and the artificiality of boundaries is magnified by their frequently unmarked and permeable nature (Asiwaju, 1985; Griffiths, 1996; Touval, 1985).

VARYING DEGREES OF ARBITRARINESS

Significant variance exists across the continent, however, in the degree of arbitrariness of boundary delimitations with respect to local political and demographic configurations. In many cases, colonial borders were created without knowledge of, or interest in, local territories and populations (Asiwaju, 1984; Bentsi-Enchill, 1976; Davidson, 1992; Jackson & Rosberg, 1985). Treaties among imperial powers and with local chiefs, as well as administrative decisions within single colonial empires, often resulted in straight lines or the use of rivers or other geographical features previously as likely to unite as to separate local populations. Astronomically based straight lines were a particularly popular mode of delimitation, for their expediency suited colonizers whose knowledge of the boundary zones was limited by the decision of the 1884-1885 Berlin Conference that occupation was not required for claims of colonial sovereignty (Prescott, 1972). In the end, up to 44% of African boundaries contained straight lines (Barbour, 1961).³ In addition, 15 African states are landlocked, more than any other region. Asiwaju (1985) has also found that no less than 177 African cultural or ethnic groups are partitioned across borders, representing on average 43% of their country's population (Englebert, 2000).

In some cases, however, more extensive exploration and consultation, together with the advent of aerial photography, allowed colonizers to create more sensitive boundaries (Brownlie, 1979; Prescott, 1987). At times, they took the unity of cultural groups into account, as with the partition of Ruanda-Urundi from German East Africa (Griffiths, 1986) or the redrawing of the Niger-Nigeria boundary at the turn of the century to broadly coincide with the upper north limit of Usman dan Fodio's jihad conquest (Thom, 1975). In other cases, borders were determined after making treaties with local chiefs (Prescott, 1987) or were adjusted *ex post facto* to take account of partitioned groups and migration (Barbour, 1961; Nugent, 1996), as happened between Sudan and Uganda (Prescott, 1972).⁴ More politically centralized

3. See Ajala (1983) for more conservative estimates. Boggs (1940) argues that straight lines make sense in the Sahara where few geographical landmarks or permanent settlements exist.

4. The participation of local chiefs in boundary making is controversial, however, and many scholars view such treaties as dubious (Ajala, 1983; Alexandrowicz, 1974; Allott, 1974).

precolonial cultures may also have been more successful at resisting or negotiating partition than their stateless counterparts (Nugent, 1996). There is thus variation within Africa in the extent to which colonial boundaries may appear arbitrary to local populations. At any rate, the decision by African governments (Morocco and Somalia excepted) to endorse colonial boundaries guaranteed that the consequences of colonial expediency would endure throughout independence and self-rule.⁵ What these consequences actually have been, if any, is what the rest of this article addresses.

DEBATING THE CONSEQUENCES OF TERRITORIAL ARBITRARINESS

INTERNATIONAL CONFLICTS

The question of whether colonial boundaries are a factor of conflict among African countries is controversial. A common perception is that countries are likely to engage in disputes when they share arbitrary boundaries (United Nations, 1993), in part because such boundaries partition previously unified populations, leading to irredentist demands, creating opportunities to foment instability abroad, or otherwise increasing the likelihood of political tensions with neighbors (Asiwaju, 1993; Holsti, 1996; Kum, 1993). Those who claim international irredentist consequences assume that governments represent the interests of their partitioned citizens and will deploy efforts for their reunification, presumably within their own borders. Some circumstances may magnify the chance of irredentist claims, such as the level of precolonial statehood of the partitioned group, the prevalence of ethnic nationalism in the claimant country (Touval, 1969), or the degree of enforcement of the border by either government (Kapil, 1966). Somalia's claims over Ethiopian and Kenyan territory inhabited by ethnic Somalis—the cause of repeated conflicts with both countries, including long-lasting hostilities in Ethiopia's Ogaden region—represents probably the best-known case of African irredentism (Boyd, 1979) though by no means the only one. International disputes with irredentist elements have also involved Morocco, Algeria, Western Sahara, Libya, Chad, Ghana, Togo, and Côte d'Ivoire.

Conflicts may also derive from the ill-defined nature of many borders. Poor delimitation and demarcation, whether because the same colonial power was in charge of both sides of the border or because of imprecise colonial treaties, are common occurrences across the continent. The former can

5. Charter of the Organization of African Unity (OAU), Article 3, and OAU 1964 Cairo Resolution.

lead to classical territorial disputes, and in the latter case attempts at demarcation often cause tensions. Discrepancies between delimitation and demarcation may also promote conflict (Ajala, 1983; Allott, 1974). Multiple and contradicting treaties have, for example, contributed to disputes between Benin and Niger (over the island of Lete), between Ethiopia and Somalia, and between Nigeria and Cameroon (Mariam, 1964; Ngwa, 1993). Other delimitation conflicts have involved Burkina and Mali, Chad and Nigeria, Côte d'Ivoire and Ghana, Zaire and Zambia, and Zambia and Botswana. Sudan and Kenya also disagree over the "Ilemi Triangle" portion of their joint boundary (Brownlie, 1979). As for the ambiguous demarcation between Senegal and Gambia, it was only partly resolved when Senegal returned 26 villages from the Kantora region to Gambia in the 1960s in one of only two African precedents of postcolonial boundary redrawing (Renner, 1985).⁶

The belief that the boundary area contains natural resources can magnify disputes (Kum, 1993; Zartman, 1969). This was the case with the armed clashes between Burkina and Mali in 1974 and 1985 over the Agacher strip, which was rumored to hold oil reserves. The phosphate deposits in Western Sahara have also influenced Moroccan claims over the region, as have oil fields in the dispute about offshore islands between Cameroon and Nigeria. In general, unequal resources—including water, oil and other minerals, fisheries, and access to the sea—seem to promote conflict (Asiwaju, 1993; Prescott, 1972).

Artificial borders may also provide an opportunity for disputes by becoming pretexts to pick quarrels (Allott, 1969; Lyons, 1998; Zartman, 1969). Although the 1985 "Christmas war" between Burkina and Mali was based on territorial claims, these appeared secondary to the animosity between Thomas Sankara's revolutionary regime and Moussa Traoré's conservative government, for example. The dispute between Ghana and Togo in 1965 and 1966 was also partly driven by Nkrumah's domestic economic problems.

In contrast, several authors contend that boundary arbitrariness does not necessarily lead to litigious or belligerent outcomes (Boyd, 1979). They argue that only those groups with strong political identities or nomadic lifestyles are likely to resist partition and that irredentism is usually no more than a diversion from political and economic problems (Kum, 1993; Nugent, 1996; Touval, 1969). Southall (1985) points, for example, to the peaceful partition of the politically decentralized Alur between Zaire and Uganda. Even the demands of unified groups, such as the Masai astride Kenya and Tanzania whose chiefs petitioned the British Colonial Office for reunification before independence, have been tamed by the process of nation-building (Brownlie,

6. The other case involved shifting a line of the Mali-Mauritania border.

1979; Prescott, 1966). The relationship of split groups to structures of power in each country also matters. The political marginalization of the Bakongo in Zaire, Congo, and Angola probably contributed to subduing their original irredentist claims.⁷ More important, there is a consensus that weak African governments are unlikely to challenge each other on irredentist issues for fear of triggering a chain reaction of territorial realignments from which none of them can expect to escape unscathed (Clapham, 1996a; Herbst, 1989; Jackson & Rosberg, 1982; Touval, 1969, 1985). Given the large numbers of partitioned African groups, the rarity of actual occurrences of reunification attempts is seen as evidence for this view (Boyd, 1979; Touval, 1985).

For similar reasons, the lack of demarcation or delimitation does not have to be a cause for conflict. In fact, the permeability of many of Africa's weakest states' borders may render their arbitrariness largely irrelevant in practice (Asiwaju, 1985; Griffiths, 1996). From this point of view, the absence of empirical effectiveness of the African state (Jackson & Rosberg, 1982) somehow guarantees that its territorial arbitrariness does not result in conflict. There should therefore be little relationship between poor demarcation or delimitation and conflict.

From this discussion, we derive the following hypotheses:

Hypothesis 1. The greater the degree of dismemberment and the more politically centralized the partitioned groups, the greater the likelihood of disputes;

Hypothesis 2. The less specific the delimitation or demarcation of boundaries, the greater the likelihood of disputes;

Hypothesis 3. The greater the use of straight lines, the greater the likelihood of disputes.

CIVIL WARS, SECESSIONS, AND DOMESTIC INSTABILITY

Civil wars, secession attempts, and other forms of domestic political violence are the second most commonly discussed alleged effects of arbitrary borders. Postcolonial boundaries are believed to lead to domestic conflicts by their suffocating nature, that is, their propensity for bringing together peoples that historically lived under different, if not inimical, systems. Civil wars, secessions and coups then become issues of self-determination and challenges to the legitimacy of the state (Amadife, 1993; Holsti, 1996; Kapil, 1966; Meadwell, 1999). Although the maintenance of the colonial boundary status quo may have spared the continent from some international conflicts, African states have then possibly paid for it in terms of "weakened . . . internal

7. The Frente Nacional para a Liberacao de Angola (FNLA) was originally set up as a Bakongo irredentist movement.

dimensions of sovereignty" (Lyons, 1998) and increased political instability (Bello, 1995; Tagil, 1969). Civil wars may also be affected by dismemberment, as partitioned people such as the Somali of Ethiopia's Ogaden region fight for secession.

African civil wars have included both of the Congos, Nigeria, Ethiopia, Somalia, Sudan, Angola, Mozambique, Liberia, Sierra Leone, Uganda, Rwanda, and Burundi, although not all of them can be related to matters of suffocation. Among the continent's secession attempts, one counts the Katanga, Kwilu, Kivu, and Haut-Congo provinces of Congo; Ogaden and Eritrea in Ethiopia; Biafra in Nigeria; the Ewe of Ghana; the Sanwi of Côte d'Ivoire; coastal peoples and Somalis in Kenya; the Tuaregs of Mali; the non-Arab populations of Sudan; the Baganda of Uganda; the Casamance region of Senegal; and Somaliland. Only one of these, Eritrea, has ever been successful, with Somaliland a more ambiguous case for its lack of international recognition, but several remain dormant or are still ongoing, such as the Movement for the Actualization of the Sovereign State of Biafra (Massob). Coups have been near universal in Africa, with only a handful of countries never having experienced any. Coups need not be driven by issues of suffocation, but those that have been include attempts by northern Muslims to overthrow Chadian President Tombalbaye in the 1960s, Milton Obote's violent removal of Uganda's president and Buganda's King Muteesa in 1967, and the anti-Fang coup in Equatorial Guinea in 1969.

Yet there are robust arguments and apparent evidence that suffocation and dismemberment do not necessarily lead to secessions, civil wars, and violent overthrows. Given the number of partitioned peoples, the list of secessionist groups is remarkably short ("Africa's bizarre borders," 1997). Civil wars are not always related to boundary issues but may follow in the wake of state collapse (Ottaway, 1999). Most precolonial African states were multiethnic (Fortes & Evans-Pritchard, 1940), and combining groups may contribute to more viable states by giving all groups minority status (Barbour, 1961; Touval, 1985). Recent evidence suggests that multiethnic societies are not any more prone to civil wars and instability than their more homogeneous counterparts (Bates, 1999; Collier, 1998a; Lian & O'Neal, 1997) and that the polarization of a few groups is more deleterious to social peace than widespread heterogeneity (Collier, 1998b).

From this discussion, we derive the following hypotheses:

Hypothesis 4. The greater the degree of suffocation, the more likely the occurrence of civil wars and political instability;

Hypothesis 5. The greater the degree of dismemberment, the more likely the occurrence of secession attempts.

EMPIRICAL EVIDENCE

DATA AND METHOD

We use two data sets. In the first one, each of Africa's 104 bilateral boundaries represents an observation and in the second, each of sub-Saharan Africa's 48 countries. The choice of the data set is a function of the hypothesis being tested. We created variables to capture the dismemberment, suffocation, and otherwise arbitrary dimensions of African borders. We discuss them when they are first introduced. We also constructed measurements for several of our dependent variables, which we also discuss in their respective sections. Because of the time-invariance of suffocation and dismemberment, we are limited to cross-sectional statistical techniques. When not time-invariant, other variables are measured over the period of 1960 to 1999 unless otherwise indicated (for additional details and sources, see the appendix at www.politics.pomona.edu/penglebert).

FINDINGS

Hypotheses 1, 2, and 3: International Disputes

Many authors mention Africa's relatively few interstate conflicts in support of their claims that arbitrary borders do not matter. Our evidence suggests otherwise on two accounts. First, the perception that Africa has had few boundary disputes is by and large mistaken. Indeed, of all the territorial dispute cases brought before the International Court of Justice since 1960, 57% were African, whereas only 33% (104 out of 315) of all bilateral boundaries worldwide are in Africa (see Table 1). Furthermore, many disputes never reach stages of peaceful international settlement. Since 1960, we have identified 34 cases of disputes among African countries over border issues. Although these represent only about 29% of Africa's 104 borders, they have involved no less than two thirds of all its countries.

Second, our data indicate that within Africa there is a significant relationship between the arbitrariness of borders and the likelihood of conflict. African governments may see their interest in avoiding territorial disputes, but they find it increasingly difficult to do so the greater the proportion of their populations are partitioned by borders. Table 2 provides a first glimpse at the strength of this relationship. Using a dummy variable for the occurrence of any boundary dispute and a continuous variable for the average proportion of

Table 1
Cases Before the International Court of Justice Involving Territorial Issues

Year	Case	Countries
1999	Maritime delimitation	Nicaragua-Honduras
1998	Sovereignty over Pulau	Indonesia-Malaysia
1998	Interpretation of previous judgment	Cameroon-Nigeria
1996	Kasikili/Sedudu islands	Botswana-Namibia
1994	Land and maritime boundary	Cameroon-Nigeria
1991	Maritime delimitation and territorial questions	Qatar-Bahrein
1991	Maritime delimitation	Guinea-Bissau-Senegal
1990	Territorial dispute	Libya-Chad
1989	Arbitral award	Guinea-Bissau-Senegal
1988	Maritime delimitation	Denmark-Norway
1986	Land, island, and maritime frontier dispute	El Salvador-Honduras
1983	Frontier dispute	Burkina Faso-Mali
1981	Delimitation of maritime boundary	Canada-United States
1974	Western Sahara	Morocco

Source: International Court of Justice.

Note: All cases are contentious, except for Western Sahara (advisory).

people on both sides of a boundary belonging to partitioned ethnic groups,⁸ it assigns boundaries to one of four categories along this latter variable (0% to 25%, etc.). For each category, it reports the number of disputed and nondisputed boundaries, revealing a strong relationship between dismemberment and dispute, with the ratio of “no dispute” to “disputes” falling from 3.3 in the first column to 1.6, 0.5, and 0.14, respectively, in the next three columns and generating a highly significant chi-square value of 16.9.

To rule out the influence of other factors, we also perform several multivariate regressions (see Table 3). We rank boundaries as follows: 0 = no dispute; 1 = if the boundary line is disputed but the dispute is not pursued; 2 = if at least one state or ethnic group claims a portion of territory; 3 = if at least one state or ethnic group claims territory, and either fighting or transfer of territory has occurred; and 4 = if there has been a territorial war and/or a case before the International Court of Justice. We use ordered logit estimations, which allow for ranked ordinal-dependent variables. We find a systematically significant and positive effect of dismemberment on the likelihood and intensity of boundary disputes. This relationship is robust to all our controls,

8. We only measure the effects of colonial boundaries on preexisting indigenous populations as identified by ethnographic accounts (see data appendix at www.politics.pomona.edu/penglebert). We do not therefore include refugee populations among our estimates of partitioned peoples. Methodologically, the cross-sectional nature of our work precludes it. Substantively, the usual lack of direct participation by refugees in the host country's politics supports our choice.

Table 2
Dismemberment and Disputes

Percentage of Population Astride	0%-25%	25%-50%	50%-75%	75%-100%	Total
No dispute	53	13	2	1	70
Disputes	16	8	4	7	34
Total	69	21	6	8	104
Pearson chi-square ($df = 3$) = 16.9 ($p = .001$)					

Note: See appendix (<http://www.politics.pomona.edu/penglebert>) for measurement details and sources.

which include the length of the boundary (positive and significant); whether both sides were conquered by the same colonizer, which may reduce the potential for disputes by creating cultural affinities and mediation opportunities (insignificant); and whether at least one side was colonized by France, whose system of direct administration was possibly less respectful of local cultures (insignificant).

We also add two variables from the broader literature on the causes of international conflict. The first one controls for the hypothesis that countries are more likely to engage in conflict if they estimate their capabilities to be substantially larger than that of their expected enemy (Bremer, 1980; Singer, 1980; Singer & Small, 1972). For each boundary, we enter the difference in capabilities between the countries on each side, using Arbetman and Kugler's (1997) measure of extractive capacity. Although this control is significantly positive, the dismemberment effects remain, but the sample size is considerably reduced. The last variable relates to the hypothesis that democratic countries are less likely to engage in conflict (Brown, 1994; Reiter & Stam, 1998). Because we deal with boundaries rather than countries, we enter the average civil liberties score (Gastil index) of the countries on each side of a boundary to capture its overall democratic environment. We find, in contrast to the democratic peace hypothesis, that the more democratic the countries on each side of a boundary, the more likely the boundary is to be the subject of dispute. Apart from the awkwardness of our measurement, it could be that African democratic governments, being more vulnerable to dissent than their authoritarian counterparts, find greater domestic political returns in terms of mobilization and support from activating territorial disputes with their neighbors. At any rate, and despite the considerable loss of observations, the dismemberment effects are not affected. We conclude that there is broad and robust evidence in support of Hypothesis 1.

There is no evidence, however, that partitioned, state-like groups are more likely to cause conflicts than their less centralized counterparts. Using a sim-

Table 3
Boundary Arbitrariness and Disputes

Model	1	2	3	4	5
Measures of boundary arbitrariness					
Dismemberment	0.03*** (3.588)	0.03*** (3.486)	0.04*** (2.628)	0.03*** (3.281)	0.04*** (3.588)
Political culture of populations astride	-0.29 (1.097)	-0.42 (1.456)	-0.55 (1.332)	-0.45 (1.510)	-0.55 (1.456)
Quality of demarcation				0.06 (0.306)	-0.05 (0.306)
Straight line				0.93** (2.085)	-0.02 (0.306)
Control variables					
Boundary length		9e-4*** (2.625)	1e-3** (2.488)	1e-3** (2.691)	1e-3** (2.691)
Same colonizer		-0.28 (0.622)	0.10 (0.179)	-0.15 (0.300)	0.05 (0.300)
French on one side		0.35 (0.828)	0.29 (0.525)	0.53 (1.161)	0.26 (0.525)
Average democratic score			0.97** (2.071)		0.98** (2.071)
Capabilities differential			2.26** (1.964)		2.27** (1.964)
<i>N</i>	104	104	70	103	70
Pseudo R^2	.06	.09	.13	.11	.13
Log likelihood	-121.9	-117.9	-72.6	-113.3	-72.6
Model χ^2	14.3	22.4	22.0	27.1	22.0
Probability (χ^2)	0.00	0.00	0.00	0.00	0.00

Note: Ordered logit regressions. Numbers in parentheses are *z* values. Ancillary parameters not reported.

* $p = .10$. ** $p = .05$. *** $p = .01$.

ple arithmetic average, we coded the political culture of partitioned populations following Murdock's (1967) and Morrison, Mitchell, and Paden's (1989) typology: 1 = stateless groups, 2 = "tribal" groups, and 3 = state-like groups.⁹ This variable systematically fails to reach significance and its sign is always negative (see Table 3).

In testing Hypothesis 2, we used information about the quality of boundary demarcation from Brownlie (1979), which we coded as follows:¹⁰ 1 = no demarcation due to severe problems in delimitation, 2 = no or poor demarcation using unreliable natural features, 3 = partial demarcation using some beacons and reliable features, 4 = good demarcation but requiring some completion or repair, and 5 = complete and clear demarcation. Although the information we use dates back to 1979, Brownlie suggests that demarcation problems are typically inherited from the colonial period and vary little over time. Therefore, we take the 1979 data as a good estimate of the overall quality of demarcation for the 1960-1999 period of our dependent variable. This variable has no significant impact on disputes, however (see Table 3). Testing the relationship between our demarcation measure and disputes either before or after 1979 yields similar results, and we feel confident in rejecting this hypothesis, bearing in mind that potentially conflict-prone boundaries are also more likely to be demarcated, offsetting the effects of demarcation *per se*.

Turning to Hypothesis 3, we find marginal support for the idea that straight lines magnify the chances for disputes. A positive association between disputes and a dummy variable for the presence of straight lines evaporates on controlling for differences in state capabilities and for average democratic performance (see Table 3). This is due to lacking observations from North Africa, where many boundaries are made of straight lines. Adding a dummy variable for North Africa to the full sample (not shown) makes the straight-line dummy fall just short of significance, suggesting that it may catch the likelihood of disputes among North African countries rather than the effects of straight-line boundaries *per se*. We conclude that the influence of straight lines on disputes is marginal at best and that there may be some merit to the argument that they are an expedient solution in cases of difficult relief and sparse populations.

9. See the discussion under Hypotheses 4 and 5 for more details on the measurement of the central tendency and the spread of political cultures. Because of the lack of data on the political culture of some small partitioned groups and the absence of population weights in this measure, we caution the reader about possible measurement errors.

10. Although ordinal variables do not mathematically belong in this type of regression, their coefficients nevertheless provide a reliable estimation of whether they are related to the dependent variable.

Table 4

Probabilities of Territorial Disputes by Degree of Dismemberment: Predicted Fractions of Low- and High-Partition Boundaries in Various Dispute Categories

Probability of:	If Partitioned Pop. < 25%	If Partitioned Pop. > 25%
No dispute	0.69	0.38
Dispute not pursued	0.07	0.09
Territorial claim	0.11	0.18
Claim with fighting/transfer	0.06	0.14
War or ICJ Case	0.07	0.21

Note: Based on proportional odds model of dispute as a function of population astride, with populations astride equal to 0 if less than 25%; 1, otherwise. For methodology, see *Stata Reference Manual* (1997).

Table 4 illustrates the main finding of this section in terms of probabilities. Creating two categories of boundaries, splitting more or less than 25% of their countries' populations, we use a bivariate ordered logit regression to estimate the probabilities of different levels of disputes arising for each category. There is a 69% chance that low-partition boundaries will experience no dispute, as compared to 38% for high-partition ones. The odds get progressively reversed until they become 7% and 21%, respectively, for wars and cases before the International Court of Justice, meaning that high-partition boundaries are 3 times more likely to experience serious disputes than low-partition ones.

Hypothesis 4: Civil Wars and Political Instability

Measures of ethnic heterogeneity are the most common form of operationalization of suffocation-like concepts in studies of Africa and civil conflicts (Collier, 1998a, 1998b; Easterly & Levine, 1997; Lian & O'Neal, 1997; Posner, 2000). Yet most authors have failed to find negative effects of ethnicity on civil wars. We believe that ethnic identity is not the relevant variable to assess the domestic consequences of arbitrary borders, if only because ethnic heterogeneity can proceed from other circumstances as well. We suspect that, if suffocation exists, it relates to the aggregation within a single country of peoples with different political rather than ethnic identities. Young (1976) argues that the salience of ethnicity was partly a function of the "ideologization" of ethnic groups, by which he referred to their political development. Posner (2000) also argues that the effects of ethnicity must be related to its "political relevance." Following this reasoning, we create measures of the central tendency and spread of precolonial political cultures in

contemporary African states. We again follow Murdock's (1967) ethnographic method and assign precolonial African political systems to one of three categories, rated as follows: 1 = stateless societies, 2 = chiefdoms, and 3 = kingdoms or larger centralized states. We then measure for each country the percentage of its population that belongs to an identity group in either one of these categories and derive its weighted average political culture and a frequency-based standard deviation, capturing the "distance" between the different cultures comprised in the state or the extent of its cultural variation. We also use Herbst's (2000) insight that larger African states may suffer from poorer "national designs" than smaller ones due to the difficulties of broadcasting power over large territories with uneven population densities and low technological developments, and are more likely to comprise groups that were not historically incorporated. We include the square mileage of countries to capture this additional element of suffocation.

All our measures of suffocation are significantly associated with the prevalence of civil war between 1960 and 1999 in all but one model (see Table 5). The more state-like a country's political culture, the more likely it is to experience civil war. This relationship loses significance only when controlling for population density, probably because of Rwanda. Overall, however, it is consistent with the hypothesis that the more state-like any given group, the more it will be capable of articulating its interests in contrast to others and to the state and the more the other groups will respond with their own antagonistic identities. Similarly, the more numerous the state-like groups, the more competition for control of the state and the more likely the occurrence of civil violence.

The relationship between cultural diversity and the prevalence of civil war is more complex. The quadratic pattern identified in Table 5 suggests that intermediate levels of cultural variation reduce the likelihood of civil conflicts, whereas high levels promote it. Practically, this means that a large number of countries with middle values of cultural dispersion have never experienced civil wars. Their situation may partly capture an effect of the number of groups per country. A multiplicity of different precolonial political systems will indeed tend to generate a smaller standard deviation (and hence a lower score on our cultural heterogeneity variable) than a mere handful of them. If this is the case, our results are the mirror image of the inverted-U relationship between ethnic heterogeneity and civil war identified by Collier (1998a), with a couple of large culturally different groups more likely to lead to polarization and conflict than many smaller ones. This reading is supported by a comparison of the numbers of "cluster groups" per country, Morrison et al.'s (1989) aggregative measure of ethnic groups by cultural fea-

Table 5
Suffocation and Civil Wars

Model	1		2		3		4	
Measures of suffocation								
Average political culture	13.71**	(2.208)	14.31**	(2.261)	12.77*	(1.780)	11.38	(1.780)
Spread of political cultures	−73.82**	(−2.050)	−75.97**	(−2.132)	−64.71*	(−1.999)	−61.49*	(−1.999)
(Spread of political cultures) ²	84.17**	(2.028)	83.24**	(2.074)	69.90*	(1.888)	68.11*	(1.888)
Area	2.8E−5***	(4.078)	2.9E−5***	(4.201)	2.8E−5***	(3.745)	2.9E−5***	(3.745)
Control variables								
Portuguese colonialism	53.10***	(3.020)	54.16***	(3.080)	54.33***	(3.022)	54.40***	(3.022)
Religious polarization	—		44.81	(0.939)	49.85	(1.001)	48.19	(1.001)
Extent of state failure	—		—		0.40	(0.863)	0.34	(0.863)
Population density	—		—		—		0.04	
<i>n</i>	44		44		44		44	
Adjusted <i>R</i> ²	.54		.53		.53		.52	
<i>F</i>	10.62		10.06		8.19		7.00	
Probability > <i>F</i>	0.000		0.000		0.000		0.000	

Note: Ordinary least squares estimations with *t* statistics based on White standard errors in parentheses. The dependent variable is the number of years of civil violence, adjusted for the number of years of independence since 1960. See data appendix (www.politics.pomona.edu/penglebert) for details and sources.

p* = .10. *p* = .05. ****p* = .01.

tures.¹¹ Countries with no instances of civil war average 9.1 groups, whereas those with at least 1 year of conflict average 7.1 groups, a significant difference at the 5% level.

The size of countries yields the most robust results. Unequivocally, the larger the country, the greater the likelihood of civil wars, supporting Herbst's (2000) contention that colonization created states in Africa that are too large for effective political control. Among the other variables, only colonization by Portugal, whose belated and botched decolonization process led to civil wars in Angola and Mozambique, comes out significantly positive. Religious polarization, the extent of state failure, and population density (following the Malthusian arguments that were raised in the wake of the Rwandan genocide of 1994) are all insignificant.

In Table 6, we test the second part of Hypothesis 4, or the effects of suffocation on political instability, measured as the proportion of years between independence or 1960 (whichever comes last) and 1990 that a country has experienced coups, coup attempts, and alleged coup plots (Bates, 2000). We find a systematically positive, significant, and robust relationship between the diversity of precolonial political cultures and the extent of instability. The scope and significance of this relationship further increases on the introduction of dismemberment in the model. Dismemberment itself is also positive and significant (a relationship by and large neglected in the literature). Boundary arbitrariness may then create two distinct sources of political instability. On one hand, suffocation increases group grievances and weakens governments. On the other hand, dismemberment reduces loyalty to the system, raises unmanageable demands for structural change, and promotes government crises that prompt army interventions. The state-like nature of precolonial systems affects political stability only after controlling for dismemberment, without which the model cannot differentiate between cases like the Swazis, who inherited the postcolonial state, and the Bakongo, who were divided by it. Once dismemberment is held constant, state-like groups seem better able to articulate their grievances and challenge postcolonial governments. We derive the control variables from the quantitative literature on coups in Africa (McGowan & Johnson, 1984) and find that a Southern African location promotes stability, the threat of French interventionism has a small deterrence effect, economic volatility is insignificant, and the rate of population growth only has a marginal yet surprisingly soothing effect on the political system.

We conclude that Hypothesis 4 is broadly borne out. The relationship between cultural diversity and civil wars is not linear, however, and may

11. Only countries not scoring zero on the cultural dispersion measure are included in this comparison.

Table 6
Suffocation, Dismemberment, and Political Instability

Model	1	2	3	4	5	6	7
Measures of suffocation							
Spread of political cultures	0.280* (1.994)	0.286* (1.955)	0.292* (1.915)	0.27** (2.058)	0.254* (1.985)	0.27** (2.099)	0.413***
Average political culture		0.043 (0.641)	0.038 (0.582)	0.11* (1.693)	0.099 (1.434)	0.099 (1.371)	0.184***
Control variables							
Colonization by France			-0.025 (0.341)	-0.137* (1.759)	-0.139* (1.695)	-0.124 (1.556)	-0.201***
Southern Africa location				-0.35*** (4.486)	-0.35*** (4.570)	-0.35*** (4.349)	-0.29***
Economic instability					-0.009 (0.749)	-0.010 (0.833)	-0.015
Population growth rate						-0.090 (1.144)	-0.118*
Measure of dismemberment							
Percentage population partitioned							0.004***
<i>n</i>	42	42	42	42	41	41	40
Adjusted R^2	0.07	0.06	0.03	0.31	0.31	0.32	0
<i>F</i>	3.98	1.95	1.28	7.45	6.07	5.14	7
Probability > <i>F</i>	0.05	0.16	0.29	0.00	0.00	0.00	0

Note: Ordinary least squares estimations, with White *t* statistics in parentheses. The dependent variable is all instances of coups, coup attempts, and coup plots until 1990 (Bates, 2000) as a percentage of the years of independent rule to 1990. See data appendix (<http://www.politics.pomona.edu/pe>) for further details and sources.

* $p = .10$. ** $p = .05$. *** $p = .01$.

depend on the number of politically distinct precolonial groups contained in the state. We also find that dismemberment makes a distinct contribution to political instability.

Hypothesis 5: Secessions

Despite the conventional wisdom, secession attempts are by no means a marginal political phenomenon in Africa. Baker (2000, pp. 81-86) identifies 24 "significant" African secessionist movements from 1946 to 1998. Although most authors link secessions to dismemberment, cases like Biafra and Barotseland suggest that suffocation also plays a role. In cases of split populations, secession attempts are more likely to take an irredentist flavor, as in Ogaden or Kenya's North Eastern Province. Because of these mixed motives, we jointly model the effects of dismemberment and suffocation. We measure secessions as the number of reported cases of secessionist movements per country between 1946 and 1998 (Baker, 2000). Twenty-seven countries never experienced any secession movement, 17 have had one, 2 have had two (Angola and Chad), 1 has had four (Ethiopia), and 1 has had five (Democratic Republic of Congo [DRC]).

Our results by and large support Hypothesis 5 (see Table 7). Suffocation and dismemberment are both significantly positively associated with secessions in all but one model. The desire for secession is magnified by the variance in precolonial cultures, the length of boundaries, the size of countries, and the poverty of their "national design," Herbst's (2000) measure of the geographical and demographic features that affects governments' capacity to broadcast power. The number of different ethnocultural "cluster groups" (Morrison et al., 1989) contained in the state is the only suffocation variable that reduces the likelihood of secession attempts. It may be that, holding cultural differences constant, the more groups that a country contains, the lesser the polarization among them (and between them and the state) and the less likely any of them to secede. The positive effects of the other measures of suffocation and dismemberment are robust to the proportion of neighboring countries with the same colonizer (which may act as a deterrent by creating cultural affinities and reducing the chances of successful secession), East African location and Belgian colonization (introduced to reduce the leverage of Ethiopia and the DRC), and population growth (as changes in population density affect control over land, partly through internal migration, and may lead some groups to disengagement).

Table 7
Dismemberment, Suffocation, and Secessions

Model	1	2	3	4	5	6
Measures of suffocation and dismemberment						
Percentage of pop. partitioned	0.005** (2.600)	0.006*** (3.323)	0.003 (1.630)	0.004** (2.296)	0.005*** (3.005)	0.005** (2.600)
Spread of political cultures	0.70** (2.539)	0.95*** (3.109)	0.60** (2.255)	0.51** (2.381)	0.61** (2.551)	0.83*** (3.005)
Number of ethnocultural cluster groups		-0.04*** (2.578)	-0.05*** (3.010)	-0.05*** (3.923)	-0.05*** (3.663)	-0.06*** (3.005)
Length of land boundaries			9e-5*** (3.108)	9e-5*** (3.835)		
Area					3e-7*** (2.944)	
National design						-0.14** (2.539)
Control variables						
Proportion of neighboring countries with same colonizer				-0.005*** (2.936)	-0.004** (2.147)	-0.003* (2.539)
East Africa location				0.368*** (3.237)	0.318** (2.347)	0.334* (2.539)
Colonization by Belgium				0.167 (1.221)	0.192 (1.518)	0.270** (2.539)
Population growth				0.285*** (3.043)	0.301*** (3.068)	0.334*** (3.005)
<i>n</i>	42	42	42	42	42	39
Adjusted <i>R</i> ²	0.17	0.24	0.40	0.65	0.60	0
<i>F</i>	8.10	7.79	10.04	20.53	24.81	33
Probability > <i>F</i>	0.001	0.00	0.00	0.00	0.00	0

Note: Ordinary least squares estimations with robust White *t* statistics in parentheses. The dependent variable is the natural logarithm of 1 plus all insurrectionist movements from 1946 to 1998 (Baker, 2000). See data appendix (<http://www.politics.pomona.edu/penglebert>) for further details and sources.
 p* = .10. *p* = .05. ****p* = .01.

DISCUSSION

Our findings support claims that boundaries matter and that some African countries have paid a substantial price for failing to challenge those they inherited from colonialism. Although our measure of international conflicts is limited to boundary disputes per se—arguably a minority of Africa's conflicts—the relationship between boundary arbitrariness and political instability, civil wars and secession attempts suggests the broad relevance of suffocation and dismemberment to Africa's multiple instances of political violence.

There may then be legitimate claims for boundary changes in Africa, and such changes could be politically beneficial. Because not all African boundaries are equally arbitrary, however, and not all arbitrary ones are equally conflict-prone, reshuffling attempts should be discriminatory and based on the established existence of local demands. Opponents of change claim that delimitation is inherently difficult due to migration, nomadism, and overlapping areas containing different groups (Barbour, 1961; Griffiths, 1986; Prescott, 1972) and highlight that partitioned countries are equally prone to conflicts (Sambanis, 2000). Others stress that the fact itself of redrawing boundaries could trigger generalized violence. As the *Economist* puts it, "Stupid they may be, but trying to redraw them could plunge the continent into chaos" ("Africa's bizarre borders," 1997, p. 17). As real as this danger is, this line of reasoning is nevertheless weakened by the current spread of violence across the continent despite, and possibly because of, prevailing boundary rigidities. At the very least, our findings suggest that the social and economic costs of redrawing boundaries should be assessed in light of the costs of maintaining them.

The dilution of existing boundaries into larger regional or federal units, bringing similar groups together and weakening individual ethnic claims, has been suggested as a more realistic solution to Africa's boundary problems (Deng, 1996; Herbst, 1997; Sambanis, 2000; Southall, 1985). It has the advantage of being acceptable within the currently prevailing international regime. Unfortunately, regional integration has had few if any successes so far in Africa. The Organization of African Unity (OAU), for example, has repeatedly failed to achieve any significant level of political and economic integration among its member states over the last 40 years. To most African leaders, indeed, regional integration represents a threat to the material and symbolic resources they derive from boundaries, including revenues, rents, and the projection of their otherwise contested sovereignty. They are therefore unlikely to pay more than lip service to it. Even if they were to integrate, the accommodation of different groups within federal structures is as likely to

magnify as to solve problems of suffocation, as illustrated by the history of Nigeria, which was by and large constructed from three different colonial units.

In light of these considerations, boundary alteration may not be less realistic than boundary dilution. It may in fact represent a lesser threat to African elites because it affects the location rather than the existence of boundaries. Furthermore, whereas regional integration suffers from requiring the agency of national elites who stand to lose from its implementation, the impetus for boundary alteration lies elsewhere, in a modification of the international legal principle of intangibility of colonial boundaries. Other countries, including aid donors, can exert significant leverage in promoting such a modification, which stands to open diplomatic opportunities for groups with historically legitimate claims.

These need not be the only two options. For sure, leadership quality can mitigate the consequences of both dismemberment—as illustrated by Nelson Mandela's recognition of the authority of traditional rulers based in Botswana over the Bakgatla of South Africa (Sklar, 2001)—and suffocation—as witnessed by relatively successful accommodations of competing political cultures in Jerry Rawlings' Ghana and Yoweri Museveni's Uganda. One can also argue that economic development may eventually reduce the material importance of boundaries for elites and make irredentist and secessionist agendas less appealing to more prosperous communities. Nevertheless, ruling out territorial adjustments as a policy option for African conflict resolution underestimates the role boundaries play in these conflicts and may unnecessarily limit the realm of the possible.

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