On the theory of ethnic conflict

On the Theory of Ethnic Conflict

Francesco Caselli and Wilbur John Coleman II[1]

First Draft: December 2001; This Draft: June 2012

[1]London School of Economics, CEP, CEPR and NBER (f.caselli@lse.ac.edu); Duke University (coleman@duke.edu). We thank the editor Fabrizio Zilibotti, the referees, Alberto Alesina, Robert Barro, Paul Collier, Lisa Cook, Joan Esteban, Raquel Fernandez, Ben Friedman, Nicola Gennaioli, Seema Jayachandran, Peter Klenow, Michael Kremer, Krishna Kumar, Ben Olken, Dominic Rohner, Silvana Tenreyro, Jaume Ventura, and Romain Wacziarg for valuable comments.

Abstract

When considering engaging in conflict to secure control of a resource, a group needs to predict the amount of post-conflict leakage due to infiltration by members of losing groups. We use this insight to explain why conflict often takes place along ethnic lines, why some ethnic groups are more often in conflict than others (and some never are), and why the same groups are sometimes in conflict and sometimes at peace . In our theory ethnic markers help enforce group membership: in homogeneous societies members of the losing group can more easily pass themselves as members of the winning group, and this reduces the chances of conflict as an equilibrium outcome. We derive a number of implications of the model relating social, political, and economic indicators such as the incidence of conflict, the distance among ethnic groups, group sizes, income inequality, and expropriable resources. One of the insights is that the incidence of ethnic conflict is non-monotonic in expropriable resources as a fraction of total resources, with a low incidence for either low or high values. We use the model's predictions to interpret historical examples of conflict associated with skin pigmentation, body size, language, and religion.

1 Introduction

Each society is endowed with a set of wealth-creating assets, such as land and mineral resources, or wealth-redistributing assets, such as control of the state. There is therefore an incentive for a subset of agents to form a group to wrest control of these assets from the rest of the population, so as tho share the "pie" among fewer claimants. Once a group has won control over the country's riches, however, it faces the task of enforcing the exclusion of non-members. Agents not belonging to the winning group will attempt to infiltrate it, so as to participate in the distribution of the spoils. For example, they will apply for land titles, mining concessions, scarce places in higher education, or for government jobs. This infiltration defeats the winning group's purpose, as it dilutes the "dividend" each original member receives. In large communities of millions of citizens it can be quite costly to keep track of the genuine members so as to successfully discriminate against the non-members. The costs of ex-post enforcement may help explain why some societies manage to avoid conflict and enjoy broad-based participation in the nation's wealth.

Conversely, distributive conflict and discrimination should be more likely when it is possible to form groups along lines that facilitate the ex-post policing of group borders, so as to minimize leakage. One such set of circumstances may arise in societies with multiple ethnic groups. When groups can be formed along ethnic lines, ethnic identity can be used as a marker to recognize potential infiltrators. By lowering the cost of enforcing membership in the winning group, ethnic diversity makes the latter less susceptible to *ex-post* infiltration by members of the losing one. Hence, for a group that expects to prevail in a conflict, a bid for a country's resources is an *ex-ante* more profitable proposition if this bid occurs along ethnic lines than if it occurs along non-ethnic (and therefore more porous) lines.

Ethnic discrimination, exploitation, and conflict are frequently in the news, and pervasive throughout history. In many countries ethnic groups are or have been visiting violence on each other, sometimes on a horrific scale (the word "genocide," by definition, refers to a type of ethnic conflict). Fearon and Laitin (2003) identify no less than 58 ethnic civil wars between 1945 and 1999, constituting 51% of the total number of civil wars.[1] Less visible and newsworthy, but quite possibly much more pervasive, is non-violent ethnic conflict. Non-violent ethnic conflict can take multiple forms. In some countries ethnic groups compete through overtly ethnic parties, vying for power. Even more often a dominant group discriminates against and exploits the others. As Esman (1994) succinctly puts it "when an ethnic group gains control of the state, important economic assets are soon transferred to the members of that community" (p. 229). By suggesting that ethnicity helps enforcing the dominant's

[1] Of the remaining 56 civil wars an additional 20 is classified as "ambiguous," in the sense that Fearon and Laitin are not sure whether it was faught along ethnic lines or not (their definition of "ethnic" war).

group monopoly of the country's assets, we hope to help explain these observations.

Yet, and crucially, ethnic conflict is by no means universal in ethnically heterogenous societies: in many countries ethnic groups coexist peacefully. Nor is it constant over time: many ethnically heterogenous societies experience long (sometimes very long) periods of fairly harmonious ethnic relations before or after periods of conflict. Why do some countries experience ethnic conflict and others don't? Why does ethnic conflict wax and wane over time in the same country?

An implication of our conception of ethnicity as a boundary-enforcement device, is that not all ethnic distinctions are equally effective ways of enforcing group membership. In particular, it is possible that some types of ethnic identities are harder to shed than others. One reason for this is that some ethnic identities are more easily observed by members of other groups. The clearest case of this is the case of skin color, or other physical characteristics that differ markedly among ethnic groups. Ceteris paribus ethnic boundaries based on physical differences should be easier to police than boundaries based on non-visible differences. Another reason why not all ethnic cleavages are equally resistant to passing is that the psychic costs of giving up one's ethnic identity may vary with the nature of that identity. For example, in some cases passing from one group to the other may require religious conversion, while in others both origin and destination groups have the same religion. Abandoning one's religious identity may be more costly psychologically than abandoning other traits of one's cultural identity. Furthermore some religions create physical markers, such as circumcision or scarring, that further increase the cost of passing.[2]

To capture this heterogeneity, we build on the notion of *ethnic distance*.[3] In our model ethnic distance is the cost to be born by a member of one group to successfully pass himself as a member of the other group. In general, we would expect ethnic distance to be maximal when there are differences in skin color and other physical characteristics that make passing all but impossible. Distance may be fairly high in the case of religious differences among groups. Language barriers could plausibly be argued to be a somewhat weaker source of distance. Potential infiltrators can assimilate through learning the language, or more realistically through having one's children do so. Finally, ethnic cleavages that are only marked by a shared sense of identity or history, unsupported by additional differences

[2]Maimonides in the late 12th century explains the practice of circumcision as a way of preventing "strangers" from saying they are members of the faith. "For sometimes people say so for the purpose of obtaining some advantage." Needless to say the practice has backfired when circumcision has been used to identify Jews for the purposes of persecution, as depicted most memorably in Luis Malle's *Au Revoir les Enfants* (1987).

[3]A notion of group distance is also important in Esteban and Ray's (1994, 1999) measures of polarization and their subsequent work on ethnic conflict (reviewed below). However in their context distance is best interpreted as distance in preference or income space, not in terms of ease of migration among groups.

of color, religion, language, or other observable characteristics, should be associated with the lowest levels of ethnic distance.[4]

We begin by formalizing our concept of ethnic distance, and deriving its implications for ethnic relations, in a model of exploitation/discrimination. In this model a dominant group decides whether or not to appropriate society's resources at the expense of a weaker group. Members of the weaker group can only respond by "passing" into the dominant group, so ethnic relations are either peaceful or characterized by exploitation. We then extend the model to also allow for the weaker group to collectively "fight back." In this extended model there are three possible outcomes: peace, exploitation, and open conflict.

In both models the peaceful outcome is supported by low levels of ethnic distance. The further the distance, the most limited the passing from the losing/exploited group into the winning/dominant group, and hence the greater the reward from conflict behavior for the latter. It also turns out that the peaceful outcome fails to prevail for intermediate levels of expropriable assets – resources that can be captured through exploitation/conflict – as a share of overall income. In our model an increase in the share of expropriable assets has two opposing effects on the incentive to engage in appropriation. It increases the "prize" to be gained by the dominant group, and hence its incentive to seek conflict. But it also increases the incentive for the losers to pass into the dominant group, enhancing the dilution effect from infiltration, and thus reducing the incentive for appropriation by the prospective dominant group. Hence, exploitation and conflict prevail for intermediate levels of the expropriable-resource share in total wealth. The two models have further comparative-statics predictions with respect to the inter-group distribution of wealth, the pre-conflict relative size of the groups, and the destructiveness of conflict, which we discuss in detail after characterizing the equilibrium.

Given these results, cross-country differences in proneness to exploitation and conflict would result from differences in all the determinants just listed, and transitions from one form of ethnic relations to another would equally be driven by changes over time in these determinants. Particularly likely seem changes in the share of expropriable assets in total wealth, and we discuss below a number of historical examples where we conjecture such changes may have led to long-run changes in ethnic relations. Changes in ethnic distance due to changes in the perceived psychic costs of passing seem also possible, and so are of course changes in the relative wealth of the groups, changes in relative group size (for example due to migration or differential population growth), and of course changes in conflict technology that may make conflict more or less destructive.

[4] Needless to say, ethnic boundaries can be and often are multi-dimensional, involving various combinations of physical, religious, linguistic, and other cultural differences. Ethnic distance is the cumulative effect of these differences.

Another source of distance is of course geography. Our model applies equally well to groups that form based on the geographical base of their membership. When one group's army enters a city in enemy territory, its soldiers can be pretty confident that the overwhelming majority of the civilians they encounter belong to the enemy group. Hence, our theory of conflict among geographically separated groups is isomorphic to our theory of ethnically distant groups, and one may therefore be able to use our model, together with other relevant state variables identified in this paper, to explain changes over time in the intensity of inter-regional (and perhaps even international) conflict.

It is important to stress that we are not arguing that conflict will *only* arise in societies with deep ethnic divides. If the benefits of conflict are large enough, a group aiming to exclude the rest of the population may arise even in relatively homogenous societies: this group will tolerate a certain amount of leakage and/or will be willing to pay relatively large costs to set up artificial methods to enforce membership (e.g. party affiliation). We are merely saying that, *ceteris paribus*, distance increases the likelihood for conflict, particularly if the other conditions listed in the text are satisfied.

The rest of the paper is organized as follows. In the next section we review related theoretical literature on the causes of ethnic conflict, as well as the nature of ethnicity and ethnic identity. Section 3 presents our model of exploitation, and 4 presents the richer model where appropriation behavior can results either in exploitation or in open conflict. Section 5 goes back to the literature: it looks at studies that provide empirical and historical underpinnings to our key notion of ethnic distance, and how it relates to "passing" between ethnic groups. It also relates the model to existing empirical evidence on ethnic conflict. Finally, we discuss how our model can contribute to the understanding of a number of historical examples that we think our theory sheds some light on, including Black-White relations in the United States and South Africa; Hutu-Tutsi relations in Rwanda and Burundi; Muslims and Hindus in India; and others.

2 Related Literature

The paper contributes to the literature, too vast to survey here, on distributive conflict among social groups. Much of this literature begins with a partition of society into groups (variously identified by social classes, ideology, ethnicity, etc.) and then proceeds to study why, when, and how intensively a distributional conflict will take place. Our contribution to this literature is to highlight concerns with ex-post infiltration as a potential deterrent for conflict. This focus allows us not only to generate new insights on when two or more social groups will enter into conflict, but also to shed light on which types of social cleavages are more likely to be associated with conflict. In particular, *ceteris paribus* conflict should be

more prevalent when passing from one group to the other is more difficult. One cleavage that is often difficult to cross is the one between ethnic groups. Hence, we can use our insight as a basis for an explanation for why social conflict appears to be so frequently along ethnic lines. The rest of this section discusses (selectively, for lack of space) other attempts to answer the same question.

Our interpretation of ethnic conflict belongs to the "instrumentalist" tradition most often associated with Bates (1974, 1982). Bates' foremost point is that ethnic conflict is conflict among rational agents over scarce resources. He buttresses this claim by organizing an astounding wealth of case-studies from Sub-Saharan Africa. Many subsequent scholars have identified numerous further examples where leaders favor their own ethnicity when allocating resources [see e.g. Posner (2005) for Africa.] Taking Bates' view of the reasons for conflict as our starting point, we formalize the reasons why ethnicity is a rational basis for coalition building and provide a characterization of some of the conditions that make ethnic conflict more likely.

Within the rich political-science instrumentalist literature on ethnic conflict two significant antecedents are Chandra (2004) and Fearon (1999). Chandra argues that voters find collecting information on candidates' background and intentions costly, while ethnicity is readily observable. Hence, they use ethnicity as a noisy but low-cost signal of candidates propensity to favor them in allocating public goods and transfers. Given this behavior by voters, it can be rational for parties to organize along ethnic lines. There is some connection between Chandra's use of ethnicity as a low-cost signal of intentions and our use of ethnicity as a low-cost technology to police coalition boundaries, and our analyses are somewhat complementary. The closest antecedent to our work, however, is Fearon (1999), who asks why ethnic politics and "pork" politics often tend to go together, and conjectures informally that allocating pork according to ethnicity (or other features that are not easily chosen or changed by individuals) is a way of preventing political losers from attempting to enter the winning group.

In economics there is a growing literature of formal models of social and international conflict. A subset of this literature focuses (or can be interpreted as focusing) on ethnic conflict. Robinson (2001) and Esteban and Ray (2008) study societies with both class and ethnic cleavages and ask when one should expect to see ethnic as opposed to class conflict (or no conflict). Esteban and Ray (2011) focus on the role of within- and between-group income differences in determining conflict intensity. Esteban and Ray (forthcoming) investigate the relation between the intensity of conflict and various measures of heterogeneity used in the empirical literature. Padró i Miquel (2007) focuses on autocrats' exploitation of ethnic fears in order to extract rents while imposing severe distortions on the economy. Rohner (2010)

and Rohner, Thoenig and Zilibotti (2011a) model the two-way interaction between conflict and trust.

In all these studies the division of society into groups is fixed and immutable. Furthermore, ethnicity is an entirely arbitrary labelling of individuals with no clear economic role. The distinctive feature of our model is that it is based on a concrete economic interpretation of ethnicity: it provides a (possible) marker for policing group boundaries. Several distinctive novel insights derive from having taken this stand. First, the general insight that concerns with ex-post infiltration may be a potentially important deterrent for conflict. Second, that not all ethnic cleavages are equally likely to lead to conflict (while the current literature is silent on this kind of heterogeneity). Third, that the ethnic composition of a country is endogenous to conflict. Fourth, that the relationship between resource-endowments and conflict is non-monotonic.[5]

The paper also contributes to the literature on the construction and salience of ethnicity. Two closely-related propositions enjoy near-universal consensus in this literature. The first proposition is that ethnicity's "salience" changes over time, both within the lifetime of individuals and in terms of wider societal perceptions. In other words individuals and communities ascribe to ethnic identities more importance in certain periods than in others (and sometimes no importance at all). This view is entirely consistent with our framework. Indeed, our model offers an explanation for why ethnicity's salience varies across time and space. In the model periods of harmonious relations may be interpreted as periods where ethnicity is not salient, while periods where conflict or exploitation take place are periods where ethnicity has become salient. As discussed, such transitions from non-salience to salience can be triggered by changes in macro-economic conditions, changes in the wealth status of certain groups, or changes in the perceived social cost of conflict.

The second widely held view is that ethnic identity is a "social construct," in the sense that it results from social "discourses" that end up conditioning individuals to identify with particular groups. This idea seems implicit in Barth (1969) and has been extensively elaborated. A famous application is in Anderson (1983). Social constructivism is in opposition to an alternative approach that views ethnic identity as an immutable feature of human nature.[6] Once again our contribution is fully consistent with the social-constructivist position. In our framework, like in much instrumentalist writing on ethnic conflict, ethnic groups are socially constructed to build winning coalitions.[7] Our twist on social constructionism is to point out

[5] Berman (2000, 2009), and Berman and Laitin (2008) model mechanisms leading to group identity and cohesion. While the context is radical religious groups, these contributions share with ours a focus on the policing of group boundaries.

[6] See Fearon and Laitin (2000) for an excellent discussion of the relation between social constructivist views of ethnicity and theories of ethnic conflict.

[7] Harris and Sim (2002) say "... advocates of this social constructionist perspective on race maintain that

that such discourses are easier to make where there exist markers (of color, or language, or religion, etc.) around which the discourses can be organized. In other words it is easier to create a social construction of identity when this identity can be pegged on the hook of, say, skin color than when such a hook is absent.[8]

3 A Model of Exploitation

3.1 Assumptions

We study a society populated by a continuum of individuals of measure 1. Each individual is initially assigned to one of two groups, A or B.[9] The initial size of group A is n (so the initial size of B is $1-n$). Within each group, all individuals are identical. Each member of group A (B) has an initial exogenous income stream y_A (y_B) from assets that cannot be expropriated. One may loosely think of y_A as human capital. In addition, society is endowed with aggregate resources that generate an income stream of z, that must somehow be distributed among the population. z could be the rental value of land, mineral resources, or any other endowment that is valuable to a country.

We will assume that one of the two groups is "stronger" and can set up an exploitation regime. We have in mind that one of the two groups has greater fire power and can largely impose its will. In many cases the stronger group will be the numerical majority. However, in some cases minorities may be stronger if they can mobilize greater resources per capita, or equivalently have greater human capital (e.g. South Africa during Apartheid). Without

the function of race is to reinforce and perpetuate social differences."

[8] In this respect our approach shares some features with van den Berghe's (1978, 1981, 1995) theory of ethnic identification and racism. Building on evolutionary psychology, Van den Berghe argues that agents are strongly motivated by "nepotism," an evolutionary-driven tendency to seek to benefit individuals who are more likely to share a larger proportion of one's genotypes. This induces agents to look for cues that can provide some information on common ancestry, such as skin color and *visible* physical features (leading to racism) or cultural markers (leading to ethnic identification). Like us, van den Berghe stresses the gradient among possible markers of ancestry: "where physical, genetic markers do a reliable job of differentiating between groups they *are* used," but "most ethnic groups *look* so much like their neighbors that they *must* rely on cultural markers of distinction" (1995, p. 361). He then goes on to discuss the relative effectiveness of dress, cultural markers which permanently change physical appearance (such as scarification), language, etc. The difference between van den Berghe and us is that we do not require nepotism for agents to be interested in identifying markers that lower the cost of policing group boundaries - our agents are purely selfish. Furthermore, van den Berghe's analysis does not directly address fluctuations over time in the salience of racial and ethnic identities.

[9] It is conceptually straightforward to extend the model to the case of more than two groups, though it becomes difficult to obtain closed-form results. The multiple-group extension is discussed in Unpublished Appendix 3.

loss of generality we assume that A is the stronger group.[10]

Group A then chooses between two actions: C (for conflict) or P (for peace). We don't model the specific mechanism through which this collective decision is taken, but we assume that the choice maximizes the utility of agents who start out as members of group A.[11] If group A chooses C, it takes hold of the common resource z, to the exclusion of the members of the other group from enjoyment in it. Exploitation is costly. If group A decides to seize control, a fraction δ of all the country's resources is lost. There are several possible interpretations of the cost δ. It could represent the cost of the repressive apparatus needed to enforce the exploitation of group B. It can also represent the deadweight cost of discrimination. For example, exploitation may call for excluding talented members of group B from administrative and managerial posts (and having to search further down the talent distribution of group A to replace them). Net of this cost, conflict results in a reallocation of the common resource z to group A, with the *ex-post* (i.e. end-of-game) members of the group sharing equally in it. If group A chooses action P, z is divided equally among all citizens.[12][13]

Group A's conflict or peace decision takes up the first stage of the game. In the second stage, members of the weaker group decide whether to keep their identity, or to "pass" and join the majority.[14] Passing is individually costly. Consider, for example, the case where groups A and B correspond to different ethnicities. At the simplest level, changing ethnic group may involve considerable loss of ethnicity-specific human capital. For example, one may have to sacrifice business contacts, or leave a profession that has an ethnic connotation to it. Changing identity will almost invariably also involve geographical relocation to an

[10] We could formalize the definition of stronger by saying, for example, that group A is stronger if its aggregate wealth is greater, i.e. $y_A n > y_B(1-n)$, but since the formal definition of "stronger" plays no role in the subsequent analysis we leave other possibilities open.

[11] Because all of the members of group A are identical, almost all rules to aggregate preferences will give rise to the same decision as of whether to exploit or not to exploit group B, as long as the spoils are shared equally among group A's members. In turn, the equal-sharing option would be the natural choice on a "behind the veil of ignorance" basis.

[12] In Unpublished Appendix 2 we relax the assumption of within-group equal sharing to allow for a distinction between leaders and followers, where leaders enjoy a disproportionate share of the rewards from conflict. Our results are robust to this modification.

[13] There is here, and even more clearly in the extension of Section (4), where we look at the possibility of Group B fighitng back, an implicit assumption that groups cannot precommit to act cooperatively. In the present context, group B could agree to cooperate to its own exploitation (saving the economy the cost δ) while still allowing A to take all of the pie. We implicitly assume that if A lets down its guard, say by eschewing a repressive apparatus or by allowing talented members of groups B to take on important jobs (but none of the benefits) group B will then have an incentive to renege and try to keep some of z for itself.

[14] It will be obvious below that members of the stronger group never pass in this simple version of the model. In the richer model of Section 4, where group B can "fight back," or even attempt to exploit group A, members of group A may also wish to pass.

area where one's ancestry is not known, with attendant further loss of business contacts or location-specific human capital. It may also involve some kind of primitive surgery, the payment of bribes to counterfeit identification documents or change names, payments to families of other groups in order to marry (one's children) into them, etc. Finally, there are the obvious, and often very large, psychic costs associated with the loss of one's social and cultural identity.

It seems plausible to assume that passing costs have both an additive component and a component proportional to income. For example the losses of ethnic- or location-specific human capital or the need to fire sell assets in the process of relocation are likely to be proportional. The suppliers of surgery or fake documents may also have private information on wealth, and demand a proportional payment. On the other hand, psychic costs are probably less dependent on income, and hence better captured by an additive term. Overall, then, the cost of passing from B to A might be modelled as $\phi_0 + \phi y_B$, with ϕ and ϕ_0 both parameters capturing the additive and proportional component of the passing cost, respectively. As it turns out, none of the qualitative results are affected by the inclusion of the additive term, so we will set $\phi_0 = 0$ in the remainder of the paper.[15]

A key idea is that the passing cost ϕ will depend on the nature of the criterion by which agents are classified as members of A or B. If the two groups are perfectly identical in average characteristics, we when the labels A and B are randomly assigned, or the population itself is perfectly homogenous, then passing should be costless, or $\phi = 0$. On the other hand ethnic identities are often harder to shed than other types of social labels, or categories, as the technical difficulty of passing (e.g. skin color), or the psychic costs (e.g. religion), are greater. Hence, on average societies that are characterized by ethnic distinctions will have higher ϕ parameters than ethically homogenous societies. Ethnically homogenous societies may have other types of potential groupings, e.g. by ideology, but such alternative partitions will tend to feature a lower ϕ.

Even so, this does not mean that all ethnically diverse societies will have the same ϕ, as ϕ will depend on the nature of the ethnic distinction (race, religion, skin color, etc.). For example, it is clearly more costly for a person with very dark skin to pass himself off as white (impossible) than for a low-caste Hindu to become Catholic (painful, perhaps, but feasible). We therefore assume that ϕ can vary continuously from zero (to capture a completely homogenous country) to infinity.

[15] The converse is not true: in the special case of $\phi = 0$ we would lose the result, derived below, that an increase in y_A can trigger a transition from peace to exploitaton. While this is not the most distinctive new result of the paper, it is still interesting and, as discussed, we do believe that passing costs have a proportional component. This is why we focus on the $\phi_0 = 0$ case and not on the $\phi = 0$ case.

Identity switchers cannot be separately identified from original members of the group.[16] The number of ex-post members of group A is denoted n', and is equal to n plus the number of initial members of group B who switched identity. After individuals have made (and executed) their ethnic identity decision, resources are allocated based. Individuals derive utility exclusively from consumption, and consumption equals income.

Society can be characterized by the initial relative group-size n, non-expropriable endowments y_A and y_B, aggregate resources z, switching cost ϕ, and exploitation-cost parameter δ. Given these characteristics, group A decides collectively whether or not to engage in conflict, and individuals of group B choose their ethnic identity, giving rise to n'.

3.2 Equilibrium

Consider the first-stage decision by group A whether or not to exploit group B. If A decides for peace (action P) its per-capita payoff is simply

$$U_A^P = y_A + z. \tag{1}$$

I.e., members of group A have complete access to their initial endowment, as well as to the common resource z, which is divided equally among all members of society. If instead, they decide to seize control of z (action C) their payoff is

$$U_A^C = (1-\delta)\left(y_A + \frac{z}{n'}\right). \tag{2}$$

Hence, exploitation leads to the loss of δy_A units of the individual endowment as well as δz units of the collective good. On the other hand, through action C group A obtains full control of the natural resource. This amount is divided equally among the final membership of group A, n'.

It is clear by comparing the last two expressions that group A's decision as to whether or not to play C depends on the equilibrium response of n' if it does so: the greater the expected ex-post size of group A in the event of a conflict, the less likely group A is to seek it. For example, it is immediately apparent that there will be no equilibria where a C action induces *all* of the members of group B to switch identity: with $n' = 1$ we have $U_A^C = (1-\delta)[y_A + z]$, which is certainly less than U_A^P. More generally, by comparing eqs. (2) and (1), we see that group A will seek to exploit group B if and only if $n' < \tilde{n}$, where

$$\tilde{n} \equiv \frac{(1-\delta)z}{\delta y_A + z}.$$

[16] We are implicitly assuming the individual income is private information. This assumption seems fairly realistic for most settings. This assumption would not be needed in a model with heterogeneity in within-group incomes. However such an assumption introduces potential within-group conflicts of interest that would distract from the main focus of this paper.

This "exploitation threshold" is increasing in z, falling in the cost of exploitation δ, and falling in the income of the victorious group y_A: the richer group A is, the more it is concerned about the destructive effects of exploitation. Note that $\tilde{n} < 1$.

In case A plays C each member of group B decides his ethnic identity.[17] If he passes to group A he receives utility

$$U_B^S = (1-\delta)\left[(1-\phi)y_B + \frac{z}{n'}\right],$$

where the first term in the square bracket reflects the cost of changing identity and the second term is the gain represented by access to resources seized by group A. Since there is exploitation all resources are net of the cost δ. If he sticks to his original identity his utility is

$$U_B^{NS} = (1-\delta)y_B.$$

The pro of passing is that it allows the passer to retain access to the common resource. The con is that one has to pay the switching cost.

Note that the gain from switching is decreasing in n'. For low values of n' the gains from defecting are relatively large, as the spoils of exploitation are divided among few people. As n' increases an infiltrator's share falls, and so does the incentive to pass. Hence, passing by some reduces the incentive for further passing by others. Indeed, for n' large enough gaining access to z is not a sufficient compensation for the switching cost, and the net incentive to pass may become negative. In particular, we have that members of group B pass as long as $n' < \overline{n}$, where

$$\overline{n} \equiv \frac{z}{\phi y_B}.$$

The "switching threshold" $\overline{n}$ is increasing in the spoils of conflict z (the bigger the pie, the larger the number of people one is willing to share it with), and decreasing in the cost of switching ϕy_B. Note that it is possible for $\overline{n}$ to be larger than 1. These are cases in which, under exploitation, members of the weak group have an incentive to defect at all values of n' (the pie to share is just too large relative to the cost of changing sides).

The equilibrium value of n' when A plays C depends on the relative positions of the initial group size n and the switching threshold $\overline{n}$. If $n < \overline{n}$, and exploitation occurs, citizens of group B will start switching to A. If $\overline{n} < 1$ the flow of defectors will stop when no further incentives to switching are left, i.e. the equilibrium value of n' is $\overline{n}$. If $\overline{n} > 1$ the flow of defectors will stop when all members of group B have switched sides, i.e. $n' = 1$. On the other hand, if $n > \overline{n}$ there are already "too many" people in group A to start with, and

[17] It should be obvious that there is no switching by members of group B if there is no conflict (they would pay the switching cost, but gain nothing).

no member of group B wishes to switch. The equilibrium in this case features $n' = n$. In summary, if the dominant group A seeks to exploit group B, we have $n' = \max[n, \min(1, \overline{n})]$.

Recall now that group A seeks to exploit group B if it does not expect too much switching in response, i.e. if $n' < \tilde{n}$, where $\tilde{n}$ is the "exploitation threshold." We therefore have exploitation if $\max[n, \min(1, \overline{n})] < \tilde{n}$. Recall also that $\tilde{n} < 1$ (A never plays C when everyone switches to A), so there can never be exploitation if $\bar{n} \geq 1$. This allows us to simplify the condition for exploitation to

$$\max(n, \overline{n}) < \tilde{n}. \tag{3}$$

We summarize this discussion with the following

Proposition: *Group A exploits group B if and only if (3) holds. If, furthermore, $n < \bar{n}$, then there is switching from B to A, and $n' = \bar{n}$. Otherwise $n' = n$.*

If $n < \overline{n} < \tilde{n}$, then there is exploitation, and the equilibrium value of n' is $\overline{n}$. The size of the dominant group is sufficiently small that members of group B switch, but not in large enough numbers to make action C unprofitable for the dominant group. For $\overline{n} < n < \tilde{n}$ there is still exploitation, but no switching. The exclusionary benefits of appropriating z are large enough for the dominant group to play C, but not large enough for members of the weak group to incur the switching cost ϕ. For $n > \tilde{n}$ it is never worth it for the dominant group to exploit the small minority in B. Finally, if $n < \tilde{n}_A < \overline{n}$, group A would benefit from taking control of z if its ex-post size was the same as its ex-ante one, but it expects too much switching in equilibrium, so it does not attempt it.

3.3 Comparative Statics

Depending on the configuration of parameters ϕ, δ, n, z, y_A, and y_B, a country will or will not experience an ethnic conflict. We want to know how the "exploitation" v. "no exploitation" status changes as these 6 parameters vary. Substituting the expressions for $\bar{n}$ and $\tilde{n}$ in (3) we easily get that exploitation occurs if and only if (i) $n < (1 - \delta)$ and, (ii)

$$\frac{\delta y_A n}{(1-\delta) - n} < z < (1-\delta)\phi y_B - \delta y_A. \tag{4}$$

The comparative static properties of the model follow immediately from (4). The following describes the region of the parameter space where exploitation occurs: relatively high values of the passing cost ϕ; intermediate values of the resource-rent flow z; relatively low values of the income of the stronger group A, and, relatively high values of the income of the weaker group B; relatively small relative sizes of the dominant group A; small sizes of the cost of conflict δ.

It is also of interest to ask which parameters are associated with more passing in case

of exploitation. Since passing occurs when $\bar{n} > n$, or

$$\frac{z}{\phi y_B} > n,$$

more passing (conditional on exploitation) is associated with smaller ϕ, y_B and n, and with larger z.

We further illustrate and discuss our results with the help of Figure 1, which measures z on the horizontal axis, and ϕ on the vertical axis. The figure features a large triangle denoted "conflict." This is the set of (z, ϕ) combinations that satisfy condition (4), and hence give rise to exploitation of B by A (holding constant the other parameters). Outside of this triangle A does not attempt to gain control. The "conflict" region is further divided into two triangles. The "no switch" triangle corresponds to combinations of parameters such that all the members of group B stay in group B, while the "switch" triangle features some switching from B to A.

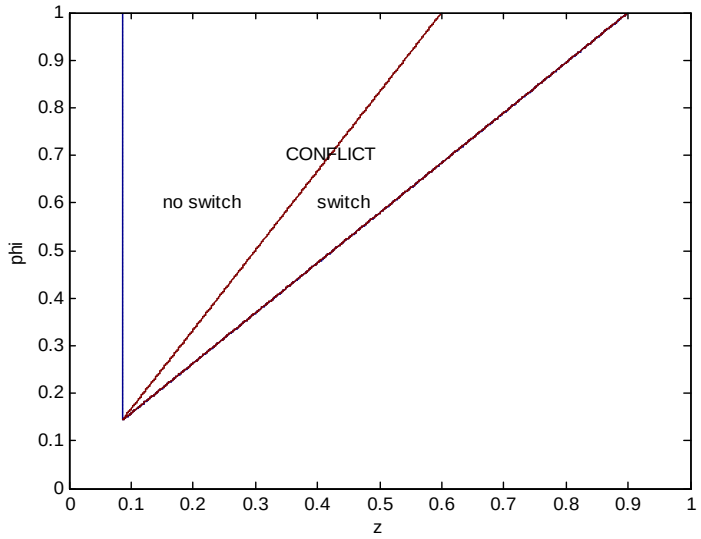


Figure 1: Exploitation v. peace as functions of z and ϕ

The figure shows a (weakly) positive relationship between exploitation and distance, ϕ. For given z/y, there is no exploitation if ϕ is very low, and there is exploitation if ϕ is high enough. Hence, proximity acts as a deterrent to conflict: the dominant group eschews any attempts at exploitation when it expects a large inflow of group B members should it try to do so. A low ϕ allows for such a massive switching.

The figure also shows an "inverted-U shaped" relationship between z/y and exploitation. Moving from left to right for a given (sufficiently high) value of ϕ, we see that there is no exploitation for z low - it does not pay. However, exploitation also disappears as an

equilibrium for z large. The reason is that the larger is z the larger is the number of B members who switch to A grabs z. Anticipating this massive switching, group A backs off. Hence, A exploits B only if z is large enough to make for an appealing booty, but not so large that it triggers a massive switching from B to A. However, the existence of a "switch" sub-region in the conflict region shows that A can tolerate a moderate amount of infiltration and still pursue exploitation.

Figure 1 also highlights the interaction between ethnic distance ϕ and abundance of resources z. In particular, the greater the ethnic distance the larger the set of values of z such that exploitation occurs. The intuition is immediate from the previous discussion: the more costly it is to switch, the smaller the elasticity with respect to z of inter-group migration in response to conflict. Hence, the greater the ethnic distance, the more aggressive group A can be in appropriating large amounts of riches.

Finally, the figure shows that, not surprisingly given the discussion above, switching occurs for relatively low ϕ and relatively high z, with a similar interaction between these variables as found in the decision of A.

Changes in group incomes can also be illustrated with reference to Figure 1. An increase in y_A causes the vertical line to shift right and the diagonal line to shift left, shrinking the conflict region. As group A becomes richer (relative to the resource endowment) we move from exploitation to peace. This is the standard insight that the stronger group is more interested in conflict when the resources at stake are abundant, relative to the cost of conflict (which is indexed by the group's human capital). An increase in y_B causes the diagonal line to rotate clockwise, thereby expanding the conflict region. The reason for this is more specific to our model. Since (some) passing costs are proportional to income, high income agents have more to lose from switching identity. Hence, exploitation is more likely when the stronger group has low per-capita income and the weaker group has high per-capita income (always relative to the resource endowment).

An increase in the dominant-group size n shifts the vertical line in Figure 1 to the right, so that the conflict region shrinks. In particular, there are now fewer values of ϕ and fewer values of z/y for which exploitation occurs. A larger initial size of the stronger group implies a smaller per-capita gain in the amount of natural resources appropriated through action C, and hence a smaller incentive. Indeed, as per condition (i) above, there always are values of n that are large enough that no conflict occurs (the conflict region disappears). This particular result will receive some qualification in Section 4, when we allow group B to "fight back."

Increases in δ have very similar effects as declines in ϕ. Increases in δ tend to reduce the set of other parameter values such that there A plays C (the "conflict" area with a larger

δ is always a subset of the area with a smaller δ). For δ large enough we are always in the peace region. Indeed, there is always a neighborhood of $\delta = 1$ such that exploitation does not take place, irrespective of other parameters' values.

3.4 Summing Up

In sum, if group A is the stronger group, we are more likely to observe exploitation of group B by group A if: (i) The ethnic distance between A and B is large; (ii) the country's endowment of expropriable resources is neither too small nor too large; (iii) group B has high per-capita income; (iv) group A has low per-capita income; (v) group A is small; and (vi) the efficiency costs of exploitation are modest.

It is very important to stress that for *all* variables the threshold values that trigger exploitation are defined in terms of the other variables in the model. For example, the lower δ the lower the required threshold for ϕ. This has important empirical implications. For example, consider the potential inverted-U shaped pattern that the theory predicts for the effect of variation in z on the peace-conflict status of a country. The upper threshold is clearly increasing in ϕ and, indeed, if $\phi = \infty$ then the relationship between z and conflict status becomes monotonic: since switching identity is prohibitively expensive, the deterrent effect of switching does not counter-balance the incentive to fight for a larger z. Hence, the model predicts that the width of the U shape depends on the value of ϕ.

4 Exploitation v Conflict

In the model of the previous section, when group A goes on the offensive and decides to appropriate the resource z, the only choice open to members of group B is whether or not to pass themselves off as members of the dominant group. The model does not distinguish between situations in which the losers "surrender," and give the winners free reign on the country's resources – a situation we have termed "exploitation" – and one where the losers "fight back," and try to retain control over at least some share of the country's resources – a situation for which we now specialize the meaning of the word "conflict." We now turn to a simple extension that accommodates a distinction between these two outcomes.

We continue to assume that, realistically, the stronger group, group A, moves first, and chooses between a "conflict action," C, and a "peace action," P. However, we now introduce a new second stage where group B can also respond with a C action or a P action. Furthermore, in the third stage we now explicitly consider not only the possibility of switching from B to A, but also from A to B.

The consequences of various series of actions are as follows. If both groups have played

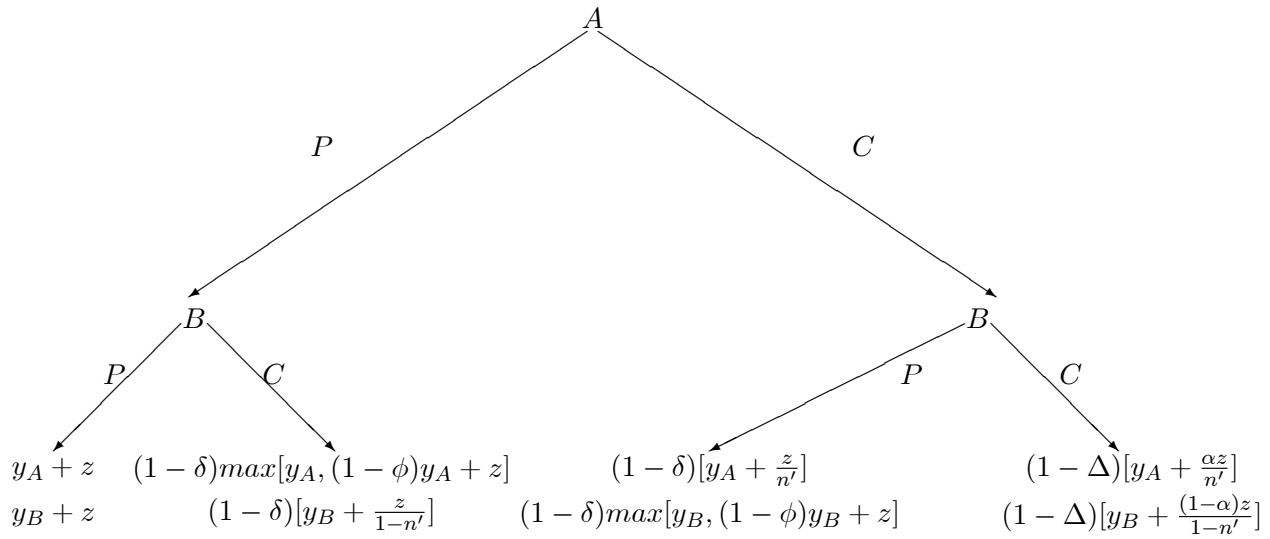
P, peace prevails, and each group i receives $y_i + z$, i.e. their "inalienable"endowment y_i plus an equal stake in the country's natural resources. This is the same as the no-exploitation equilibrium in the previous section's model. If one of the two groups has played C, and the other group has played P, we are in a situation where the C–playing group is exploiting the P–playing group, which acquiesces. In this case, the $C-$playing group gains control of all the natural resources z, which are then shared among the *ex-post* members of this group. Exploitation has enforcement costs and/or introduces distortions that reduce all incomes by a fraction δ. This is analogous to the "exploitation" scenario of the previous section, except that we leave open the possibility that group B exploits A, and not only A exploits B.

The more radically new type of scenario that is possible in this extension pertains to the outcome when both groups play C. We now assume that in this case the stronger group, group A, receives a fraction α of the natural resource, with $\alpha > 0.5$, while the weaker group, say B, receives the remaining $(1-\alpha)$. Hence, relative to acquiescing to being exploited by A, and losing all control over z, B can "fight back" and retain some fraction, albeit less than its "fair share," of the country's endowment. However, this fighting-back option comes at a cost. We assume that open conflict causes greater social losses than exploitation. The destruction rate of output in the CC equilibrium is $\Delta > \delta$.

The extended form of the game is (partially) depicted in figure 2, where at each final node the payoff of A is listed first and the payoff of B second. The interpretation of the payoffs is straightforward in the PP case, where peace prevails. In the cases of exploitation (PC or CP) the exploiting group receives its own endowment y plus z divided by the number of ex-post group members, both depreciated at rate δ. The exploited group's payoff depends on this group's passing behavior. Non-passers receive only their individual endowment y. Hence if there is no passing, or if passing occurs until members of the exploited group have become indifferent between switching and maintaining their identity, the payoff for members of the exploited group is $(1-\delta)y$. On the other hand, if all the members of the exploited group pass over to the exploiting group, their welfare is $(1-\delta)\left[(1-\phi)y + z\right]$. In other words they pay the switching cost but recover access to their share of the country's resources. Universal passing of the group occurs when this last quantity exceeds $(1-\delta)y$, which explains the formula for the exploited group's payoff.

The payoffs in case CC, or open conflict, also depend on switching behavior. We show later that only members of group B switch to A, if at all. In equilibrium, members of group B prefer to remain in their original group, or are indifferent between switching and not switching. (Note that since stayers get some positive amount of the natural resource, there is no possibility that the entire membership of the group will switch identity.) Hence, the utility of members of group i in case CC is y_i plus the per ex-post member amount of natural

Figure 2: The 3-Stage Game



resource that the group manages to preserve in the conflict. This payoff is now discounted at the higher rate Δ.

Solving this version of the model is conceptually straightforward. For each of the four final nodes PP, PC, CP, and CC one needs first to determine the equilibrium ex-post group sizes, or n'. Given n' one can determine whether B prefers PP or PC, and whether it prefers CP or CC. This provides A with B's response function to its actions. Given that, A chooses its best option between P and C.[18] The formal analysis, which is quite tedious, can be found in the online appendix to the paper.[19] Here we describe the properties of the equilibrium and the comparative statics.

The general structure of the model of this section can best be discussed with reference to Figure 3. In the figure we hold constant y_A, y_B, α, n, δ, and Δ, and study how the nature of the equilibrium vary as we vary ϕ and z. Each type of equilibrium is identified by the final node reached in the game between ethnic groups.[20] As in the benchmark model, there is a broadly triangular region featuring some type of conflict, while the complement features peace. Hence, peace prevails for low values of the passing costs ϕ, and for values of z that are neither small or large, but not intermediate. We also see again the important interaction between z and ϕ: as ϕ increases conflict occurs for a larger range of values of z.

One new feature of the equilibrium is that attempts to capture the resource z can now result in either exploitation or open conflict. In particular, there is an "inner triangle" featuring open conflict, CC, and outside "corridors" featuring exploitation by A on B, CP. Finally, between the left CP corridor and the inner CC triangle there can be a region, PC, where B exploits A, rather than the other way around. Hence, for ϕ sufficiently large, as z increases from a sufficiently low value, the economy potentially transitions from peace, to exploitation of B by A, of A by B, to open conflict, back to exploitation by A, and finally back to peace However it is important to note that not all these regions necessarily exist.

[18] As already discussed in footnote 13 we implicitly rule out side deals. For example, an interesting variant of this model would give group A the option of offering to group B a division of Z which is more favorable to A than under the PP equilibrium, but not as favorable as under the CP or CC equilibrium. While such arrangements are sometimes observed in reality, they do heavily depend on both parties being able to make binding commitments. For example typically partial exploitation will require that the dominant group controls all the resources, and hands out group B's agreed share voluntarily and on an ongoing basis. It may be very difficult for B to monitor that this is appropriately done, particularly when the government's budget accounting is murky. It also requires B to commit not to take advantage of situations in which A has lowered its guard. In practice, inability to commit seems likley to be a frequent situation.

[19] The appendix studies in detail the model under the following restrictions on the parameters: $(1-\Delta)\alpha < n$ and $\alpha \geq 2n - n^2$. Exploring other regions of the parameter space would not materially change the qualitative insights from the model.

[20] For example CP is the region of the parameter space where in equilibrium A plays C and B plays C. The lables $z^l_{B,PC}$, $z^l_{B,CC}$, etc. are explained in the online appendix.

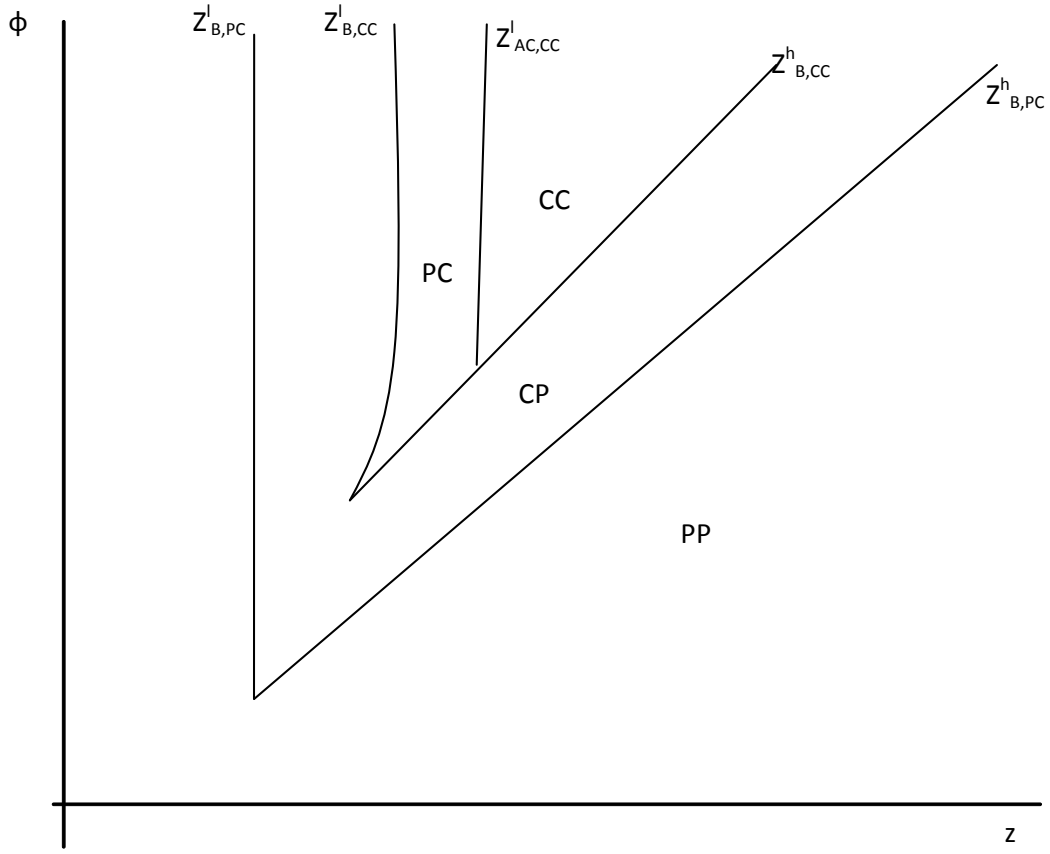


Figure 3: Regions of Peace, Exploitation, and Open Conflict

The only two regions that always exist (i.e. for all combinations of values of α, δ, Δ, y_A, y_B, and n) are PP and CC (we return to comparative statics with respect to these parameters below).

The intuition for how ethnic relations change with z is as follows. For z very low neither party wishes to disturb the peace, as the pie to fight over is too small. When z is larger both A and B become interested in exploiting each other, but not yet willing to engage in full-scale conflict, as the costs of the latter are still too large compared to the benefit. Hence, it is possible for A to play C without B fighting back. As z rises further, B begins to fight back when A plays C. Whether we enter directly the CC region, or we first transit through a PC region (as depicted in the figure), depends on parameter values. The reason why there may be a PC region is that, if z is not large enough, A may prefer to be

exploited rather than bear the very large costs of an open conflict. Further increases in z beyond the CC region can bring about a new region of exploitation of B by A. The intuition for this region is interesting. For z large enough, the entire B population passes into group A under exploitation, so the payoff of group B under exploitation becomes increasing in z. In particular, it can exceed the payoff of open conflict, leading the group as a whole to choose to be exploited rather than fight back. However in the same region B would respond to P with C, as it is attractive to exploit the other group. A is therefore faced with a choice between being exploited or exploit, and obviously chooses the latter, even if the benefit is nil. Finally, for z very large again neither group wishes to exploit the other, as the volume of passing (both ways) would nullify the benefits.

The model's comparative statics with respect to the income of the stronger group, y_A, are slightly richer than in the benchmark model of exploitation. As in that model, an increase in y_A makes group A generally more peace oriented, as it increases the cost of conflict (of any type). In particular, this results in a shift to the right of the lower bounds of both the CP and the CC region, meaning that the onset of conflict is generally for higher values of z. However, an increase in y_A also makes group A less mobile, thereby increasing the region in which B responds to P with C. As a consequence, A is forced more often to play C to preempt being exploited by B, resulting in shifts to the right also of the upper bounds of the CP and the CC region, meaning that conflict generally persists for higher values of z as well. Another effect is that the PC region widens. In sum, an increase in y_A leads to shifts to the right of both the inner and outer conflict triangles, as well as an expansion of the inner PC region.[21]

Similarly, increases in y_B tend to increase the cost of conflict for B, which generally tend to shrink the CC area. The one countervailing force comes about, once again, when B must choose between CC and a CP situation where all the members of B pass into A. Since an increase in y_B increases the cost of passing, the net effect may be that B chooses CC more often in this region. Increases in B also have the effect of moving the outer edge of the CP region inward: the reason is that the higher y_B implies that B does not try to exploit A as often. As a result, A is forced to preempt less often. Thus, contrary to the benchmark model, increases in y_B could shrink, rather than expand, the overall conflict area. On the whole, however, the insight is similar: increases in one group's income make that group less aggressive, and the other group more aggressive.

The effect of an increase in n on the overall conflict area is also more ambiguous than in the benchmark model. The main conflicting forces are that: A has less to gain from

[21] The parameter y_A, together with n, discussed below, is also the most important determinant of whether some of the regions exist at all. In particular, for y_A sufficiently small both the PC and the right corridor of the CP region disappear.

conflict, which is the only force in the benchmark model, but B has now more to gain from conflict. This reflects the asymmetric nature of conflict: it does not depend on the average gain from conflict between the two groups, but on the maximum gain between the two groups. The maximum gain occurs when a small minority exploits a large majority. In this case, very low values of n tend to be associated with exploitation of B by A, and extremely large values of n may be associated with exploitation of A by B. In between, we tend to have either peace, or open conflict. Hence, the model accommodates the frequent pattern of powerful minorities exploiting the weaker majority (e.g. Sunnis exploiting Shias in pre-war Iraq), but also the puzzle that sometimes what look like small and weak minorities enjoy a seemingly privileged status. In these cases the strong majority (group A) prefers to entirely acquiesce to group B's voracity. Perhaps the current treatment of the surviving "American-Indians" in the US, and the Indian Tribes' fierce policing of their ethnic boundaries against (what they consider to be) infiltrators, may resemble this situation.

Many of the results in this sub-section highlight an important tension: the larger the group, the greater its power, but the less its incentive to engage in exploitation. This result may explain why the persecution of minorities is often accompanied and fueled by accusations that the minority is conspiring against the majority. It is true that in open conflict the minority stand to obtain a relatively minor share of the country's resources, but it is also true that if the majority lowers its guard and opens itself to exploitation by the minority the latter has enormous incentives to seize the opportunity.

5 Empirical Evidence and Historical Examples

The goal of this section is to discuss the empirical plausibility of our model assumptions (briefly) and predictions (at greater length). We begin in Section 5.1 with a short review of evidence of passing behavior, as well as evidence that passing can be successful, in the sense that passers can fool members of the receiving group. Next, in Section 5.2, we confront our model's predictions for the effects of distance, resource endowments, group incomes and group sizes with the existing empirical literature on conflict. We find some comfort in this review, as the available evidence overall seems quite consistent with our model's predictions. However few of the existing contributions can be construed as direct tests of our model, as fully convincing measure of distance, our crucial conceptual construct, have not yet been developed. In additions, a proper test of some of our predictions would require non-monotonic specifications and group-level income data, while the literature so far has privileged liner models and used average income across all groups. For these reasons, the bulk of this section is taken up by Section 5.3, which complements the review of empirical literature with a number of case studies. The role of these examples is to illustrate how the concept of ethnic distance,

as well as other insights from the model, could potentially enhance our understanding of variations in ethnic relations across countries and over time.

5.1 Passing and Detection

At least since Barth's (1969) classic book social scientists have been aware of overwhelming evidence that individuals change their ethnic affiliation in response to external circumstances. An often-cited case of passing is represented by light-skinned African-Americans who "passed" and "lived on the other side" [to use the language of the New York Times, 9/7/2003], albeit at the cost of severing all ties with their families and childhood friends, as poignantly depicted in Roth (2000).[22] The porosity of ethnic boundaries is also evident in wide observed swings in self-reported ethnic identification in censuses [Nagel (1995), for American Indians, Evans et. al. (1993) for Aboriginal and Torres Strait Islanders, Lieberson and Waters (1993) for Whites in the U.S.]. Jeganathan (1997) reports that Tamil families living near Colombo give Sinhalese names to their children and teach them Sinhalese cultural practices to help them escape identification in case of riots. We will discuss several further examples of passing below.

A path breaking experimental study by Habyarimana et al. (2007) highlights the porosity of ethnic boundaries as well as the potential for individuals to manipulate their identity. The authors asked people from diverse ethnic groups in Uganda to view digital images of other Ugandans and categorize them into the appropriate ethnic group. They found that, for example, members of the largest ethnic group (the Baganda, which comprised about 45 percent of the survey), correctly identified a Bagandan approximately 70 percent of the time, and incorrectly identified a non-Bagandan as Bagandan approximately 20 percent of the time. They also found that, given the right incentives, members of some groups can send signals to members of other groups that fool them into mistakenly accepting them as members of their own. Lastly, they found that the degree of ethnic identifiability (or the ability to pass oneself off as a member of another ethnic group) varies across group pairs, indicating that some bilateral cleavages are more porous than others.

5.2 Empirics of Ethnic Conflict

Perhaps the most novel prediction of our theory is that ethnic conflict will be more prevalent the greater the distance among ethnic groups. Unfortunately systematic measures of ethnic distance are not available, and indeed the construction of a proper dataset would require repeating experiments such as the one in Habyarimana et al. (2007) in a large number of

[22] Joseph Roth is not the only novelist who saw the literary potentital of passing. Other examples include V.S. Naipaul (India), Edwidge Danticat (Haiti), and Uwem Akpam (Nigeria).

countries. However, building on work by Laitin (2000) and Fearon (2003), Desmet et al. (forthcoming) and Esteban et al. (2010) have recently made some progress using measures of linguistic distance. In particular, Desmet et al. (forthcoming) report that linguistic fractionalization computed on the basis of language groups that have split a long time ago is a significant predictor of conflict, while fractionalization among language groups that have split more recently does not predict conflict. This is consistent with our model, as the earlier in time two languages have split the more different they are likely to be. Hence, fractionalization based on earlier splits is a better measure of distance than fractionalization based on more recent splits: in other words older language cleavages likely correspond to higher language barriers that make assimilation and passing more arduous. Esteban et al. (2010) show that a measure of polarization constructed using linguistic distances is a robust predictor of conflict. While they interpret linguistic distance as proxying for differences in preferences, we think that an equally likely interpretation is that linguistic distance directly measures (a dimension of) the costs of passing among groups.[23]

As mentioned in Section 2, distance in space is another possible dimension of ethnic distance in the sense of our model. If groups are spatially clustered, jobs, subsidies, and other benefits of being the dominant group can be effectively targeted using geographic criteria - and practices of this kind are abundantly documented (see, e.g., the Bates papers mentioned in the literature review). Passing becomes correspondingly more costly, as it requires moving to a different region of the country. Hence, our theory also has the implication that geographically clustered and isolated ethnic groups are more likely to find themselves parties to conflicts. Matuszeski and Schneider (2006) present evidence that geographical clustering of ethnic groups is significantly related to the incidence, duration, and severity of civil war. Similarly, Cederman et al. (2009), Weidman (2009) and Weidman et al. (2010) find that groups that are more clustered, tend to live in mountainous areas (and are therefore more costly to reach/move away from), and are further away from the national capital are more likely to be in conflict with the central government [see also Toft (2003) for similar results].

Further progress on distance has also recently been made by Guiso, Sapienza, and Zingales (2009), and Spolaore and Wacziarg (2009), who find significant effects of "genetic distance" on international trade and per-capita income differences, respectively. While genetic distance is not the same thing as ethnic distance (most genetic differences do not lead to visible differences), this is consistent with distance being an important aspect of ethnic relations.

Our model also has comparative static implications with respect to appropriable

[23] It could also be that linguistic distance proxies for other types of distances, e.g. visible physical differences. This would still be consistent with our model.

wealth, z. Dube and Vargas (2011), Besley and Persson (2011), and Lei and Michaels (2011) find that increases in the price of locally-abundant natural resources and discoveries of new endowments foster conflict. These results are consistent with our model if on average localities are on the upward-sloping segment of the predicted inverted-U relation between resources and conflict.[24]

We have also derived some predictions with respect to changes in relative group incomes, y_A and y_B. Increases in the income of the losing/exploited group (which becomes more reluctant to pass) and declines in the income of the winning/dominant group (which becomes less concern with the opportunity cost of conflict) should increase conflict. Unfortunately the empirical literature has not heretofore investigated the effect of differential income shocks by ethnic group. In general, positive average income shocks appear to reduce conflict [Miguel et al. (2004), Ciccone (2011), Dube and Vargas (2011)]. This finding is consistent with our model if average income is more representative of the income of the dominant group, as would tend to be the case when the dominant group is the more numerous one.

A final set of predictions concerns initial relative group sizes, n, though these predictions are complex.[25] Much of the empirical literature on ethnic conflict is concerned with mapping different statistics from the size distribution of ethnic groups into probabilities of conflict [e.g. Fearon and Laitin (2003), Collier and Hoeffler (2004), Montalvo and Raynal-Querol (2005), Cederman and Girardin (2007)]. On the whole, this literature suggests that certain ethnic structures are more conducive to conflict than others, though the statistics used do not map easily into the predictions of the present model. The model does however highlight one possible concern with this literature. These studies take the existing ethnic structure of the population as exogenous. But our model predicts that relative group sizes change in response to conflict, so regressing conflict outcomes on statistics that depend on the size-distribution of groups is very close to getting the direction of causality wrong. The exogenous variable in our model is the *initial* group size distribution, but this is not what typical data sets measure.[26][27]

[24] Collier and Hoeffler (2004) find that the probability of conflict is inverted-U shaped in the fraction of primary commodities in GDP. This result is highly consistent with our predictions but it is not based on an empirical design suitable to identify causal effect. Furthermore Fearon (2005) shows that the result is not robust.

[25] In the baseline model of exploitation conflict is monotonically decreasing in the pre-conflict size of the strong group. However when the weaker group can also "fight back" the incidence of conflict may become U shaped in the stronger group's size.

[26] See Ahlerup and Olsson (2011) for another model of endogenous ethnic structure formation, and Fletcher and Iygun (2010) for empirical evidence that indeed ethnic structure is a function of past conflict outcomes.

[27] Rohner, Thoenig, and Zilibotti (2001b) show that feelings of ethnic identification and inter-ethnic hostility intensify following conflict. It is difficult to intepret this result without distinguishing between those in the group that came up on top or the group that lost ground in the conflict. For those in the successful group we

5.3 Historical Examples

5.3.1 Pigmentation

In the United States no other ethnic group stands out for its troubled relationships with the white majority (and other groups, for that matter), and for its persistently disadvantaged socioeconomic status, as the African-Americans. Our theory suggests this may in part be due to the fact that African-Americans are also the ones who most stand out visually: they are "black," as opposed to "white." Hence, the greatest amount of conflict is associated with the greatest ethnic distance, ϕ, as suggested by our theory.

Of course African-Americans come in different shades of black, so ϕ varies within this group as well. Consistent with our theory, an increasing body of work shows that light-skinned African-Americans have persistently (i.e. from the pre-civil war era to the present day) had better outcomes (nutrition, education, income, wealth) than darker-skinned ones [Bodenhorn and Ruebeck (2007) survey this literature]. In a striking recent contribution, Goldsmith et al. (2006) have shown that the light-skin premium is discontinuous: light-skin blacks have wages that are essentially the same as whites (controlling for the usual demographic characteristics), while medium and dark-skinned blacks have wages that are indistinguishable from each other and significantly below those of whites and light-skinned blacks. As the authors conclude, this suggests that << Employers ... in many cases, ... believe they are hiring someone who is just as white as they are themselves.>> (p. 245). Another striking finding by Gymah-Brempong and Price (2006) is that blacks with darker hues receive longer prison sentences than light-skin ones for the same crimes. A light-skin premium has also been documented for Mexican-Americans [Murguia and Telles (1996), Mason (2004)].[28]

The black-white conflict in America is particularly striking because there would have been no shortage of alternative (or additional) minorities to discriminate and exploit: Irish, Italians, Jews, Poles, and other migrant communities could have been equally attractive objects. Why haven't they been targeted in the way blacks have? According to our theory, this is simply because continued exclusion of these white immigrants would have been too costly to enforce given the close physical proximity, or low ϕ, with the Anglo elite. Had the

would definitely expect an intesification of ethnic identity as the returns from a clear ethnic identification have gone up. If there are still members of the losing group after the conflcit, these are by construction individuals who have failed to pass, and it is therefore not surprising that they will feel hostile to the other group.

[28] The other group that is both distant from the white majority and historically greatly exploited is of course the Native Americans. As argued in Section 4, our model can explain both their tragic experience in the 19th century, and their currently privileged status. Asians – another ethnically distant group – have also been singled out, witness for example the detention camps during World War II. But their "luck" was to arrive in the US mostly during the industrialization phase, when the incentives for exploitation had already declined considerably.

latter tried to perpetuate such discrimination, there would now be many more Americans with names like Coleman, and many fewer with names like Caselli, as the holder of the latter would have switched in mass to the former. Hence, the "Anglo" majority refrained from a systematic attempt to disenfranchise the white immigrants - who have therefore been able to preserve their ancestral identity.[29]

It is not that these immigrant communities did not suffer their own share of initial discrimination and exploitation, but that the "Anglos" have "backed off" fairly soon, say within one or two generations. One or two generations is probably the time required for the newcomers (i.e. their descendents) to learn the language well enough, and to overcome the physical baggage of pre-migration malnutrition, that they would be able to disguise their ancestry – if necessary. Of course in equilibrium this is not necessary. Also, it is not that it would have been impossible for the Anglos to set up a vast bureaucracy keeping track of everyone's ancestry, but in the case of physically similar individuals it was evidently too costly.[30]

It is now increasingly widely recognized that discrimination against blacks has been slowly but steadily declining over the last century in the US. Over the same span of time, the economy has undergone a huge structural transformation from largely agricultural to industrial and then service-based. This transformation has meant that land and other natural-resource rents have become an increasingly insignificant share of total income. In our model, this is equivalent to a decline in z/y. Hence, the model does indeed provide a possible interpretation for the gradual and ongoing phasing out of discrimination against blacks.

The South-African case presents of course many analogies with the US case, and our model describes it even better, if one identifies the dominant group as the one that has greater total resources. While whites are a numerical minority in South-Africa, their per-capita resources so dwarf those of the black majority that their "firepower" is greater. This allowed them to establish the apartheid regime. The rich mineral resources of the country, coupled with the small number of whites to divide them, provided the incentive. In other words South Africa has historically been a high ϕ, low n, and high z/y country, making it "ideally suited" for exploitation. Over time, as the economy grew and diversified away from the primary sector, and the sanction regime against the white government became increasingly aggressive, z/y fell, and the cost of maintaining the regime became too large

[29] Another distinguishing factor for blacks vis-a-vis other groups is that their ancestors came to the US as slaves. But it is not entirely clear why, after the abolition of slavery, people of anglosaxon descent would want to specifically target descendants of slaves (rather than descendandants of voluntary immigrants) for exploitation and discrimination. The evidence on light-skin premia discussed above also seem hard to reconcile with the view that blacks are differentially discriminated solely because of slavery.

[30] Imagine enforcing a policy of separate water fountains for Italian-Americans!

relative to the benefits.[31] The whites decided then to start a transition to the "no conflict" equilibrium. The model of Section 4 suggests that the nature of the apartheid regime may have changed from "by choice" to "preemptive" before further changes in the state variables made it safe enough for the whites to relinquish power.

One could keep going with examples of conflict or exploitation where differences in skin color plays a critical role in enabling members of one group to pinpoint members of the "other" group. The Dominican police openly uses skin complexion and texture as a criterion for identifying "Haitians" to be mass deported from the country.[32] Humphreys and ag Mohamed (2005) compare Southern Senegal and Northern Mali, and argue that in the former ethnic tensions are much less severe than in the latter – despite broadly similar socioeconomic conditions – because in Mali the minorities (Tuareg and Maures) are more readily physically distinguished from the majority than in Senegal (Diola).

5.3.2 Body size

The black-white gradient is of course an important physical source of ethnic distance, but by no means the only one. An illustration of this is provided by the Rwandan case, where so-called "Hutus" and "Tutsis" have been in extremely bloody – if somewhat intermittent – conflict since the end of the colonial era. Much has been written about the artificial birth of the Hutu-Tutsi split as part of the divide-and-conquer strategy of Belgium, the colonial power. For us, what is notable is the rich anecdotal evidence that physical attributes play a critical role in the conflict. On average, "Tutsis" are taller and more slender, they have somewhat lighter skin, and thinner noses. Indeed, the Belgian colonists classified a person as Tutsi if they had a long nose (or ten cows). During the genocidal campaign that led to the death of more than one half of a million people in 1994, "Hutus" reportedly made use of these visual cues to identify potential victims. This of course implies that many "Hutus" were also victimized, as they did not fit the stereotypical description (for example they were too tall or too thin). To us, the willingness of the genocide's perpetrators to commit such "type I" errors strongly supports the "group enforcing" interpretation of ethnic conflict over

[31] Mineral Sales as a fraction of GDP for South Africa declined from 25 percent in 1980 to 11 percent in 1994 (the end of apartheid).

[32] According to Human Rights Watch (2002) "the Dominican authorities have conducted mass expulsions of Haitians and Dominico-Haitians. ... Snatched off the street, dragged from their homes, or picked up from their workplaces, 'Haitian-looking' people are rarely given a fair opportunity to challenge their expulsion during these wholesale sweeps. Questioned by Human Rights Watch as to how undocumented Haitians are identified, the subdirector for Haitian affairs of the Dominican government's migration department insisted that they can be spotted ... Noting that Haitians also have 'rougher skin,' the subdirector declared that 'they're much blacker than we are. They're easy to recognize.' "

explanations based on hatred or within-group altruism.[33] To put it crudely, pre-genocide Rwanda was a country on the verge of an impending famine, mainly due to excess population pressure on the land. A genocide was one way to relieve such pressures, and targeting Tutsis, or rather – as it turned out – the tall and thin, assured that the designated victims could not infiltrate the dominant group (i.e., in this case, escape the killers).[34]

The use of height in the Rwandan case raises the interesting question of why is height not used more systematically around the world as a boundary-enforcing marker. In particular, it would seem that in ethnically-homogeneous countries one should observe winning groups of individuals below or above a certain height threshold. We speculate that the typical shape of the height distribution makes it unsuitable to the purpose of boundary enforcement. In particular, within ethnic groups (and gender) height distributions are known to be normal (and thus are unimodal and with thin tails). This implies that any group boundary that makes conflict worthwhile must be drawn at a point which leaves large masses of people on both of its sides. Because height is not easily measured perfectly, this means that the number of type I and type II errors is vast, and the scheme may become unworkable.[35]

5.3.3 Religion

Religion is often cited as a conflict-inducing cleavage, and indeed there appear to be some fairly clear-cut historical cases where religion appears to have played a major role. The effectiveness of religion as a signpost for group boundaries will mostly depend on the size of the psychic costs involved in conversion. In turn, such costs are likely to vary considerably across religions, across pairs of religions (namely conversion to religion A may be psychologically less costly than conversion into religion B, for someone originally raised in religion C), and across people of the same original group. Such variation can be tremendous. On the one hand, there are agents who are clearly willing to endure the utmost sacrifices to stay true

[33] The killers also targeted so-called "moderate Hutus," i.e. Hutus who did not cooperate in the genocide.

[34] The infamous Radio Mille Collines broadcast: "Those of you who live along the road, jump on the people with long noses, who are tall and slim, and want to dominate us." (Peterson, 2000, p. 327). Very similar considerations, only in reverse, apply to Burundi, where the tall and thin Tutsis dominate the Hutus. There, too, physical characteristics play an explicit role. For example, the army has a "height-by-girth" requirement that so happens to exclude from the ranks the average Hutu. And there, too, changing economic circumstances affect the incentive of the dominant group to tighten the exploitation equilibrium: when coffee prices (the export crop) fall, the relative return to government jobs increase, and the Tutsis fight Hutu "infiltration" more fiercely (Gurr, 2000).

[35] The (gender-specific) Rwandan height distribution is a mixture of the Tutsi distributuion and the Hutu distribution, which have different means. Hence it is conceivable that the resulting overall distribution is bimodal, and the valley between the two modes could conceivably be sufficiently deep such that drawing the boundary near the trough minimizes the number of type I and type II errors. It is also important to remember that height was only one of several physical markers used during the genocide.

to their religious identity (after all, the word "martyr" was originally introduced to describe people who were willing to be eaten alive by wild animals for their faith!). On the other, there is abundant anecdotal evidence which confirms that in at least some cases individuals are able and willing to shed their religion to respond to external circumstances, particularly discrimination against one's group. In post-Reform Europe entire populations switched back and forth between Catholicism and Protestantism, as the political alliances of their princes switched back and forth between the Pope, the Emperor, and other potentates.[36] In Fascist Italy many Jews converted to Catholicism to escape discrimination. In modern-day India it is common for lower-caste Hindus to convert to the Muslim or Catholic faiths, which are relatively less discriminated against.

In terms of our model, it is unlikely that we can ascribe the same value of ϕ to different religious-group pairings: some group pairs will perceive a high ϕ, leading to a higher likelihood of conflict, and others a lower ϕ, leading to broadly peaceful relations. It is therefore unlikely that religious differences will be found *systematically* to relate to conflict. Indeed, Alesina et al. (2003) find that religious fractionalization does not significantly predict the rent-seeking policy distortions usually associated to other types of ethnic fractionalization. Similarly, examining a large cross-section of conflicts, Fox (1997) finds that in only a small minority of these do religious issues play more than a marginal role.

Another implication of these considerations is that, while religion will sometimes be the focal trigger for discrimination, physical differences should be more systematically related to conflict than religious ones. A stark example of color working better than religion as a group enforcing mechanism is recounted by Horowitz (1985, p.43): "In seventeenth century North-America, the English were originally called 'Christians,' while the African slaves were described as 'heathens.' The initial differentiation of groups relied heavily on religion. After about 1680, however, a new dichotomy of 'whites' and 'blacks' supplanted the former Christian and heathen categories, for some slaves had become Christians. If reliance had continued to be placed mainly on religion, baptism could have been employed to escape from bondage. Color provided a barrier seemingly both 'visible and permanent.' " [37]

5.3.4 Language

Another feature that may be used to discriminate among groups is language. Examples of this go literally back to biblical times – with tales of warring tribes using the pronunciation of certain words to establish who should be slaughtered [Judges 12:4-6] – and stretch to 21st

[36] And the so-called "religious wars" were mostly international wars that happened to involve the Papacy as one of the territorial contenders.

[37] An argument could probably be made that a similar shift occurred at various times from religious to racial anti-Semitism, for example after the expulsion of Jews from Spain.

century Northern Ireland, where, as reported by *The Economist* of June 15th, 2002, "a group of masked men [entered a school and] demanded that students produce identification or repeat the alphabet. Many Catholics pronounce the letter "h" differently to Protestants, with an aspiration influenced by the Irish language. Students were evacuated before it became clear what was planned for people with the wrong accent." Another example is provided by the 1937 massacre of Haitians in the Dominican Republic, where victims were identified by their inability to pronounce the word *perejil* (parsley) "correctly" [e.g. Danticat (1998), who also highlights the occurrence of type I errors.]

5.3.5 No conflict

So far our examples have involved cases of conflict, and we have asked whether our model can shed light on these episodes. In principle, we would like to offer examples were there is no conflict because there is insufficient distance. A possible set of candidates is provided by those resource-rich countries that have managed to avoid some of the most pernicious political consequences of the windfall, such as Norway. Because of its rich oil reserves Norway is probably a high z/y for the purposes of our model. While most countries with a high share of natural resources in income seem to have fraught social relations and poor economic outcomes, Norway has neither. Perhaps its high degree of ethnic homogeneity is the key to this success. A similar example may be Botswana, where the physical similarity of different groups is cited by Acemoglu et al. (2003) as a possible reason why conflict over natural resources has not erupted there.[38] Such examples may be contrasted with, say, ethnically fragmented Nigeria or Congo.

A more subtle example of ethnic proximity leading to relatively peaceful ethnic relations may perhaps be found in the Indian case.[39] In a world were all ethnic cleavages are equally important, for a very poor, over-populated country such as India, the 13% Muslim minority should constitute an attractive target for massive exploitation, if not for Rwandan-style elimination. Instead, Muslims have for the most part equal economic and political rights. Our speculation is that India enjoys this relative harmony precisely because the ethnic distance

[38] The only shadow on Botswana's reputation as a model of ethnic harmony is cast by the advocacy group Survival International's claim that the government is mistreating the San, a tribe of Bushmen. Surprise surprise, the Pigmy-sized Bushmen have very high ϕ vis-a-vis other Southern Africans.

[39] There seemingly is a lot of communal violence in India, so some readers may find it paradoxical to treat India as a case of relative ethnic harmony. The fact, is, however, that *relative to the size of the population*, ethnic violence in India is actually fairly trivial. For example, Varshney (2002) estimates that between 1950 and 1995 there was a total of 7,173 deaths caused by communal rioting, which leads to an average of 155.9 deaths per year for those 46 years. In contrast, Pakistan seems to be engaged in repression of the Hindu minority. Although objective evidence is difficult to obtain, anecdotal evidence suggests that passing seems to be taking place, especially in the form of switching last names from Hindu to Muslim.

between Muslims and Hindus is quite modest: too oppressive an exploitation equilibrium by the Hindu majority would be unsustainable in the face of mass ethnic switching by the Muslims.

6 Conclusions

In this paper we have provided a simple theory of social distributive conflict which emphasizes the importance of the porosity of social-group boundaries. We have applied this theory to developed a new, simple explanation for the salience of ethnicity in exploitation and conflict around the world. Ethnicity provides a technology for group membership and exclusion which is used to avoid indiscriminate access to the spoils of conflict. Without such a technology groups become porous and the spoils of conflict are dissipated. In relating the incidence of ethnic conflict to variables such as group size and the share of expropriable assets in overall wealth, we were able to derive various implications that seem to shed light on a variety of historical episodes of conflict (and lack thereof).

It is natural to try to use the insights of the model to suggest policy recommendations to minimize the incidence of conflict along ethnic lines. The model suggests that economic development alone will remove the incentives for ethnic conflict, particularly if it is accompanied, as it often is, by a structural transformation where control over natural (expropriable) resources plays a smaller and smaller role The paper therefore adds to the list of good things that come with growth, beyond higher consumption. It also offers a foundation for the assertion by Habyarimana, et. al., (2008) that "modernization may be the antidote to ethnic nationalism rather than its cause."

Secondly, the model of Section 4 suggests that ethnic conflict is sometimes preemptive, in that the stronger group preempts with conflict to protect itself from aggression by a smaller group. If the smaller group could commit to no conflict, then the larger group would feel no need for preemption. This is certainly not a paper about how to form institutions that facilitate commitment, but it highlights the role of such institutions in avoiding conflict.[40]

Perhaps most interestingly, the paper suggests that any policy that blurs sharp distinction between groups will reduce the incidence of ethnic conflict. One such policy is the promotion of intermarriage. Policies such as tax breaks for interracial couples (which may increase with the number of children) and affirmative action programs for mixed-race indi-

[40] Policies that increase transparency on the magnitude and destination of natural-resource export revenues, such as the Extractive Industries Development Initiative (EITI), in which participating governments and oil companies agree to disseminate detailed information on quantities extracted, revenues, and royalties paid to the government, also find support in our model. Likewise for certification processes that keep conflict diamonds out of rich-country markets, as was done for the fighting in Sierra Leone.

viduals may help achieve such a goal. Policies to encourage interracial adoption could also be justified along the lines of our model. The surest path to a world without racism is a world without races.

Although we presented several historical examples of ethnic conflict that are consistent with the premise of this paper, there is a clear sense in which the data required to fully test the implications of the model are not yet available. Our theory highlights the role of ethnic "distance" in leading to ethnic conflict: ceteris paribus, ethnic groups are more likely to clash the more pronounced the differences that mark the ethnic cleavage. Systematic data on ethnic distance has not yet been collected. Extending the empirical results of Habyarimana, et. al. (2007) for Uganda to many other countries would be a great start in this direction. Given the importance of ethnic conflict in the world, we hope that research such as ours would motivate the collection of this type of data.

7 References

Acemoglu, Daron; Simon Johnson and James Robinson (2003): "An African Success Story: Botswana,", in Dani Rodrik (ed.), *In Search of Prosperity: Analytic Narratives on Economic Growth*, Princeton; Princeton University Press.

Ahlerup, Pelle and Ola Olsson (2011): "The Roots of Ethnic Diversity," working paper, University of Gothenburg.

Alesina, Alberto; Devleeschauwer, Arnaud; Wacziarg, Romain; Easterly, William, and Sergio Kurlat (2003): "Fractionalization," *Journal of Economic Growth*, vol. 8, no. 2, June, pp. 155-194..

Anderson, B. (1983): *Imagined Communities*, Verso, London.

Bates, Robert H. (1974): "Ethnic Competition and Modernization in Contemporary Africa." *Comparative Political Studies* (January).

Bates, Robert H. (1982): "Modernization, Ethnic Competition, and the Rationality of Politics in Contemporary Africa," in *State versus Ethnic Claims: African Policy Dilemmas*, Donald Rothchild and Victor A. Olunsorola (eds.), Boulder, CO: Westview Press.

Barth, Fredrik (1969): *Ethnic groups and Boundaries*, Universitetforlaget.

Besley and Persson (2011): "The Logic of Political Violence," *Quarterly Journal of Economics*, forthcoming.

Berman, Eli (2000): "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews," *Quarterly Journal of Economics*, 115(3).

Berman, Eli (2009): *Radical, Religious and Violent: The New Economics of Terrorism.* MIT Press

Berman, Eli and David D. Laitin (2008): "Religion, Terrorism and Public Goods: Testing the Club Model," *Journal of Public Economics*, 92, 942-1967.

Bodenhorn, Howard, and Christopher S. Ruebeck (2007): "Colorism and African-American Wealth: Evidence from the Ninetheenth Century South," *Journal of Population Economics*, 20(3) 599-620.

Cederman, Lars-Erik, and Luc Girardin (2007): "Beyond Fractionalization: Mapping Ethnicity into Nationalist Insurgencies," *American Political Science Review*, 101, 1, 173-185.

Cederman, Lars-Erik, Halvard Buhaug, and Jan Ketil Rod (2009): "Ethno-Nationalist Dyads and Civil War: A GIS-Based Analysis," *Journal of Conflict Resolution*, 53, 4, 496-525.

Chandra, Kanchan (2004): *Why Ethnic Parties Succeed: Patronage and Ethnic Headcounts in India*, Cambridge University Press

Ciccone (2011): "Economic Shocks and Civil Conflict: A Comment," *American Economic Journal: Applied Economics*, forthcoming.

Collier, Paul. and Anke Hoeffler (2004): "Greed and Grievance in Civil War," *Oxford Eco-*

nomic Papers, 56, 563-595.

Danticat, Edwige (1998): *The Farming of Bones*, Penguin Books.

Desmet, Klaus, Ignacia Ortuno-Ortin, and Romain Wacziarg (forthcoming), "The Political Economy of Linguistic Cleavages," *Jorunal of Development Economics*.

Dube, Oeindrila, and Juan Vargas (2011): "Commodity Price Shocks and Civil Conflict: Evidence from Colombia," unpublished, New York University.

The Economist (2002): "How do you pronounce hate?" 15 June, 56.

Esman, Milton (1994): *Ethnic Politics*, Cornell University Press.

Esteban, Joan-María, and Debraj Ray (1994): "On the Measurement of Polarization," *Econometrica*, 62(4), 819-851.

Esteban, Joan and Debraj Ray (1999): "Conflict and Distribution," *Journal of Economic Theory*, 87, 379-415.

Esteban, Joan and Debraj Ray (2008). "On the Salience of Ethnic Conflict." *American Economic Review*, 98(5): 21852202.

Esteban, Joan and Debraj Ray (2011). "A Model of Ethnic Conict." *Journal of the European Economic Association*.

Esteban, Joan and Debraj Ray (forthcoming). "Linking Conflict to Inequality and Polarization." *American Economic Review*.

Esteban, Joan, Laura Mayoral and Debraj Ray (2010). "Ethnicity and Conflict: An Empirical Study," working paper, Institut d'Analisi Economica.

Evans, Julie, Dietmar Kahles and Catriona Bate (1993): "1991 Census Data Quality: Aboriginal and Torres Straight Islander Countes," Australian Bureau of Statistics, Population Census Evaluation, Census Working Paper 93/6.

Fearon, James (2003): "Ethnic Structure and Cultural Diversity by Country," *Journal of Economic Growth*, 8, 2, 195-222.

Fearon, James (2005): "Primary Commodity Exports and Civil War," *Journal of Conflict Resolution*, 49, 4, 483-507.

Fearon, James (1999): "Why Ethnic Politics and "Pork" Tend to Go Together," unpublished, Stanford University.

Fearon, James and David Laitin (2000): "Violence and the Social Construction of Ethnic Identity," *International Organization,* 54, 4, Autumn, 845-877.

Fearon, James and David Laitin (2003): "Ethnicity, Insurgency, and Civil War, *American Political Science Review,* 91, 1, February, 75-90.

Fletcher, Erin and Murat Iygun (2010): "The Clash of Civilizations: A Cliometric Investigation," working paper, University of Colorado.

Fox, Jonathan (1997): "The Salience of Religious Issues in Ethnic Conflicts: A Large-N

Study," *Nationalism & Ethnic Politics,* 3, 3, Autumn, 1-19.

Goldsmith, Arthur H., Darrick Hamilton, and William Darity Jr. (2006): "Shades of Discrimination: Skin Tone and Wages," *American Economic review*, 96 (2), 242-45.

Guiso, Luigi, Paola Sapienza and Luigi Zingales (2009): "Cultural Bis in Economic Exchange," *Quarterly Journal of Economics*, 124(3), 1095-1131, August.

Gurr, Ted Robert (2000): *Peoples Versus States: Minorities at Risk in the New Century*, United States Institute of Peace.

Gymah-Brempong, Kwabena, and Gregory N. Price (2006): "Crime and Punishment: And Skin Hue Too?" *American Economic review*, 96 (2), 246-50.

Gurr, Ted Robert (2000): *Peoples Versus States: Minorities at Risk in the New Century*, United States Institute of Peace.

Habyarimana, James, Macartan Humphreys, Daniel N. Posner, and Jeremy M. Weinstein (2007): "Placing and Passing: Evidence from Uganda on Ethnic Identification and Ethnic Deception," unpublished, Georgetown University.

Habyarimana, James, Macartan Humphreys, Daniel N. Posner, Jeremy M. Weinstein, Richard Rosecrance, Arthur Stein, and Jerry Z. Muller (2008): "Is Ethnic Conflict Inevitable?," *Foreign Affairs*, July/August.

Horowitz, Donald L. (1985): *Ethnic Groups in Conflict.* Berkeley, CA: University of California Press.

Humphreys, Macartan and Habaye ag Mohamed (2005): "Senegal and Mali: A Comparative Study of Rebellions in West Africa" in Collier and Sambanis (eds.) *Understanding Civil War Africa: Africa Evidence And Analysis.*

Human Rights Watch (2002): *Dominican Republic*, available at http://www.hrw.org/reports/2002/domrep/index.html.

Jeganathan, Pradeep (1997): *After a Riot: Anthropological Locations of Violence in an Urban Sri Lankan Community.* PhD dissertation, University of Chicago.

Laitin, D. (2000). "What is a language community?" *American Journal of Political Science*, 44, 142–54.

Lei, Yu-Hsiang, and Guy Michaels (2011): "Do Giant Oilfield Discoveries Fuel Internal Armed Conflicts?" unpublished, LSE.

Lieberson, Stanley and Mary Waters (1993): "The Ethnic Responses of Whites: What Causes Their Instability, Simplification, and Inconsistency?" *Social Forces*, 72(2), December, 421-450.

Mason, Patrick L. (2004): "Annual Income, Hourly Wages, and Identity Formation among Mexican Americans and other Latinos," *Industrial Relations*, 43, 4, 817–834, October.

Matuszeski, Janina and Frank Schneider (2006): "Patterns of Ethnic Group Segregation and

Civil Conflict," unpublished, Harvard University.

Miguel, Edward, Shankar Satyanath, and Ernest Sergenti (2004): "Shocks and Civil Conflict: An Instrumental Variable Approach," *Journal of Political Economy*, 112(4), 725-753.

Murguia, Edward and Edward E. Telles (1996): "Phenotype and Schooling among Mexican Americans," *Sociology of Education*, 69(4), 276-289

Montalvo, Jose G. and Marta Reynald-Querol (2005): "Ethnic Polarization, Potential Conflict, and Civil Wars," *American Economic Review*.

Nagel, Joane (1995): "American Indian Ethnic Renewal: Politics and the Resurgence of Identity," *American Sociological Review*, 60, 947-965.

Posner, Daniel N. (2005): *Institutions and Ethnic Politics in Africa*, Cambridge University Press, New York.

Robinson, James A. (2001): "Social Identity, Inequality, and Conflict," *Economic of Governance*, 2, 85-99.

Rohner, Dominic (2010): "Reputation, Group Structure, and Social Tensions," *Journal of Development Economics*.

Rohner, Thoenig and Zilibotti (2011a): "War Signals: A Theory of Trade, Trust and Con‡ict," working paper, University of Zurich.

Rohner, Thoenig and Zilibotti (2011b): "Seeds of Distrust: Conflict in Uganda". CEPR Discussion Paper No. 8741.

Roth, Philip (2000): *The Human Stain*.

Spolaore, Enrico, and Romain Wacziarg (2009): "The Diffusion of Development," *Quarterly Journal of Economics*, 124(2), pp. 469-530.

Toft, Monica Duffy (2003): *The Geography of Ethnic Violence: Identity, Interests, and the Indivisibility of Territory*, Princeton University Press.

van den Berghe (1978): "Race and Ethnicity: A Sociobiological Perspective," *Ethnic and Racial Studies*, 1, 4, 401-11.

van den Berghe (1981): *The Ethnic Phenomenon*, Elsevier.

van den Berghe (1995): "Does Race Matter?" *Nations and Nationalism*, 1 (3), 357-88.

Varshney, Ashutosh (2002): *Ethnic Conflict and Civil Life*, Yale University Press.

Weidman, Nils B. (2009): "Geography as a Motivation and Opportunity: Group Concentration and Ethnic Conflict," *Journal of Conflict Resolution*, 53 (4): 526-543.

Weidman, Nils B., Jan Ketil Rod (2010): "Representing Ethnic Groups in Space: A New dataset," *Journal of Peace Research*, 47 (4), 491-99.