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Implications of ethnic diversity

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Summary

Ethnically differentiated societies are often regarded as dysfunctional, with poor economic performance and a high risk of violent civil conflict. I argue that this is not well-founded. I distinguish between *dominance*, in which one group constitutes a majority, and *fractionalisation*, in which there are many small groups. In terms of overall economic performance, I show that both theoretically and empirically, fractionalisation is normally unproblematic in democracies, although it can be damaging in dictatorships. Fractionalised societies have worse public sector performance, but this is offset by better private sector performance. Societies characterised by dominance are in principle likely to have worse economic performance, but empirically the effect is weak. In terms of the risk of civil war, I show that both theoretically and empirically fractionalisation actually makes societies safer, while dominance increases the risk of conflict. A policy implication is that fractionalised societies are viable and secession should be discouraged.

1. INTRODUCTION

Nation-building has been seen as the decline of ethnic or local loyalties and their replacement by allegiance to a nation. The new states of the developing world have often yet to go through this process: people identify more strongly with their kin group, ethnic group, or religious group, than with the nation. The power of such sub-national identities is commonly regarded as a curse. Societies divided by ethnicity are seen as less likely to reach co-operative solutions, and more likely to victimise minorities.

The most serious charge levelled against ethnic differentiation is that it is the prime cause of violent civil conflict. The evidence seems to bear this out. The developing countries are more ethnically diverse than the OECD societies, and they suffer a much higher incidence of civil war. Among developing countries, Africa is more ethnically diverse than other regions and it has the highest incidence of civil war, a phenomenon often interpreted as the post-colonial re-emergence of ancestral ethnic hatreds. Ethnic conflicts in developing countries have become a major policy concern to OECD governments, triggering both humanitarian and military interventions. In addition to the massive military and financial interventions in the former Yugoslavia, during the 1990s Belgium, Britain, France and the USA all dispatched troops to African conflicts. Such policy interventions were partly motivated by the manifestly debilitating consequences of civil war for the society in which it occurs. However, there was probably also an element of self-interest. Civil wars have social repercussions far beyond the boundaries of the affected state. Refugees create waves of migration, and the diasporas are often drawn in to the conflict. Indeed, many civil wars have a penumbra of illegal migration and drug trafficking which directly affect OECD societies.

Ethnic differentiation has also come to be seen as detrimental to economic management. Easterly and Levine (1997) report that ethnic diversity reduces the rate of economic growth. They explain this in terms of a hypothesised effect of diversity upon political choices. Diverse societies are alleged to find it more difficult to reach co-operative solutions, and to be more likely to waste resources in distributional struggles. The economic consequences of this allegedly dysfunctional politics are claimed to be huge. Easterly and Levine attribute Africa's present poverty predominantly to its

unusually high ethnic diversity. The title of their article `Africa's growth tragedy: Policies and Ethnic Divisions' aptly summarises the proposition: ethnic divisions are responsible for economic policies which are so impoverishing as to be tragic. As with civil war, impoverishment casts a long shadow: OECD governments attempt to remedy it through aid programs, motivated both by compassion and by fear of the social and political consequences of bordering on regions of extreme poverty.

These two detrimental effects of ethnic differentiation can be nested. Civil war can be viewed as the extreme manifestation of the more general phenomenon of dysfunctional politics. The underlying propositions are that ethnic divisions make co-operation more difficult and victimisation more likely.

If strong sub-national ethnic identification is indeed dysfunctional, then there appear to be two solutions. Governments could engage in the sort of virulent nationalism which Europe used in its own building of national identities. The obvious danger in this process is that it risks international conflict, as happened in Europe. Alternatively, governments could accede to the demand for ethnic self-determination, creating many new states. This solution gained momentum during the 1990s although it has some evident limitations. In this paper I argue that neither of these solutions is necessary because the premises on which they are based are false. With a few specific exceptions, ethnic diversity neither increases the risk of civil war, nor reduces economic growth. Multi-ethnic societies can usually be socially and economically fully viable.

In Section 2 I set out the current state of knowledge: what is meant by ethnic identity, and why is it thought to be dysfunctional? In Sections 3 and 4 I venture beyond the literature. In Section 3 I investigate how ethnic politics might affect economic performance, deriving predictions from theories of political choice and testing them on global data. In Section 4 I turn to the causes of large scale violence. I investigate how ethnic differentiation might effect civil conflict. Building on new theories of conflict which stress the importance of the budget constraint faced by the rebel organisation, I test three predictions on global data. In Section 5 I draw out some implications for policy. Ethnic diversity is not `guilty as charged'. It does not, usually, cause slower growth, and it does not, usually, cause civil war. The international community may need to rethink its current tolerant approach to secession.

2. WHAT DO WE KNOW AND WHAT ARE THE GAPS?

How does ethnicity sometimes come to be the basis for social and political identity?

Ethnicity as a basis for identity is a social rather than a physiological phenomenon. As a *cultural* phenomenon ethnicity is nevertheless, highly persistent: people chose to pass on their culture by marrying within their own group (Bisin and Verdier, 2000). However, as a *political* phenomenon, ethnic identity is considerably more fluid. This is indeed implied by `national building' – in Europe perceptions of identity changed during the eighteenth and nineteenth century from being (say) Scottish or Breton to being British or French. The process is recounted for eighteenth century Britain in *Britons: Forging the Nation* (Colley, 1992), and for nineteenth century France in *Peasants into Frenchmen* (Weber, 1975). Currently, in much of the developing world the most powerful levels of social identity are neither the nation nor the region, but the kin group and the tribe. One of the developments in New Institutional Economics has been to reinterpret kin groups not as primitive emotional bonds but as efficient responses to problems of information and contract enforcement in traditional economies. Posner (1980) brilliantly shows why kinship was (and remains) such an efficient basis for collective action. Basing group membership upon kinship provides clear rules of lifetime membership, thereby overcoming the standard problems of adverse selection. Kinship also provides high observability of behaviour: the involvement and gossip of relatives ensures that the group is well-informed about anti-social behaviour, and this discourages moral hazard. Kin groups are thus well-placed both to enforce bilateral contracts among members, and to provide group-level insurance or defence, anchored on a robust web of reciprocal obligations. The value of kin groups applies in a variety of contexts: Posner's original application was to high-risk agriculture, but Greif (1992) shows their value in medieval long distance trade, and Biggs *et al*. (1996) show their value in manufacturing. On this view, kin groups are efficient responses to the information and contract enforcement problems of market economies. An implication is that a society composed of multiple kin groups is more efficient than a homogenous, but atomised, society. Kin

groups do not divide a pre-existing whole, but rather aggregate an atomised society into groups large enough to reap the gains from collective action.

While the basis of social identity in developing countries may usually be the kin group, effective political groupings are too large to be based upon social interaction, and so must be based upon an *imagined* shared identity (Anderson, 1983). Where collective action is already based upon ties of blood as in kin groups, it is easy to conjure up imagined larger blood-related political groupings. For example, in Africa the advent of colonialism created opportunities for large political groupings to secure economic advantages. Kin groups `invented tradition' as they amalgamated into large tribes, although in practice language seems to have been the main basis for tribal agglomeration. The three main tribal groupings in Nigeria (Yoruba, Ibo and Hausa-Fulani) appear to date from the nineteenth century, while the currently dominant Kenyan tribe, the Kalenjin, dates back only to the 1940s. This process of amalgamation is continuing. Daniel Posner (1999) shows how African tribes have formed durable political alliances, so that societies are considerably less fractionalised politically than implied by tribal identity. Modern ethnic political loyalties thus start from reciprocal economic obligations within a kin-group, extend to an imagined community of shared interest within a tribe, and often extend to alliances with other tribes to form a political party.

Given that in many societies ethnicity, real or imagined, is the basis for social and political identity, what are its consequences?

To research these issues empirically, social scientists need a quantitative measure of how societies differ with respect to the extent of ethnic differentiation. The most widely used measure is the `index of ethno-linguistic fractionalisation' (ELF). Homogenous societies are scored zero, and the theoretical maximum of 100 would be reached if each person belonged to a distinct group. The observed range is from zero to 93. This measure has some serious problems. Daniel Posner (1999) describes some substantial inaccuracies. Further, representation by a single number can lose critical information. We might expect that victimisation arises in societies in which one or more minorities face a majority, while an inability to co-operate arises in societies in which there are many groups, none with a majority, yet the ELF index cannot distinguish between them. I term these two circumstances *dominance* and *fragmentation* and I will

show below that they have significantly different consequences. Examples of societies with ethnic politics in which there is a majority ethnic group and one or more ethnic minorities are Malaysia, Belgium, Northern Ireland, Canada, South Africa and Rwanda. In these societies the fear of ethnic politics is that it will lead to the permanent exclusion of other groups and discrimination against them. However, most societies are characterised neither by ethnic dominance nor by homogeneity, but by fragmentation.

A recent literature suggests that kin groups may also create substantial problems of co-operation between members of different groups. I consider four studies in ascending order of size and complexity of organisation. Miguel (1999) studies school boards in different areas of Kenya. He shows that to function effectively, the boards need to be able to enforce obligations within the community, for example, the duty to make financial contributions to the school. He finds that those boards which are ethnically diverse are less able to do this, since board members are less willing to criticize someone from their own ethnic group in front of members from other groups. Alesina *et al*. (1999) investigate a larger type of community and a more general decision, namely city government in the USA. They find that the more ethnically diverse is the electorate, the worse is the productivity of public expenditure. They suggest that diversity increases the problems of collective action because more of the benefits are external to the group. Together with Ashish Garg, I analyzed the effect of ethnic diversity in the Ghanaian labour market (Collier and Garg, 1999). We also found that ethnic diversity had consequences which must have been highly problematic. Controlling for other characteristics, workers from whichever tribe was locally the largest were commanding a substantial wage premium. We explained this in terms of the power of kin group patronage in promotions, with larger groups having disproportionate power. The highest level of organisation and generality of decision is that analysed by Easterly and Levine (1997). Here the adverse consequence is on the national growth rate, and the inferred mechanism is poor national economic policy. Easterly and Levine infer that ethnic diversity makes political co-operation more difficult. Thus, at various sizes of organisation, ethnic diversity appears to make co-operation more difficult.

However, there is also counter-evidence. Although Miguel convincingly establishes why ethnic diversity is dysfunctional within a Kenyan school board, the

explanation cannot account for the other examples of the costs of diversity. In the school boards diversity nullifies the co-operation which can otherwise be achieved by kin groups. Diversity only takes the society back to the non-cooperative outcome of atomistic homogeneity. Obviously this cannot be the explanation for Easterly and Levine's result that ethnically diverse societies grow less rapidly than ethnically homogenous societies. It turns out that the ethnically diversity of cities analysed by Alesina *et al.* are characterised by dominance, not fragmentation. Thus, the costs of diversity which they find might only occur in conditions of dominance. If so, this would be an important qualification since, unlike US cities, most ethnically diverse countries are characterised by fragmentation rather than dominance. My own study with Garg distinguished between the public sector and the private sector. We found that in the public sector the patronage-induced wage premium for the locally largest tribe was 25% whereas in the private sector it was zero. We interpreted this as suggesting that in the private sector competition forced firms to curb the patronage power of kin groups, so that ethnic diversity was only a problem for public sector organisations. Recall that both the Miguel and Alesina et al. studies were of public sector organisations. Easterly and Levine simply use the ELF score as a measure of ethnic diversity and do not distinguish between dominance and fragmentation so that again, potentially, all the costs of diversity could be due to dominance. Further, as argued by Arcand *et al.* (2000), if the adverse effect of ethnic diversity works through poor policy choice, then once policy choices are added to the Easterly and Levine growth regression, the negative coefficient upon ethnic diversity should diminish. They add a range of macroeconomic policies to the regression and show that the coefficient on ethnic diversity does not diminish. Thus, rather than amounting to a unified critique of ethnic diversity, the literature may simply show that it can have negative effects in particular circumstances. Perhaps ethnic diversity is damaging if it takes the form of dominance; perhaps it is damaging in the public sector. A more nuanced analysis seems to be required.

Another literature considers an altogether darker supposed consequence of ethnic diversity, not as an impediment to co-operation, but as an incitement to victimisation and civil war. Horowitz (1985) shows that ethnic identity is often accompanied by hostility to other groups. The problem of victimisation of minorities, such as Jews in Europe and the

Tutsi in Rwanda, has been extensively analysed, most notably through the `Minorities at Risk' project (Gurr, 1993). Emminghaus et al. (1998) conclude that `the formation of cultural identities about primordial sentiments without the parallel or subsequent development of civil identities has led to primordial violence in today's world' (p.140). However, both political science and economics has countervailing theories which argue that ethnic hatred does not provide a good explanation for large-scale violent conflict. Two distinguished political scientists, Fearon and Laitin (1999), analyse the Minorities at Risk data and roundly reject both cultural differences and the degree of cultural and economic discrimination against minorities as explanations for episodes of major violence. Similarly, Bates (1999) finds that while political *protest* is more common in ethnically diverse societies, political *violence* is less common. He concludes, `it is diversity, not homogeneity that lowers the risk of conflict' (p.31). Economists have also developed a countervailing theory of civil war. Starting with the pioneering work of Grossman (1991), they have focused upon the budget constraint for rebellion: trying to identify the circumstances in which rebellion is financially profitable. In Grossman's work the very rationale for rebellion is financial: rebels are indistinguishable from criminal bandits. More recently, in my own work (Collier, 2000, 2000a), the motivation for rebellion is allowed to be more general, but financial and military viability are treated as important constraints. The core of the analysis is the differential ability of rebel organisations to raise finance, depending upon the opportunities for predation of primary commodity exports and for the taxation of diasporas. The predicted effects of ethnic diversity depend upon whether it takes the form of dominance or fragmentation. Dominance (one ethnic group in a permanent majority) may well produce victimisation and so increase the risk of rebellion. Fragmentation, however, is predicted to make rebellion more difficult because to be militarily viable a rebel organisation must maintain cohesion. If diversity reduces organisational cohesion, rebel recruitment is more problematic in diverse societies. Thus, in diverse societies, even if people hate each other more than in homogenous societies, they are less able to translate hatred into large-scale organised violence. Here, the `ethnic hatred' and economic theories of the causes of conflict radically diverge in a testable way. My empirical work with Anke Hoeffler (Collier and Hoeffler, 1998, 2000), attempts to test these rival theories on a

comprehensive data set of civil wars between 1960-99. We find that whereas ethnic dominance indeed doubles the risk of civil war, fragmentation significantly *reduces* the risk. Thus, as with the literature on ethnic diversity and co-operation, the case against diversity is less robust and less general than might appear at first sight.

3. DOES ETHNIC DIVERSITY CAUSE DYSFUNCTIONAL POLITICS?

If democratic politics is dysfunctional in ethnically diverse societies, then an implication might be that ethnically diverse societies need a strong leader `above' politics to avoid these pressures. This argument is beloved of third world dictators: their ethnically diverse societies need them.

I now compare the effect of ethnic politics in democracy and dictatorship. This requires a counterfactual, how political choices are made in the absence of ethnic loyalties. Unsurprisingly, modern theories of political choice seldom yield unambiguous predictions. Even something as basic as the relative efficacy of dictatorship and democracy turns out to be *a priori* ambiguous, a result which is consistent with the empirical literature. My argument will be that usually the introduction of party loyalties based on ethnicity does not substantially change outcomes, but that in two specific circumstances it is likely to have significant negative effects.

3.1. Ethnic diversity in democracies

I begin with the effect of ethnic parties in democracies. To analyse the democratic political process, it is useful to contrast two commonly used approaches to legislative decision-taking. One is the process originally analysed by Downs (1957), in which voter preferences are distributed only over a single issue, such as the rate of taxation, so that these preferences can be arrayed along a left-right spectrum. In the second, voters have preferences over multiple issues. Potentially, ethnic politics can take place within either of these systems.

3.1.1 Single-issue politics. Single-issue politics is a good point of embarkation. I will assume that the government is constrained so that all electors must benefit equally from

the provision of a public good financed out of taxation: so that the single issue is to choose the rate of taxation. Electors have different preferences because they differ by income: high-income voters will prefer a low income tax rate, and low-income voters will prefer a high income tax rate.

In the absence of identity politics, Down's model produces a clear result. Parties compete to form a minimum winning coalition, and the winner is the party which attracts the support of the median voter. Thus, the tax rate will be set at that rate preferred by someone with median income (although this need not be socially optimal). Now introduce ethnic politics: each ethnic group has its own political party, supported by all members of the group. What happens depends upon whether income differences are related to ethnic differences. First, suppose that the two are unrelated: the distribution of income is the same for each ethnic group. In this case, ethnic politics does not change the median voter outcome, although the process by which democracy reaches the tax rate decision is different. With ethnic politics the important democratic process is that which is internal to each party. Regardless of which ethnic party is in power, with internal democracy each party will represent the median voter within its ethnic group. By assumption, all of these median voters have the same interests. Hence, ethnic politics makes no difference to political decisions regardless of whether diversity takes the form of fragmentation or dominance.

Now consider the other extreme, where incomes differ so much between ethnic groups that all the members of the richest group are richer than all the members of the next group, and so on (income is `lexicographic' in ethnicity). That ethnic party which contains the voter with the median economic interest now becomes the pivotal party, able to determine the government. However, this pivotal ethnic party need not maximise the well-being of the voter with the median economic interest. This voter is already locked into supporting the party by virtue of his or her ethnic identity. Hence, if the party is internally democratic, it will be driven to maximising the well-being of the voter who is at the median of the party rather than at the median of the electorate as a whole. Whether this difference is important depends upon the nature of ethnic diversity. If there is fragmentation then the median voter within the pivotal party is likely to have interests very close to those of the median elector. If, however, there is ethnic dominance then the

divergence may be greater. Consider, for example, a stylised version of South African politics in which the black party holds 65% of the vote, with whites and Asians having higher incomes than blacks. Now, ethnic politics delivers policies which maximise the well-being of the 33rd percentile as opposed to the 50th percentile with ethnicity-free politics. However, paradoxically, as ethnic dominance increases, the divergence diminishes. If the dominant ethnic group has 90% of the electorate, then its party maximises the interest of around the 46th percentile.

To summarise, in single-issue politics ethnic politics is scarcely alarming. If ethnic identities are unrelated to economic interests ethnic politics has no effect. Even when ethnic identity is strongly correlated with economic interest, ethnic politics makes surprisingly little difference. When diversity takes the form of fragmentation ethnic politics will normally have only a negligible effect. When it takes the form of ethnic dominance, it will only have a substantial effect if the dominant group has a small plurality, and if, at the same time, there is a large difference between the income of this group and other groups.

3.1.2. Multi-issue politics. Single-issue politics is not, however, a very illuminating window on the political process. Now consider an extreme form of multi-issue politics, namely, the distribution of expenditure. Instead of the good financed out of taxation being a public good which benefits all electors equally, suppose that it benefits only the electors of the constituency in which it is located. Further, suppose that the taxation needed to finance it has disincentive effects and so reduces the growth rate of the economy. The higher is public expenditure, the lower is growth. The political process must now decide on the pattern of public expenditure bearing in mind the resulting taxation. In the absence of identity politics, political parties (if they exist at all), will be weak. Legislators depend for their survival on their ability to deliver expenditure to local voters, rather than on party loyalties. In general, games such as this have no `core': there is no equilibrium and the likely outcome is therefore instability (Inman and Rubenstein, 1997). The political system continues to try to build a minimum winning coalition which captures all the benefits of public expenditure for its own members. However, no such coalition can persist. Any group which assembles 51% support can always be supplanted by some

other alliance. Hence, majorities keep forming and breaking up. As Drazen (2000) notes: `Indeterminacy in general…is seen as perhaps the major defect of majority voting as a choice mechanism' (p71-72). However, whichever group is temporarily in power has an incentive to sacrifice overall growth for redistribution to its own supporters. It consequently chooses a high tax rate in order to benefit from the resulting expenditure. Each group only benefits temporarily from the expenditure, but since the tax rate is sustained, there is a continuous sacrifice of growth. Appendix A sets out a simple model in which the best tax rate is zero, but a minimum winning coalition will set a tax rate of 33%.

Now introduce identity politics. First consider the consequences of exogenous party loyalties in the case of fragmentation: no ethnic group constitutes a majority. Since unstable minimum winning coalitions inflict costs on most or all groups in society, there are mutual gains from co-operation if only a bargain can be negotiated and enforced. Since the game is played repeatedly, if there were only two players (the leaders of two political parties), there would be no dilemma: in a two person repeated game both players come to deploy a tit-for-tat strategy, and this enforces co-operation. A reasonable presumption is that the more players are in the game, the less likely is it that legislators can escape from the dilemma (Hardin, 1996), although Drazen (2000) shows that this need not be the case in sufficiently complex models of political bargaining. If legislators are grouped into strong parties which can discipline their behaviour and so enforce agreements, the number of players is reduced and so co-operation may become easier. This suggests that in a parliamentary system, the presence of exogenously given party identity, on whatever basis, is useful. If the alternative to ethnic politics is parties which are too weak to control legislators, ethnic identity might be an improvement. However, comparing among societies all of which have ethnic politics, the more ethnically fractionalised is the society, and hence the greater the number of political parties, the more difficult it might be to arrive at the co-operative solution. Thus, differentiation into say three equal parties may be an improvement upon homogeneity, but differentiation into thirty parties would be worse than into three.

Now consider identity politics in the circumstances of ethnic dominance. Suppose, as before, that there is ethnic politics in `South Africa' with one ethnic group holding a

majority of 65%. If the group holds together it can now capture 100% of the expenditure and so does very well. Ethnic identity may be sufficiently strong to enforce cohesion on the dominant ethnic group, producing a stable winning coalition, although the group would be inefficiently large. If it could do so without losing cohesion, the party of the dominant ethnic group would slim down to representing just 51% of the electorate, conferring larger benefits on its remaining members. Assuming that an ethnic party is only able to keep a stable political majority by including its entire ethnic group, then an interesting paradox follows. A dominant ethnic group will do more damage to growth the smaller is its majority. For example, a group with only just over 50% of the electorate is indeed a minimum winning coalition and so, in the example in Appendix A will set the tax rate at 33%. By contrast, if the dominant ethnic group constitutes 90% of the electorate and is all represented by the same party, it will choose to set the tax rate at under 5%: redistribution is not worth the costs because the minority is too small to be worth exploiting. While ethnic politics in the context of ethnic dominance is liable to produce discrimination against the minority, this is obviously not specific to ethnicity as a basis for political identity. Any system in which electoral allegiance is based on identity will have the same tendency if one party has a permanent majority.

To summarise, inserting ethnic parties into democratic systems generates the following propositions. In the (probably unusual) circumstances of single issue politics, ethnic fragmentation will not have large effects. Ethnic dominance may have moderately large effects, but there will be no systematic effect on growth. In the (more usual) circumstances of multi-issue politics, without identity politics the expectation is of instability due to the lack of an equilibrium. Ethnic dominance confers durable power on a winning coalition which then has an incentive to sacrifice growth for redistribution, although the incentive is weaker than for a *minimum* winning coalition. Limited ethnic fragmentation facilitates co-operative outcomes which avoid or reduce the costs of unstable minimum winning coalitions. However, the greater the extent of ethnic fragmentation, the more difficult is it to reach a co-operative solution.

3.1.3. Differences in the role of identity politics. Before turning to econometric testing of these propositions it is useful to `ground truth' them against the differing role of

identity politics in the democracies of America, Europe and Africa. American political allegiance, at least at the national level, is not strongly related to identity: many voters are willing to switch between parties based on current interests. In Europe political allegiance is more influenced by identity, with the basis for identity being class, religion, language or history rather than ethnicity. Because European electors tend to have these exogenous loyalties to parties, and the party leaders control candidate nominations, parties are much stronger than in America, with party leaderships controlling how legislators vote. In Africa party identification is normally ethnic except where such identification is deliberately suppressed.

The above analysis of multi-issue politics would predict that in America the weakness of parties due to the absence of identity politics would produce unstable minimum winning coalitions. This is not borne out in American experience. Instead of congressional voting being characterised by minimum winning coalitions of changing composition, most spending votes are supported by large majorities, the phenomenon being known as `pork barrel politics'. A large body of theory has developed to explain this behaviour (see for example, Weingast, 1979). The argument is that changing minimum winning coalitions would be highly disadvantageous for the legislators. Periodically, they would be unable to provide any benefits to their local electors and so would risk being defeated. Legislators have therefore evolved a pattern of behaviour in which each legislator is given equal powers over the agenda. Specifically, each has the power of proposing an expenditure which benefits his locality. Legislators may devise benefits which are complex non-monetary transfers, thereby making it more difficult for voters to understand the true costs and beneficiaries (Coate and Morris, 1995). Proposals are log-rolled, an implicit norm of deference among legislators amounting to `I'll scratch your back if you'll scratch mine'. While this is good for legislators, it is not good for the economy. The projects must be paid for and so, as with minimum winning coalitions, the outcome is that expenditure is too high. The problem is that there is no process for internalising the externalities of the taxes needed to pay for the expenditures, analogous to the `restaurant bill problem' in which if a group of people agree to share the bill, they all have an incentive to over-eat. Hence, pork-barrel log-rolling results in inefficient

reductions in growth. To counter this, the American constitution gives veto powers to the President.

Evidently, the practical problem in democratic politics appears to be pork-barrel log-rolling rather than unstable minimum winning coalitions. Potentially, however, exogenous strong parties can again reduce the problem. Party leaders internalise the negative fiscal externalities of pork-barrel politics. Empowered by stable voter allegiance they can co-operate to rein-in log-rolling and so improve economic performance.

The European parliamentary system, being more characterised by identity politics, is therefore predicted to have less of a problem with log-rolling. Further, the huge variation within European politics in the number of parties provides a test of the proposition that fragmentation will reduce the durability of inter-party co-operation. Both of these propositions find empirical support. Schofield (1996) shows that within Europe variation in the number of parties (associated with whether or not there is proportional representation) is associated with a shorter life of governing coalitions. However, he argues that the effect is too weak to constitute a substantial problem.

Recent democratizations in Africa provide an unusual opportunity to see what happens when ethnic politics is suppressed. There are currently two experiments in which a party contest previously based on ethnicity was purged of ethnic identity. In the 1960s both Ugandan and Nigerian political parties were ethnically based with legislator voting following these party lines. After a period of dictatorship democracy has been re-established, but with a constitutional changes which suppress the old parties. In Uganda legislators are elected to parliament, but are not allowed to campaign except as individuals: there are no parties. In Nigeria, two new political parties were imposed by the departing military government, each with requirements to be multi-ethnic. The result to date has been a dramatic confirmation of Weingast's theory that weak parties produce legislative log-rolling. As in America, both legislatures have had a strong, universalist, pro-expenditure bias.

3.2. Dictatorship

I now turn from democracy to dictatorship. With or without ethnic parties, democracy is unlikely to reach the hypothetical social planning optimum. An all-powerful, all-knowing

dictator could *be* the social planner, for example, overcoming the restaurant bill problem. However, even the benevolent social planning dictator is in practice not all-knowing. Indeed, he will lack much information revealed through democratic processes and so miss opportunities for mutually beneficial political deals. Hence, a priori, it is ambiguous whether benevolent dictatorships are more or less efficient than democracy. More fundamentally, there is no particular reason why a dictator should have this objective. Olsen (1991) argues that in the absence of democratic checks, rules will tend to abrogate property rights. Indeed, because they lack the power to bind themselves, even benevolent dictators face a classic time-consistency problem in which potential investors cannot infer from current benevolence that future policy will not become predatory. Empirical studies of the effect of dictatorship on economic performance have generally failed to find a clear effect (Benabou, 1996), suggesting that the scope for a social planner to outperform democracy roughly offsets the scope for dictators to be more predatory than elected politicians.

The theoretical literature on dictatorship has not previously analysed the effect of ethnic diversity. A useful starting place is to consider the power-base of the dictator. A benevolent dictator who succeeds in realising the gains of social planning may be sufficiently popular not to need military support: was Lee Kwan Yew a dictator of Singapore or an astonishingly successful politician? In what follows I will treat benevolent dictators as random `acts of God', distributed without relation to ethnic diversity. Instead, I focus on those dictators who do not take the social planning route to the maintenance of power. They must rely upon an army. In Section 2 I suggested that rebel military organisations need cohesion and so must avoid the impediments to co-operation introduced by recruiting across ethnic boundaries. Self-serving dictatorships are analogous to rebel organisations and face the same constraint. Further, in ethnically diverse societies, kinship or tribal loyalties are likely to be useful in maintaining military cohesion. Currently, the most spectacular example of the use of kinship by a dictator is surely Saddam Hussein's control over the Iraqi military, with key positions dominated by his own Tikriti clan. The pattern is widespread: either dictators shape the army around their own ethnic identity (as with Saddam Hussein), or perhaps more commonly, an army which is already ethnically distinctive produces a coup leader from its ranks (as with Idi

Amin in Uganda). This relationship between ethnic cohesion and the power base of dictatorship has the important implication that *the more ethnically fractionalised is the society, the narrower is the maximum military support base of the dictatorship*. In turn, unless this is offset by other differences, this lower maximum will imply that on average predatory dictatorships will have narrower support bases the more ethnically fractionalised is the society. Note that the relationship only holds on average. One exception is that even in an ethnically homogenous society a dictatorship may choose to build a support base which is socially very narrow, as in Duvalier's Haiti. A second is that a society which is highly fractionalised may happen to have a dictatorship based on its largest ethnic group, whereas a relatively unfractionalised society may have a dictatorship based on its smallest ethnic group, the latter being smaller than the former.

The size of the military support base is important because in practice dictators are not individually all-powerful. A dictator who failed to satisfy the material aspirations of his military support base would be replaced by an internal coup. For example, the Nigerian military replaced its dictator on several occasions while maintaining the same ethnic power base. An approximation to this state of affairs is to characterise the dictator as the elected leader but on a franchise confined to his own ethnic group. The military power of the ethnic group confers on it the power to determine policy. The outcome which would be expected then follows from the above analysis of ethnic dominance in the context of multi-issue politics. As in that case, the government is free to redistribute in favour of the ruling ethnic group. The key difference is that now the `winning coalition' need not constitute a majority of the population. Far from trying to make such discrimination discreet, as Coate and Morris suggest happens in democracies, the dictator needs to demonstrate his favouritism as visibly as possible. The threat he faces is not national voter anger at the costs of patronage but an internal coup from within the group he needs to favour. He must locate infrastructure in the locality of his ethnic group, and he must skew public employment to those members of his group who come to the capital for jobs. For example, during the time of President Kenyatta, a Kikuyu, the main Kikuyu city grew very rapidly at the expense of non-Kikuyu cities such as Kisumu and Mombasa. When President Moi took over, he built a new international airport in the small town which was the heartland of his own minor tribe, the Kalenjin. Over the years,

employment in the post office, the part of the public sector most intensive in unskilled labour, has become dominated by the Kalenjin.

Recall from the previous analysis that the costs of ethnic dominance are predicted to be *decreasing* in the size of the dominant group. The smaller is the group, the stronger is the incentive for it to choose redistribution to itself at the expense of growth to the economy as a whole. In the context of democracy, this rising cost as the size of the group diminishes was checked by the barrier of 50%: below this level the group is not in power. However, in dictatorship, there is no such barrier. Remarkably small ethnic groups have always been able to retain military power. In eleventh century England and Southern Italy the Norman ethnic group seized and maintained power to their own advantage despite constituting only some 2% of the population. In twentieth century Burundi and South Africa ethnic minorities of less than 20% of the population did likewise.

Such narrow winning coalitions would have a much stronger incentive to sacrifice growth than the larger winning coalitions in democracies and this leads to a clear prediction: *dictatorship will tend to be more detrimental to growth the more ethnically fractionalised is the society*.

3.3. Testable hypotheses

I now bring together the testable propositions on the effects of ethnic differentiation in democracy and dictatorship, and see whether they are supported by econometric evidence. The likely effects of ethnic diversity in different political systems are summarised in Table 1. The presumption that ethnic politics is damaging regardless of the political system is not supported by the theories discussed above. Rather, ethnic diversity is predicted to be damaging in particular circumstances, namely dominance and dictatorship. Other than in these circumstances theory does not provide a clear prediction. Ethnic politics may facilitate the internalisation of externalities lacking when party leaders cannot control legislators. However, ethnicity may simply substitute for some other basis for stable voter allegiance, as with the class identity politics common in Europe, or other features of the constitution may compensate for the effects of weak parties.

In societies characterised by ethnic dominance the government has both the power and the incentive to trade off redistribution at the expense of growth. Whether the system is democratic or dictatorial will make no difference if the same group is in power, but the dictatorship will be radically worse if it permits a minority to maintain power. In democracy, the problem diminishes the larger is the ethnic majority, and if there is single-issue politics.

In ethnically fragmented societies predatory dictatorships will be highly damaging, with narrow groups exploiting their power at the expense of overall growth. In ethnically homogenous societies predatory dictatorships may be just as narrowly based and hence just as damaging, but they will tend to be less narrowly based. Outside the context of dictatorship, ethnic fragmentation does not appear likely to produce markedly worse politics than ethnic homogeneity, and indeed the political system might work better.

3.4. Empirically testing the hypotheses

These analytic predictions are empirically testable. I use the conventional Barro-Lee data set which includes all countries for which sufficient data are available. I arrange the data so that the dependent variable is the growth rate for a country over the period 1960-1990. I introduce explanatory variables which help to control for non-policy influences on growth, such as whether a country is landlocked, but exclude policies as explanatory variables because these are the result of the political process.

First, I test for the effects of ethnic diversity. Recall that the Easterly and Levine proposition is that ethnic diversity is directly detrimental because it produces bad political decisions. Above, I have argued that this is not sufficiently nuanced: in democracies the effects of ethnic politics are likely to be small and ambiguously signed, whereas in dictatorships ethnic loyalties are liable to intensify predatory behaviour. I test this more nuanced proposition against that of Easterly and Levine. I do this by interacting the measure of ethnic diversity (ELF) with a measure of political rights. The core results are shown in Table 2: this interaction term is highly significant and large.[1] Ethnic diversity has no adverse effects on growth in fully democratic societies, but reduces growth by up to three percentage points in dictatorships

In the last two columns of Table 2, I test for the effects of ethnic dominance. Recall that unlike in the case of ethnic fragmentation, I predict that ethnic dominance will reduce growth regardless of the political system. The magnitude of this negative effect is predicted to diminish with the size of the dominant group. I approximate this effect by introducing a dummy variable which takes the value of unity over a particular size range of the largest ethnic group. I experiment with different ranges. For example, it may be that a group is able to control national policy even if its share of the population is slightly less 50%. Conversely, a group with 95% of the population may find that the benefits of exploiting the minority are outweighed by the costs. I find that for all possible values the sign of the ethnic dominance dummy is negative, but the effect is at its maximum and the significance level highest for the range 45-60%. This regression provides some weak support for the hypothesis that ethnic dominance is detrimental to the growth process. Societies with such a dominant ethnic group on average lose over half a percentage point of the growth rate. The effect is only statistically significant at 18%, far below conventional levels. However, the results are still of some interest. The significance level measures how often we would get this result by chance were we drawing a sample of 102 countries randomly from a much larger population of countries. In fact, 102 countries is quite close to being the entire population. Thus, we should conclude that on average countries with ethnic dominance had quite substantially slower per capita growth, but that there was considerable variation around this average. The inclusion of ethnic dominance does not alter the coefficient on the interaction of ethnic diversity and the political system, or its level of significance.

To conclude, there are both theoretical reasons and empirical evidence to support three propositions on the effect of ethnic differentiation on political outcomes. The most important proposition is the negative one that in democracies, except in circumstances of dominance, ethnic diversity does not significantly adversely affect economic performance. Contrary to the apparent implications of Easterly and Levine and Alesina *et al.*, ethnic diversity is not, therefore, in general problematic for economic policy. The second proposition is that ethnically diverse societies are peculiarly ill-suited to dictatorship. This is precisely contrary to the self-justifying arguments of third world

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dictators. The third proposition is that ethnic dominance is likely to worsen economic performance, regardless of the political system. The empirical evidence for this proposition is weaker. Further, most ethnically diverse societies are not characterised by dominance. Taken together, these propositions evidently do not amount to a condemnation of ethnic diversity.

Recall that the microeconomics literature on ethnicity in organisations has found some quite substantial negative effects. At least within the public sector, there was disturbing evidence that ethnic diversity is detrimental to performance. Evidently, this does not `scale up' to worse overall national economic performance. Perhaps this is because the effects on public sector performance are too small to show up in aggregate performance. Alternatively, it may be because worse performance in the public sector is offset by enhanced performance in the private sector. The New Institutional Economics perspective is after all that kin groups enhance the economic performance of the group. Possibly, in the public sector the benefit for the group is the capture of rents (as in Ghana), whereas in the private sector it is enhanced productivity.

I now test the proposition that ethnic diversity is detrimental in the public sector but advantageous in the private sector. For this we need to be able to distinguish factor productivity in the two sectors, and a convenient new data set is that of Collier, Hoeffler and Pattillo (2001). They build estimates of public and private capital stocks for 58 countries and estimate an aggregate production function. Their analysis is unrelated to ethnic diversity, investigating the effect of capital flight, but it can easily be adapted to the present purpose. Their production function explains GDP in terms of the public and private capital stocks and labour. Although it is estimated as a cross-section using period averages for 1980-89, country fixed effects are included, being derived from a generalised method of moments growth model for 1960-95 (Hoeffler, 1998). For 56 of these countries, data are available on the extent of ethnic diversity, and so for this sample it is possible to investigate whether ethnic diversity raises the productivity of private capital and lowers the productivity of public capital. To test for this I add to the production function two interaction terms, one for ethnic diversity and the private capital stock, and the other for ethnic diversity and the public capital stock.

Details of the variables and the method are given in Collier, Hoeffler and Pattillo (2001).[2] The following observations can be made. The addition of the two interaction terms is jointly significant at the 10% level: ethic diversity does significantly change the productivity of capital. Further, the signs of the two interaction terms differ: societies which are diverse have a higher productivity of private capital than those which are homogenous, but a lower productivity of public capital. I test for whether the coefficients on the two interaction terms are significantly different from each other. As shown in Table 3, they narrowly fail this test: there is a 15.8% risk that ethnic diversity does not differentially effect the productivity of public and private capital. Nevertheless, the balance of probabilities is sufficiently strongly in favour of a difference that it is worth investigating the size of the differential effects implied by the coefficients. In this sample the mean of ethnic diversity as measured by ELF is 47 and the standard deviation is 30. I compare the productivity of capital between countries one standard deviation above and below the mean, that is with ELF values of 17 and 77. The productivity of each type of capital now depends upon the net effect of the interaction term and the direct effect. The productivity of public capital is 10% lower in the ethnically diverse society (77) than in the ethnically more homogenous society (17). By contrast, the productivity of private capital is 5% higher in the ethnically diverse society than in the more homogenous society. These orders of magnitude are neither too large to be credible nor so small as to be without interest. Further, since the private capital stock is usually larger than the public capital stock, differential effects of this magnitude would in aggregate approximately offset each other, hence being consistent with the previous result that in democratic societies diversity does not have an adverse effect on aggregate economic performance.

Before considering the implications further, I turn to the effect of diversity on the risk of civil conflict. Even if diversity is normally unproblematic for the economy, it might sometimes be disastrous for the society.

4. DOES ETHNIC DIVERSITY CAUSE CIVIL WAR?

While popular discussion of the cause of civil conflict focuses upon the motivations of the rebels, I have found it more revealing to focus on how rebellion is organised and

financed. In effect, I am emphasising the budget constraint rather than preferences as an explanation for variation in behaviour. I first explain the basic theoretical idea. I then discuss the econometric evidence which supports this model over rival accounts which emphasise rebel grievances. Taking the theoretical results as a baseline I then investigate how ethnicity affects the risk of conflict through three routes.

4.1. The financing of rebellion

The basic theoretical analysis treats the motivation for rebellion as exogenous. In effect, I assume that in all societies there are some groups keen to further their objectives through organised large scale violence, and what determines whether this happens is the feasibility of maintaining a military organisation opposed to the government but on its territory.

A rebel organisation must be able to defend itself from government forces. This military survival constraint depends partly upon geography and partly upon the ability of the government to finance defence expenditure. The constraint determines the minimum size of rebellion which is viable, and in turn, this affects the cost of rebellion. The larger must a rebel organisation be to survive militarily, the more demanding are the financing requirements. The other component of the cost of rebellion is the ease or difficulty of recruitment of rebel labour. While the size of the government army can be assumed to be in steady state, the rebel organisation is wholly dependent upon current recruitment and so is disproportionately sensitive to the current tightness of the labour market. Hence, the costs of rebel recruitment are assumed to be increasing both in per capita income, and in the rate of growth. The ability to rebel then depends upon the available sources of finance. In the basic model the source of rebel finance is predation of primary commodity exports. These activities are assumed to be particularly vulnerable in view of their location-specific rents and their long transport routes to ports. Hence, the basic predictions of the analysis (for a formal analysis see Collier (2000a)) are that the risk of rebellion will be increasing in primary commodity dependence and decreasing in per capita income and the rate of growth.[3]

Although this abstracts from the motivation for rebellion, the conditions under which a rebellion is financially viable are also those under which it is financially

attractive. Hence, a more cynical interpretation of this, and the supporting econometric evidence discussed below, is to see finance as *motivating* rather than merely *enabling* rebellion. The econometric evidence cannot discriminate between the two interpretations, but case study evidence sometimes points strongly to finance as a motivation. For example, during the civil war in Sierra Leone, the predation of the diamond fields by the RUF rebel organisation could be interpreted as either enabling or motivating. However, during the peace negotiations, the rebel leader rejected the offer of the Vice-Presidency, insisting additionally upon being Chairman of the Council of Mineral Resources. Such behaviour is hard to interpret as other than revealing motivation. Those rebellions which appear least related to financial motivation are ethnic liberation secession movements. However, even here the underlying motivation may often be the capture of primary commodity rents.

The financial rationale for secession on the part of rich districts was first modelled analytically by Buchanan and Faith (1987). Their insight can usefully be linked to Anderson's notion that political communities must be `imagined'. The population of a district which initially `imagines' itself as belonging to the larger nation can re-imagine itself as a distinct political community once natural resources are discovered. Since ethnic groups, like natural resources are also geographically concentrated, the resulting political community may be broadly coincident with some ethnic group. Thus, the creation of a political community for the control of a region's natural resources may also create a political community for the ethnic group.

I will give five examples, three of which are related to oil discoveries and price shocks. In Zaire, copper and diamonds are concentrated in the South-East. The secessionist Katanga movement was formed in this region shortly after independence. In Nigeria, the oil discoveries of the 1960s were also concentrated in the South-East. The secessionist Biafra movement was formed in this region in 1967. In the UK the oil discoveries were concentrated off the shores of Scotland. The secessionist Scottish National Party, after years with negligible electoral support, suddenly broke through in 1974, months after oil became valuable due to the hike in the oil price. In Indonesia, the oil discoveries were concentrated on the outer islands, notably Aceh with a per capita GDP triple the national average. The secessionist Merdeka Aceh movement was formed

in 1979 by a local businessman. In Ethiopia, the richest region was the coastal belt which had been industrialised by the Italians: Eritrea, with a per capita GDP double the national average. In 1951 the Eritrean population voted for federation with Ethiopia, (suggesting that at that stage it was not an imagined nation), but a decade later the Ethiopian government dissolved the Federation, and hence drastically reduced fiscal autonomy. The Eritrean Liberation Front was formed shortly after this dissolution. Four of these five new political communities went on to mount secessionist civil wars. In such situations, although the conflict takes on the appearance of a demand for ethnic liberation, ethnicity is secondary to geography. For example, the Eritrean secession aggregated nine different ethno-linguistic groups into a common political community, while splitting the Tigrini ethno-linguistic group between Eritrea and Ethiopia. Hence, what appears to be a demand for ethnic liberation based on a primordial sense of identity, may more reasonably be interpreted as at root an attempt to control lucrative primary commodities which has created the ethnic identity as a by-product.

4.2. Quantitative empirical evidence

Together with Anke Hoeffler, I have tested this model against alternative explanations of conflict based on the intensity of objective grievance (Collier and Hoeffler, 1998, 2000). The data set covers 161 countries over the period 1960-99, arranged into five year sub-periods, giving a total of 1288 potential observations. In 73 of these observations a civil war broke out. Here a civil war is defined as is conventional in the conflict literature as a conflict between a government and an identifiable non-government organisation which takes place on the territory of the government and causes at least one thousand combat-related deaths. We then try to explain why conflict erupted in these 73 instances but not in the other 1215 instances. Our methodology is that of logit regressions, with the risk being explained by the characteristics in the preceding five year period. We then use non-nested tests to compare the model with alternatives in which both ethnicity and various measures of grievance are included. The basic model performs surprisingly well, with around 30% of the variance explained and all variables significant with the expected signs and survives a battery of robustness tests.

The effects of primary commodity dependence are very powerful: comparing two societies with otherwise mean characteristics, the risk of conflict is less than one percent if the society has no primary commodity exports, whereas it is 23% if such exports constitute a quarter of GDP. Nor is this simply a cross-section association. When the regression is run as a fixed effects panel, so that the only variation in primary commodity export dependence is over time, the relationship remains the same: an increase in primary commodity dependence increases the risk of conflict.

The importance of primary commodities in conflict has recently been recognised outside the research community. The NGO Global Witness has conducted a campaign against `conflict diamonds', highlighting their role in the conflicts of Angola and Sierra Leone. De Beers, the world's largest diamond company, has ceased to purchase diamonds on the open market and has proposed a plan to tighten regulation of the market. With Antwerp as the world's major trading centre for diamonds, Europe is critical for the effective implementation of this plan. The objective is to create a substantial discount in the price rebel movements receive for diamonds, thereby squeezing them financially. A second primary commodity which is now recognised as central to rebellion is cocaine. For example, this generates around $500 m annually for the FARC rebel movement in Colombia. Because OECD governments have persuaded developing country governments to make production illegal, they have created a demand for territory which is not under government control. Rebels supply such territory to drug growers in exchange for a rent (Brito and Intriligator, 1992).

Whereas primary commodity exports are thus important risk factors, some grievances widely assumed to fuel conflict appear to be unimportant. Neither the degree of income inequality, nor the degree of political rights are significant, and their inclusion in the model is rejected by non-nested tests. There is some evidence from Europe that income inequality increases voter support for `revolutionary' propositions, (MacCulloch, 1999), but evidently, such support does not translate into large scale organised killing. The unimportance of grievance variables strengthens the argument that large scale organised killing is dependent upon the unusual circumstances which produce organisational feasibility more than upon motivation. Indeed, the only variables which

non-nested tests show must be added to the basic model are three measures of ethnic and religious diversity. I now focus in detail on these effects.

Ethnicity enters the model in three ways. First, ethnic dominance might be a sufficiently compelling grievance factor that it affects the risk of conflict. In the previous section I discussed why with dominance there is both the ability and the incentive for the majority to exploit the minority. The structural permanence of this condition, and the inability of democracy to resolve it, may make organised violence more likely. In the simple theory of Section 3, dominance abruptly becomes a problem once the group exceeds 50% of the electorate. This is also the point of maximum incentive to exploit. Thereafter, exploitation diminishes as the share of the majority group increases. In testing the effect of dominance on conflict risk Hoeffler and I follow the same procedure as for its effects on economic performance, introducing a dummy variable which takes the value unity if the largest ethnic group is in a particular size range, the range being determined by experiment. We also test this specification against a variable which simply measures the share of the population constituted by the largest ethnic group. As shown in Appendix B, the level of significance and the size of the coefficient reach a maximum when dominance is defined on the range 45-90% of the population. This specification is also preferred to that in which the population share of the largest ethnic group is included. So defined, societies with ethnic dominance have around double the risk of civil war of other societies. This is consistent with the theory that in this range majorities have both the ability and the incentive to exploit minorities. Evidently, given this structural problem, it is arbitrary whether the rebel group is drawn from the minority, as in Sri Lanka, or whether the minority preemptively controls the government, but faces rebellion from within the majority, as in Burundi. While the model thus finds evidence that ethnic dominance is problematic, the scale of the effect should be kept in perspective. The effect of ethnic dominance can, according to the model, be fully offset for the mean country by reducing dependence upon primary commodities from 16% of GDP to 11%.

The second way by which ethnic diversity enters the model is through fragmentation. Recall that the rebel organisation is assumed to need cohesion and for this must avoid recruiting across boundaries of identity. Societies which are fragmented by ethnicity or indeed by other types of identity thus pose greater problems for rebel

organisations. A possible example of this is Irian Jaya in Indonesia. This province is dependent upon primary commodity exports and over the past thirty years many small groups have attempted to mount armed opposition to rule from Indonesia. However, none of these groups succeeded in building a viable rebel organisation of any scale. A likely reason for this is that Irian Jaya is so astonishingly ethnically fragmented, with some 450 distinct language groups: the groups simply cannot cohere into a military organisation. In principle, the same effect would be generated by religious fractionalisation as by ethnic fractionalisation. Societies divided by both ethnicity and religion would potentially be even more protected from rebellion if the religious divisions were cross-cutting over the ethnic divisions. A society equally divided into e ethnic groups and r religious groups, with religion cross-cutting ethnicity, would be divided into $e \cdot r$ distinct cells. There is good data on the composition of societies according to religion, but unfortunately, this cannot be related to ethnic divisions. At one extreme, ethnic and religious divisions might be coincident, and at the other they may be perfectly cross-cutting, and so the empirical testing must allow for these possibilities. To incorporate the effects of religious fractionalisation Hoeffler and I built a measure of religious fractionalisation, RF, precisely corresponding to the index of ethno-linguistic fractionalisation (for details see Collier and Hoeffler, 2000).

One possibility is that both ethnic diversity and religious diversity matter but that there is no interaction effect. We test for this by introducing both measures into the logit regression. At the other extreme, only the interaction effect might matter. We measure the interaction effect by constructing an index of `social fractionalisation' which proxies the concept $e \cdot r$. The interaction term is approximately the product of the two measures of diversity, $\text{ELF} \cdot \text{RF}$. However, if there is religious homogeneity but ethnic diversity, the measure of social fractionalisation should collapse to the measure of ethnic diversity rather than to zero (and conversely if there is religious diversity but ethnic homogeneity). To allow for this we measure the index of social fractionalisation as the interaction term $\text{ELF} \cdot \text{RF}$ plus whichever is the maximum of ELF and RF. In practice, this is a very minor modification and the measure of social fractionalisation performs virtually identically whether it is defined in this way or more simply as $\text{ELF} \cdot \text{RF}$. Appendix C reports the results of nine different variants of ethnic and religious fractionalisation. In each case we

control for ethnic dominance which non-nested tests show to have a distinct effect which should be included in the model. The interaction effect `social fractionalisation' dominates the direct effects of religious and ethnic diversity. Indeed, once `social fractionalisation' is included, neither direct effect is significant. Thus, ethnic and religious divisions are apparently usually cross-cutting. Not only does social fractionalisation dominate the direct effects, it is highly significant with a *negative* sign, and is a large effect. Hence, the risk of civil war is *lower* in societies which are fractionalised by ethnicity and religion. Such societies might well have higher levels of hatred, but this does not usually translate into large-scale organised killing.

This effect of ethnic and religious diversity also accounts for why so many civil wars *appear* to be caused by ethnic or religious hatreds. Most societies are to some degree diverse. Where rebellions occur in such societies, the organisational constraint of cohesion will tend to confine recruitment to a single cell of the ethno-religious matrix. Rebellion will be *patterned* by ethnicity and religion even if it is not *caused* by ethnic and religious differences. A good example of this process is the recent violent attempted coup d'etat in Fiji (Frank, 2000). The demands of the coup leader, George Speight, were ostensibly entirely related to ethnic power: he claimed to want a transfer of power from the Indian part of the population to the aboriginal group. However, beneath this apparent instance of ethnically motivated political violence was a quite different story. Fiji has the world's largest plantations of mahogany. Indeed, it is forecast to supply two-thirds of the entire world market, constituting the single most important asset in Fiji. In 1998 the government began the process of putting out to tender the management contract for the mahogany plantations. Two companies were shortlisted: the Commonwealth Development Corporation (CDC) and a private American company. The American company hired a local businessman as its representative, none other than George Speight. Eventually, the government awarded the contract to the CDC. Shortly after losing the contract, Mr. Speight launched his coup. The loss of the contract by an American company to the Commonwealth Development Corporation evidently did not provide a very robust basis for a popular political uprising against a democratic government. Mr. Speight indeed loudly denied that the motivation was the loss of the mahogany contract. Instead, as noted above, he chose ethnicity as his rallying cry: the government happened

to be drawn from a predominantly Indian party, whereas Mr. Speight was not Indian. In short, the conflict was ethnically *patterned*, but not ethnically *caused*.

Taken together, the effect of ethnic dominance and cross-cutting fractionalisation produce a broadly non-monotonic relationship between the number of ethnic groups and the risk of conflict. Moving from one to two groups almost inevitably switches the society into ethnic dominance. Usually, this is not fully offset by the benign effect of the increased fractionalisation, so the society overall becomes more at risk. Moving from two to many groups almost inevitably switches the society back out of ethnic dominance and gradually increases fragmentation, making the society safer than were it homogenous.

The third way by which ethnic diversity enters the model is through diasporas living in Europe and America. Although the basic model considers only primary commodity predation as a source of rebel finance, an obvious extension is to consider financial contributions from diasporas living in high-income countries. Angustures and Pascal (1996) provide a chilling series of case studies showing how such diasporas are currently organised by rebel movements to finance conflict. This role of diasporas has a long history. For example, Irish-Americans assisted the secession of Eire from the UK, Jewish-Americans assisted the secession of Israel, Eritreans in Europe and America were the main source of finance for the secession of Eritrea from Ethiopia, and currently Tamils in Canada are financing the attempt of the Tamil Tigers to secede from Sri Lanka. Hoeffler and I investigated the effect of diasporas more formally, using data on diasporas in America. The size of the diaspora for, say Somalia, was measured as the number of people born in Somalia but resident in the USA, relative to the resident population of Somalia. Since civil war increases emigration, a large diaspora might simply proxy previous conflict. In order to control for this, we estimated a migration model, based upon income differences and time lags, and in all cases where there had been a civil war, replaced the actual diaspora population in America subsequent to the outbreak of the conflict, with a predicted population based on the counterfactual of continued peace. Both with and without this correction we found that the larger was the diaspora the greater was the risk of conflict. The risk applied, however, only in post-conflict situations. Post-conflict, countries temporarily have a very high risk of further conflict. We show that this is not spuriously due to an omitted variable: a dummy variable for whether a country has

had a previous conflict is insignificant. Rather, conflict generates risks which gradually fade again. The effect of diasporas is significantly and substantially to slow down the rate at which these risks fade. Large diasporas appear to keep conflicts alive. This is consistent both with the case study evidence and with theory. Diasporas in OECD economies have the income to finance rebel organisations, often have romantic attachments to their ethnic identity to counter the anomie they experience in their host societies, and do not suffer the consequences of the violence which they finance. They are consequently often more extreme than the populations which they purport to defend.

In order to tap the potential that a diaspora offers, a rebel organisation needs to sell ethnic vengeance. Hence, rebellions need to generate a discourse of ethnic hatred. Thus, in most societies rebellions will not only be organised along ethnic lines, they will be justified in terms of ethnic grievance, and supported by ethnic diasporas. It is unsurprising that in these circumstances ethnic diversity will appear to cause violent conflict. Nevertheless, these appearances are entirely consistent with the big brute fact that ethnic diversity usually makes a society safer. Whether societies suffer an outbreak of civil war is determined more by the financial and military opportunities for rebellion rather than by ethnic hatreds or other objective grievances.

5. POLICY IMPLICATIONS

I started with two charges which are widely made against societies in which ethnicity is the basis for social identity. Ethnically differentiated societies would find co-operation difficult and victimisation of minorities easy. The inability to co-operate would manifest itself in dysfunctional politics and consequently worse economic performance. The tendency to victimisation of minorities would manifest itself as dysfunctional societies beset by violent civil conflict. Such sweeping charges are not justified either theoretically or empirically. As a first approximation, ethnically diverse democracies do not have worse economic performance and are actually safer than homogenous societies.

The fallacious popular orthodoxy that ethnically diverse societies are unviable is directly reflected in current policy towards multi-ethnic societies. Despair has encouraged radical social and political engineering, involving population movements and intricate

border redesign and secession, in order to achieve ethnically less diverse, and hence supposedly more viable, states. The trend to secession since the end of the Cold War, much of it violent, has been remarkable: Eritrea, Slovakia, Slovenia, Croatia, Macedonia, Bosnia, Chechnya, Quebec, Belgium, Kosovo, Montenegro, the Western Sahara, East Timor, Somaliland, Aceh and the Niger Delta are all recent examples of completed, incipient or potential creation of small ethnic states. I have argued that such secessions are often at root economic rather than ethnic. The patina of legitimacy associated with ethnic historicism and political grievance should disguise neither the tendency of secessionist violence to be concentrated in regions well endowed with primary commodities, nor the absence of a statistical relationship with inequality and political oppression. Secessionist states would probably be *more*, rather than less prone to conflict. It is self-evident that as the number of countries increases, so does the risk of *international* war. For example, the secession of Eritrea from Ethiopia has not brought peace but rather reclassified a conflict from a civil war to an international war, bringing with it a severe cost escalation as both parties are now able to field an airforce. However, the more telling point is that such states are also liable to be more prone to *civil* conflict. First, if endowments of primary commodities tend to be the basis for secession, the resulting states would be more dependent upon primary commodities than if they were part of larger political entities. As an approximation, each extra percentage point of dependence upon primary commodities raises the risk of conflict by one percentage point. Secondly, secessionist states would have less ethnic heterogeneity. Recall that contrary to popular perception, this would increase the risk of conflict. Thirdly, as secessions occur from ethnically fragmented states, the residual state is liable to switch from ethnic fragmentation to ethnic dominance. The secessionist state is also more likely to be characterised by ethnic dominance than by ethnic homogeneity. On average, this doubles the risk of conflict. Such a process occurred in the former Yugoslavia: the secession of Slovenia (with international support), created the precedent for the secession of Croatia, which in turn converted the Yugoslav state from being ethnically fragmented, to a Serb majority. The Serb government thereby acquired the power to discriminate in favour of its own supporters. Thus, the main policy implication is perhaps that the international

community has a stronger interest than is currently recognised in the preservation of large, multi-ethnic societies such as Russia, Indonesia and Nigeria.

Since primary commodity dependence increases the risk of conflict, which in ethnically diverse societies then becomes organised on ethnic lines, a further implication is the desirability of export diversification. In Africa dependence on primary commodities has actually increased over the past thirty years and this may have contributed to the region's rising incidence of conflict. By contrast, over the same period other developing regions have on average sharply reduced primary commodity dependence and some of this difference is presumably attributable to economic policy.

While popular opinion has greatly exaggerated the difficulties faced by ethnically diverse societies, I have argued that diversity does create some problems.

At the level of the individual organisation ethnic identity sometimes enhances co-operation and sometimes impedes it. Ethnic group identity is interpreted by institutional economics as an endogenous response to the need for co-operation and evidence from both households and businesses illustrates that ethnicity can be useful in enforcing reciprocity. However, in the public sector there is evidence that ethnically differentiated organisations encounter problems. Thus, a third policy issue is how best to respond to the problem of public sector performance in ethnically diverse societies. I suggest two approaches which are not exclusive. Ethnic employment patronage in the public sector can be countered by greater transparency in hiring and promotion, perhaps reinforced by targets and quota protection for minorities. In developed countries most large organisations now have such explicit policies to safeguard minorities. Thus, there are established procedures which are known to be effective and which could be implemented in the public sectors of ethnically diverse societies. An additional approach is to accept that the public sector may be relatively less effective in diverse societies than in homogenous societies, so that the boundary between public and private activity should be drawn somewhat differently.

At the level of aggregate economic performance there is an important exception to the general proposition that ethnic diversity is not a problem. Dictatorships are an average substantially more damaging in ethnically diverse societies than in homogenous societies. Hence, a fourth policy implication is the need for democratisation in those ethnically

diverse societies which are currently dictatorships. Encouraging democratisation is partly simply a matter of the climate of opinion. If the claim by dictators that they are the alternative to chaos is called into question, then their hold on power is weakened. However, it is also a policy choice for OECD governments: for many years Western governments actively propped up dictators.

A fifth policy implication concerns societies characterised by ethnic dominance. There is a theoretical argument and some weak supporting evidence that such countries have worse economic performance. By itself this would not constitute a sufficient basis for policy intervention. However, there is stronger evidence that ethnic dominance increases the risk of violent civil conflict. Taken together, this suggests that there is a need for better protection of minority rights in societies with ethnic majorities. In developing countries, the struggle for democracy has generally taken the form of empowering the majority against an elite, whether colonial or domestic military. Rights to equal treatment, individual or group, now need to be incorporated into the popular conception of democracy. The recent European Union concern to include protection of minorities as a condition for the continued inclusion of the Austrian government is a powerful practical instance of this redefinition.

A final policy issue, particularly pertinent for European governments, is the role of ethnic diasporas living in Europe and America in promoting violent conflict and separatist movements in their countries of origin. Individual OECD governments are somewhat reluctant to police the external activities of diaspora organisations: often these organisations have some influence in host country political parties. Because of the collective nature of the benefits, contrasted with the individual incidence of the costs, OECD governments need to co-ordinate their policy towards diasporas. International policy co-ordination is usually difficult and is only worthwhile if the benefits are substantial. It would, however, be ironic if the peaceful, prosperous and increasingly multi-ethnic societies of the OECD inadvertently financed the break-up of developing countries into violent and impoverished ethnic theme parks.

Discussion

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The World Bank

What can economists say about the contribution of ethnicity to economic performance? Paul Collier's absorbing and wide-ranging paper shows us that the answer is: quite a lot.

The paper explores the consequences of ethnic *cohesion* on politics, organisational efficiency and war. For the most part, the paper implicitly takes ethnic groups as pre-determined for the processes of interest, including the formation of states. The chief policy question at issue relates to how state boundaries should relate to pre-existing ethnic groups. The paper represents a critique of international policies that – implicitly and sometimes unintentionally – encourage separatism and secession. It presents a defence of the viability of the large poly-ethnic state, especially as compared with states with a single moderately dominant ethnic group.

Evidently the salience of ethnic groups – always a problematic concept – is not pre-determined and exogenous to the sorts of long-term political process that are here in play. Ethnicity is subject to reinterpretation, reconstitution and perhaps (who knows) to a secular decline. Most people function with multiple identities, the relative importance of which is not immutable. Is civil society better-off the further these ethnic identities retreat into the private sphere, and is it hopelessly *modernist* to see the function of good political economy to create institutional structures that transcend ethnicity? It is well to recognise that these are not the questions addressed by Paul's paper.

The analysis here is firmly grounded in empirical reality, much of it based on Africa, but with undoubted relevance to current conditions elsewhere including, in Europe, fraught circumstances as different as those of former Yugoslavia and the Basque region. The current *de facto* trend towards reducing ethnic diversity within states in Europe is not new, as witness the mass-migrations after the Greco-Turkish war of 1919-22, and the almost contemporary partition of Ireland, quite apart from the genocides elsewhere.

Collier's message on war is clear: what appear to be ethnic wars are often, perhaps usually, resource-grabs by elite groups who have manipulated and subverted ethnic loyalties to promote their own ends. The explanatory mechanisms he presents, and the African case studies described, are quite convincing in themselves. Actually, I do not

find that this rings true for Europe (the commercial potential of the bleak and often frozen hillsides of Bosnia and Kosovo appear no more attractive than those of the damp boglands of disputed Armagh and Fermanagh); there is more than one type of ethnic conflict.

But there's much more than African war stories to back-up the assertions of the paper: regression results using data on the world-wide incidence of civil wars since the mid-1960s suggest that the more ethnically (and religiously) fragmented a society, the *less* prone it is to civil war.

As he acknowledges, there are quite severe problems with the standard database on "ethno-linguistic"[4] divisions.[5] It is worth stressing that the standard measure of the degree of diversity – essentially the Herfindahl-Hirschman (HH) index of ethnic group concentration – does not clearly capture the *relevant* aspects of the degree of ethnic division. Traditionally used in antitrust cases, a HH index can be justified from results in non-cooperative game theory as measuring oligopolistic concentration and market power.[6] But it may not be very good at capturing power structures that work, not through the market, but through political and military processes; for these, co-operative game theory can suggest a number of alternative indicators of power and power differentials (such as Shapley's value) and arguably relates more to the world of this paper than to the non-cooperative world where the HH index is at home.[7]

So it is reassuring to find Collier supplementing the standard index, both in considering civil war and economic growth, with a dummy variable for countries with moderately dominant ethnic groups (i.e. in which one ethnic group comprises between about 45 and 90 per cent of the population): they *do* have more civil wars. This finding underlines the inadequacy of the usual index (which will miss the salience of moderate dominance by generating *intermediate* values for such countries).

The paper's analysis of voting mechanisms highlights problems of collective choice which can be alleviated by the existence of multiple pre-formed voting blocs, suggesting that ethnic fragmentation (multiple voting blocs) could help multi-issue democracies avoid some collective choice traps, but that under dictatorship they could worsen the outcome. Democracy's apparent tendency to strengthen ethnic identities, is normally seen as a problem, but if these findings are correct, it can be seen as a positive

feedback. However, this begs the question as to whether ethnic fragmentation might be conducive to dictatorship.

For me, the paper's findings confirm the importance of a strong civil society in which ethnic identities retreat more into the private sphere, thereby making obsolete the redrawing of maps, mass migrations and worse.

Karl O. Moene
University of Oslo

Democracy needs some disagreement to motivate participation. But, "[u]nder what conditions can society have sufficient participation to maintain the democratic system without introducing sources of cleavage which will undermine the cohesion?" (Lipset 1959, p 32-33). Implicitly Collier's fascinating paper goes some way to identify such conditions. The conclusion is that ethnic fragmentation is positive, while ethnic dominance is negative for democracy.

His findings indicate that democratic societies characterised by ethnic fragmentation are not expected to have systematically worse economic policies. Sometimes ethnic fragmentation may even be good for majority voting as democracy may entail too many blocking opportunities. The situation is most difficult when all possible coalitions can be formed implying that even Pareto-improvements may be blocked (Ognedal 1999). Ethnic fragmentation can reduce the problem as fragmentation normally restrict the set of possible coalitions and thus reduce the number of blocking opportunities.

While ethnic fragmentation in this way may be good under democracy, Collier finds that dictatorships work less well with ethnic fragmentation. The power base of the dictator becomes too narrow in fragmented societies. As a consequence the ruler may resort to costly favouritism to cement loyalty. Moreover, ethnic dominance is liable to produce worse economic policies regardless of whether the society is a democracy or a dictatorship. In both cases the majority may exploit the minority.

In the paper, the distinction between fragmentation and dominance is central not only to maintain the democratic system but also for the understanding of tensions,

conflicts and civil wars. The rest of my comments concern these issues as I try to relate dominance and fragmentation to polarisation.

In their seminal paper on polarisation measures, Esteban and Ray (1994) emphasise, in the context of wealth and income, that polarisation is conceptually different from inequality. While polarisation captures substantial intra-group homogeneity and inter-group heterogeneity, inequality simply measures dispersion where the population frequencies in each category carry no weight. While inequality increases with the number of different groups, polarisation is highest with two groups only. In fact, measured inequality may be low even in highly polarised societies. Polarisation may generate tensions and social unrest that can undermine the cohesion necessary for democracy. Polarization can also generate rebellion and intense fighting. Equally strong groups may for instance fight harder and longer than groups of unequal strength (Mehlum and Moene 2000).

Collier does not focus on social cleavages and polarisation and how these aspects may be related to ethnic divisions. Like Easterly and Levine (1997), Collier goes directly to a measure of ethno-linguistic fractionalisation (ELF). One may wonder, however, what ELF predicts with respect to tensions and the possibility of rebellion and revolt. Should we expect a dispersed country like Tanzania, with an ELF score of 93, to be more or less conflict prone than a less dispersed country like Sri Lanka, with an ELF score of 47? To form an opinion on this question and to understand Collier's results, it is useful to take a closer look at what the ELF measure actually says.

The ELF-measure indicates the chance (between 0 and 100) that two randomly drawn individuals of the population belong to different ethno-linguistic groups. Let us consider a society with n groups where the largest group has a population share f and is faced with an opposition consisting of (n-1) groups of equal size. The ELF measure is one minus the probability that two randomly drawn individuals belong to the same group (multiplied by 100 which is omitted below). Thus in our example we simply have ELF= 1-f^2-$(1$-$f)^2$ $/(n$-$1)$

Like inequality measures, ELF increases with the number of groups n, but unlike inequality measures, ELF also increases the more equal the size of each of these groups. This is evident from our example where ELF is increasing in n and obtains its highest

value (for any *n*) when all groups are of equal size, i.e. when $f=1/n$ which yields ELF= *1-1/n.* Societies where $f=.5$ and $n=2$; or where $f=.67$ and $n=3$; or $f=.7$ and *n* is large, all have ELF equal to (around) 50. Yet, these are very different societies indeed.

A completely polarised society along ethnic lines would have two groups of equal size and an ELF of 50. Thus a ranking by ELF cannot capture the degree of polarisation in any accurate manner. With one group consisting of half the population, an ELF-score of 50 would indicate more intra-group homogeneity and would therefore be a more polarised society than those with higher ELF scores.

This is important for the interpretation of how ELF may affect the risk of conflicts. The explanation Collier offers for violent conflicts is interesting and revealing, but does not capture all conflicts. In his story the motive to rebel is exogenous or simply based on greed. He focuses instead on how warlords can finance rebellions. The risk of revolts increases with the primary commodity dependence of the country as these resources are easily looted by warlords. Ethnic dispersion implies that rebels have to be recruited across borders of ethnic identity which may be costly. Hence, ethnically dispersed societies are less at risk of violent conflicts simply because the costs of running rebellion organisations are higher.

One simple complementary explanation focuses on grievance motives of revolts due to social and economic cleavages. "Only those who have nothing to lose ever revolts" as Tocqueville says in Democracy in America. Groups may compete over the control over resources such as primary commodities. Societies at risk of conflicts would then be those that are polarised with groups that are sharply distinguished from each other in wealth and power. Ethnicity would in this story be a catalyst rather than the cause of violence and civil wars.

The policy implications of greed motivated and grievance motivated rebellions are different. Yet, I cannot see that Collier's empirical estimates can distinguish between the two. What Collier finds in his regressions is that "the risk of civil war is lower in societies which are fractionalised by ethnicity and religion". It may be wrong, however, to interpret this as a monotonic effect. If ethnic division is a relevant characteristic for polarisation, we could equally well imagine that polarisation and ELF may be positively correlated for

low levels of ELF and negatively correlated for higher levels of ELF. If that makes sense we should expect a hump-shaped relationship between ELF and the risk of conflict.

To some extent Collier accounts for polarisation by distinguishing between dominance and fractionalisation. But dominance and fractionalisation are clearly not independent. With a dominant group consisting of half the population, the maximum value of ELF is 75, when the second half of the population is completely dispersed. Moreover, by controlling for the presence of a dominant ethnic group, he finds a positive partial effect of dominance and a negative partial effect of ELF for the risk of conflicts. What we should make of these correlations is an open question. The results support the hump interpretation given above equally much as Collier's own theory. Moreover, I think the emphasis on ELF is misplaced.

Looking at the recent African data confirm this suspicion. The data are from the period 1989-1999 which also include battle related deaths down to 25 individuals per year in each country (not only 1000 and beyond as in Colliers estimates). More than half of the African countries had at least one year of violent conflicts in that period, but they seem to be unrelated to ELF. To take some examples: On one end of the spectrum we have Burundi with an ELF of 4 and 8 years of violent conflicts, Rwanda with an ELF of 14 and 7 years of violent conflicts, and Somalia with an ELF of 8 and 8 years of violent conflicts. On the other end of the spectrum we have Angola with an ELF of 78 and 9 years of violent conflicts, Chad with an ELF of 69 and 9 years of violent conflicts, Liberia with an ELF of 83 and 8 years of violent conflicts, Sierra Leone with an ELF of 77 and 9 years of violent conflicts, and Uganda with an ELF of 90 and 9 years of violent conflicts.

In my view Collier is definitely right that we should not be pleased with statements that simply refer to ancestral hatreds to explain these bad events. There may be methods in the madness related both to grievance and greed, and to polarisation and dominance. Yet ELF is not a very informative measure to settle the questions we are interested in.

General Discussion

Alan Winters asked about the policy implication of the paper. He argued that, while many things commonly perceived to be useful are shown not to be useful, it is hard to see what should be done. One apparent result is that democracy is a way of dealing with multi-ethnic societies as long as minority rights are respected. But how are these two linked? He pointed out that democracy may or may not have minority rights. David Wildasin raised the question of what causes ethnic diversity and pointed out that different causes may lead to different policy implications. While in Africa arbitrary borders lead to ethnic diversity, in other cases this came about through migration. He argued that the implications for social and political stability and for economic growth are quite different. For the part that corresponds to voluntary immigration, the presumption is that this is not zero sum in nature. Here, it is likely to be mutually beneficial, possibly with the exception of the 20th century. Historically, where there was not much redistribution by the government, immigration yielded gains from trade. Jorge de Macedo added that it is extremely difficult to define ethnic diversity and it is hard to make generalisations from specific examples. While Russia and Nigeria are very diverse and violent, Brazil is also diverse but not violent. He further pointed out that, in the case of Slovakia, the poorer of two countries sought independence, and was not motivated by the greed for natural resources. In addition, some rebellions are not based on greed, such as the one in the south of Mexico.

Part of the discussion focused on the statistical analysis of the paper. Andrew Rose argued that the first claim of the paper, that ethnic diversity does not lead to civil war, is seriously problematic. From a statistical point of view he felt that the case made has not been made persuasively. He was concerned that the statistical analysis is too short and more sensitivity analysis needs to be done regarding the interaction between the ethnic and religious variables. Andrew Rose also felt that the conclusions are overstated, given that the model does not fit very well. Furthermore, he pointed out that the most important data points are not explained. Cases like Chechnya, Kosovo, Israel and the Palestinians, and the holocaust, cannot be explained by this model. Maximiano Pinheiro also asked to see further sensitivity analysis. Edgar Feige felt that it is important to systematically examine the role of greed as an explanatory variable. It reverses the

priorities that many people have. In order to substantiate the empirical evidence he suggested finding further evidence about the assertion that minorities tend to gravitate to the public sector. He further suggested that a more coherent grouping of countries should be implemented. He argued that there may be a separate model for post civil war societies. He suspected that the existence of a viable external threat to a country is a very important stabilising factor, holding an ethnically diverse country together. Countries where such a threat has disappeared could be grouped and it may be possible to observe systematic differences.

References

Alesina, A., R. Baqir, and W. Easterly (1999). 'Public goods and ethnic divisions', Q*uarterly Journal of Economics*.

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

Angoustures, A., and V. Pascal (1996). `Diasporas et Financement des Conflicts', in *Economie des Guerres Civiles*, F. Jean and J-C. Rufin (eds.), Hachette, Paris.

Arcand, J-L., P. Guillaumont and S. Guillaumont (2000). `How to make a tragedy: on the alleged effect of ethnicity on growth', *Journal of International Development* (forthcoming).

Bates, R. (1999). Ethnicity, capital formation and conflict, Social Capital Initiative Working Paper 12, World Bank, Washington D.C.

Benabou, R. (1996). `Inequality and growth', in B. Bernanke and J. Rotemberg (eds.) NBER Macroeconomics Annual, MIT Press, Cambridge MA.

Biggs, T., M. Raturi, and P. Srivastava (1996). Enforcement of contracts in an African credit market, RPED Discussion Paper, World Bank, Washington D.C.

Bisin, A., and T. Verdier (2000). `Beyond the melting pot: cultural transmission, marriage and the evolution of ethnic and religious traits', *Quarterly Journal of Economics*.

Brito, D.L., and M.D. Intriligator (1992). 'Narco-traffic and guerrilla warfare: a new symbiosis', *Defence Economics*.

Buchanan, J.M. and R.L. Faith (1987). `Secession and the limits of taxation: towards a theory of internal exit', *American Economic Review*.

Coate, S. and S. Morris (1995). `On the form of transfers to special interests', *Journal of Political Economy*.

Colley, L. (1992). *Britons: Forging the Nation*, Yale University Press.

Collier, P. (1999). 'The political economy of ethnicity', in B. Pleskovic and J.E. Stiglitz (eds.) *Annual Bank Conference on Development Economics, 1998*, World Bank, Washington D.C.

Collier, P. (2000). 'Ethnicity, politics and economic performance', *Economics and Politics* (forthcoming).

Collier, P. (2000a). 'Rebellion as a quasi-criminal activity', *Journal of Conflict Resolution* (forthcoming).

Collier, P. and A. Garg (1999). 'On kin groups and wages in the Ghanaian labour market', *Oxford Bulletin of Economics and Statistics*.

Collier, P. and A. Hoeffler, (1998). 'On the economic causes of civil war', *Oxford Economic Papers*.

Collier, P. and A. Hoeffler, (2000). Greed and grievance in civil war, Policy Research Working Paper 2355, World Bank, Washington D.C.

Collier, P., A. Hoeffler and C. Pattillo (2001). `Flight capital as a portfolio choice', *World Bank Economic Review*.

Drazen, A. (2000). *Political Economy in Macroeconomics*, Princeton University Press, Princeton.

Downs, A. (1957). *An Economic Theory of Democracy,* Harper and Row, New York.

Easterly, W. and R. Levine (1997). 'Africa's growth tragedy: policies and ethnic divisions', *Quarterly Journal of Economics*.

Emminghaus, W., P. Kimmel and E. Stewart (1998). `Primal violence illuminating culture's dark side', in E. Weiner (ed.), *The Handbook of Inter-Ethnic Coexistence,* The Continuum Publishing Company, New York.

Esteban, J. and D. Ray (1994). On the measurement of polarization. *Econometrica*.

Fearon, J.D. and D.D. Laitin (1999). Weak states, rough terrain, and large-scale ethnic violence since 1945, mimeo, Dept. of Political Science, Stanford University.

Frank, R. (2000). `Fiji mahogany fuels latest resource battle in troubled region', *Wall St. Journal*, September 13th, A1.

Greif, A. (1992). 'Institutions and international trade: lessons from the commercial revolution', *American Economic Review*.

Grossman, H.I. (1991). 'General equilibrium model of insurrections', *American Economic Review*.

Gurr, T.R. (1993). *Minorities at Risk: a Global View of Ethnopolitical Conflicts*, United States Institute of Peace, Washington D.C.

Hardin, R. (1997). 'Economic theories of the state', in Mueller (ed.) (1997).

Hoeffler, A. (1998). Econometric studies of growth, convergence and conflicts, D.Phil. thesis, University of Oxford.

Horowitz, D. (1985). *Ethnic Groups in Conflict*, University of California Press, Berkeley.

Inman, R.P. and D.R. Rubinfeld (1997). `The political economy of federalism' in Mueller (ed.) (1997).

Lipset, S.M. (1960). *Political Man.* Anchors Books, New York.

MacCulloch, R. (1999). What makes a revolution, Working Paper B24, Center for European Integration Studies, Bonn.

Mehlum H. and K. Moene (2000). Contested power and political instability. Discussion paper, Department of Economics, University of Oslo.

Meltzer, A. and S. Richards (1981). `A Rational theory of the size of government', *Journal of Political Economy*.

Miguel, T. (1999). Ethnic diversity and school funding in Kenya, mimeo, Dept. of Economics, Harvard University.

Mueller, D. (ed.) (1997). *Perspectives on Public Choice,* Cambridge University Press, Cambridge.

Ognedal, T. (1999). Comments on T. Eggertsson, "limits to institutional reforms". *Scandinavian Journal of Economics*.

Olson, M. (1991). `Autocracy, democracy and prosperity', in R. Zeckhauser (ed.) Strategy and Choice, MIT Press, Cambridge MA.

Posner, D.N. (1999). Ethnic fractionalization in Africa, mimeo, Dept of Political Science, UCLA, Los Angeles.

Posner, R.A. (1980). 'A theory of primitive society with special reference to law', *Journal of Law and Economics*.

Schofield, N. (1997). 'Multiparty electoral politics', in Mueller (ed.), (1997).

Shubik, Martin (1982). Game Theory in the Social Sciences, Concepts and Solutions, MIT Press, Cambridge, MA.

Singer, J.D. and M. Small (1994). *Correlates of War Project: International and Civil War Data, 1816-1992*, Inter-University Consortium for Political and Social Research, Ann Arbor, Michigan.

Stigler, George J. (1964). 'A theory of oligopoly', *Journal of Political Economy*.

Tocqueville A. de (1959). *Democracy in America*. Vintage Books, New York.

Weber, E. (1975). *Peasants into Frenchmen*, Stanford University Press, Stanford.

Weingast, B. (1979). 'A rational choice perspective on congressional norms', *American Journal of Political Science*.

APPENDIX A. THE REDISTRIBUTION-GROWTH TRADE-OFF FOR A MINIMUM WINNING COALITION

Following Meltzer and Richards (1981), suppose that taxation reduces income through disincentive effects. This produces a trade-off between redistribution and income. A simple model in which to see this trade-off has each agent receiving total income, T, from a combination of post-tax private income, Y, and a redistribution from the government, B. Suppose that all agents are identical. The representative agent receives:

$$T = (1\text{-}t)Y + B. \tag{A1}$$

If the government is required to balance its budget, then:

$$B = tY. \tag{A2}$$

Suppose that taxation reduces actual income, Y, below potential income, Y^p:

$$Y = (1\text{-}t^2)Y^p. \tag{A3}$$

If the government is a benevolent social planner, choosing the tax rate so as to maximise the total income of the representative agent, it must solve:

$$\max_{t} \quad (1\text{-}t)(1\text{-}t^2)Y^p + t(1\text{-}t^2)Y^p. \tag{A4}$$

The solution is at t=0. Because redistributive taxation inflicts deadweight costs, the best solution in this scenario is to avoid it. Now introduce a minimum winning coalition, retaining the assumption that agents have identical incomes. For the representative agent in this winning coalition, the benefits of redistribution are now changed from (A2) to:

$$B = 2tY. \tag{A5}$$

Accordingly, this changes the maximisation problem for the government, which now represents only the interests of the winning coalition. The government now solves:

$$\max_{t} \quad (1\text{-}t)(1\text{-}t^2)Y^p + 2t(1\text{-}t^2)Y^p. \tag{A6}$$

Differentiating and taking factors, this has a solution with the tax rate set at 33%. The tax reduces income in the society as a whole by 11%, but the winning coalition gains at the expense of those who are excluded. Specifically, members of the winning coalition are around 20% better off, while the excluded group is about 40% worse off.

APPENDIX B. THE EFFECT OF ETHNIC DOMINANCE

The Table B1 shows the results of a logit regression of the risk of civil conflict predicts the risk during a five year period, 1965-69, 1970-74…1995-99, on the basis of characteristics in the previous period.

[Insert Table B1 about here]

This table is reproduced from Collier and Hoeffler (2000), which provides details of method and of the data used. In column 1 ethnic dominance is defined as the share of the largest ethnic group in the population. In the remaining columns ethnic dominance is a dummy variable which takes the value unity when the share of the largest ethnic group lies within the ranges specified in the top row. As shown, the range 45-90% provides the largest and most significant coefficient. The second variable, social fractionalisation, is discussed in Appendix C. The remaining variables are the enrolment rate of males in secondary schooling, primary commodity exports as a share of GDP, population, a measure of economic growth in the previous period, a measure of the geographic dispersion of the population, and the length of time since ant previous outbreak of conflict. Collier and Hoeffler (2000) show that this specification is robust to a range of statistical tests, and that other variables, such as inequality and political rights have no significant effect.

APPENDIX C. THE EFFECT OF ETHNIC AND RELIGIOUS DIVERSITY

The Table C1 shows the effect of ethnic and religious diversity. The table is reproduced from Collier and Hoeffler (2000).

[Insert Table C1 about here]

Ethnic fractionalisation is measured by the widely used index of ethno-linguistic fractionalisation. Religious fractionalisation is an index built using the same method. Social fractionalisation is defined in three different ways. In the `baseline model' of column 1 it is measured as defined in the text: $ELF \cdot RF + \max[ELF, RF]$. In column 8 it is defined as $ELF+RF$ and in column 9 as $ELF \cdot RF$]. The other columns show that ELF and RF are not significant in any combination once social fractionalisation is included as defined in the baseline model.

Footnotes

[*] The findings, interpretations, and conclusions expressed in this paper are entirely those of the author. They do not necessarily represent the view of the World Bank, its Executive Directors, or the countries they represent. I would like to thank the editors, a referee and *Economic Policy* commentators for suggestions. I would also like to acknowledge the work of Anke Hoeffler on the regressions reported in the Appendices. Those Appendices drawn from Collier and Hoeffler (2000) are evidently joint work. The data set on civil wars has been built by Anke Hoeffler and Nick Sambanis. I have also benefited from written comments by Nat Colletta, Macartan Humphreys, and Michael Ross, and from a seminar presentation at CERDI, Universite d'Auvergne.

[1] The Baseline result in Table 2 is from Collier (2000), which discusses the sources of variables and shows that the result is robust to a range of alternative specifications and dominates any direct effects of political rights and ethnic diversity. The new sample adds eight countries for which data was not previously available. Further results available from the author show that no other size of group comes as close to being significant, and that the addition of an interaction term between this dummy variable and political rights is completely insignificant.

[2] For instance, the estimation of the capital stocks is described in Appendix IV in Collier, Hoeffler and Pattillo (1001), and Appendix I describes the production function. Hoeffler (1998) generates the country fixed effects. Taking an example, the productivity of public capital in a country with ELF = 17 is thus $0.192 + (0.487/17) = 0.221$, whereas with ELF = 77 productivity would be 0.198. Similarly, the productivity of private capital with the two different values of ELF would be 0.426 and 0.448.

[3] Empirically, Collier and Hoeffler (2000) find that the risk of conflict increases strongly in the share of primary commodity exports until the latter are around 26% of GDP, beyond which risk diminishes.

[4] There are many quirks in this database: for instance almost everybody in Ireland speaks English, yet Ireland scores moderately high at 0.25. On the other hand the widespread use of the Arabic language in the indisputably divided Lebanon has the consequence that it is recorded as having almost no diversity.

[5] Also, I don't think it is really possible to isolate the degree to which linguistic and religious cleavages coincide as is attempted.

[6] The index could also do well in predicting success in tasks such as building the tower of Babel, as it is equivalent to the probability that any two persons drawn at random from the population will prove to be from the same group.

[7] Shubik (1982). Though note that Stigler (1964) proposed the use of HH to measure ease of undetected defection from cartels.

Table 1. Ethnicity and the political process: a summary

	Ethnic fragmentation	Ethnic dominance	Homogeneity
Single-issue democracy	Similar to the median voter outcome	Fairly similar to the median voter outcome	Two parties: Median voter outcome Multiple parties: close to median voter outcome
Multi-issue democracy	Ethnic parties may reduce the economic costs of instability or log-rolling (like PR)	Stable winning coalition uses its power to choose redistribution at the expense of growth	Instability or log-rolling: both result in choice of redistribution at the expense of growth
Benevolent Dictatorship	Better or worse than democracy	Better or worse than democracy	Better or worse than democracy
Predatory Dictatorship	Strong preference for redistribution at the expense of growth	Moderate preference for redistribution at the expense of growth, identical to multi-issue democracy if the same group is in power	Mild preference for redistribution at the expense of growth

Table 2. Growth, Ethnic Composition and Political Rights

Dependent variable: per capita GDP growth, average 1960-90

	Baseline		New Sample			
Variable	coeff.	t-stat.	coeff.	t-stat.	coeff.	t-stat.
ELF*political rights	-0.005	-3.26	-0.005	-3.72	-0.005	-3.37
Dominance	-	-	-	-	-0.55	-1.33
LnGDP	-0.81	-2.67	-0.88	-3.37	-0.87	-3.35
LnPopulation growth	-0.83	-2.57	-0.98	-3.57	-0.97	-3.56
Landlocked	-0.93	-1.80	-0.90	-1.95	-0.93	-2.02
constant	8.99	3.59	9.62	4.46	9.60	4.46
F	6.27		8.47		7.18	
adjusted R^2	0.18		0.23		0.23	
n	94		102		102	

Notes: ELF*political rights = the product of ethno-linguistic fractionalization (indexed 0-100) and the Gastil index of political rights (1-7, higher values being less democratic, rescaled onto the range 0-6).
Dominance = a dummy taking the value 1 when the largest ethnic group constitutes between 45% and 60% of the population.
Ln GDP = ln of per capita GDP
Ln Population growth = ln of the rate of population growth
Landlocked = a dummy taking the value 1 if the country is landlocked.

Table 3. Interaction terms in an aggregate production function

Dependent variable: GDP (ln) averaged over the period 1980-89.

Variable	coefficient	t-statistic
Private capital stock (ln)	0.454	8.99
Private capital stock (ln)/ELF	-0.477	-1.42
Public capital stock (ln)	0.192	3.40
Public capital stock (ln)/ELF	0.487	1.45
Laborforce (ln)	0.343	10.48
Country fixed effects	1.842	9.14

n = 56
adjusted $R^2 = 0.98$

Test for joint significance of the two interaction terms:
$F(2, 49) = 2.56$; probability $> F = 0.0878$.
Test for significant difference between coefficients of the two interaction terms:
$(F1, 49) = 2.05$; probability $> F = 0.1582$.

Notes: The interaction terms divide each capital stock by ethnic diversity as measured by ELF. In principle, ELF can take the value of zero, however, in this sample the lowest value of ELF is unity. Thus, an increase in ethnic diversity lowers the value of the interaction term. A positive sign on the term thus implies that diversity reduces productivity, whereas a negative sign implies that diversity increases productivity.

Table B1. The probability of civil war as a function of different specifications of ethnic dominance

	1	2	3	4	5	6	7
	Largest group as a proportion of the total population	45-85%	45-90%	45-95%	30-90%	40-90%	50-90%
Ethnic Dominance	-1.223 (1.076)	0.695 (0.373)**	0.847 (0.370)**	0.371 (0.554)	0.752 (0.385)**	0.736 (0.374)**	0.659 (0.373)*
Social fractionalization	-0.0004 (0.0001)***	-0.0003 (0.0001)***	-0.0003 (0.0001)***	-0.0003 (0.0001)***	-0.0004 (0.0001)***	-0.0004 (0.0001)***	-0.0003 (0.0001)***
Male secondary schooling	-0.034 (0.011)***	-0.036 (0.011)***	-0.036 (0.011)***	-0.032 (0.011)***	-0.039 (0.011)***	-0.038 (0.012)***	-0.035 (0.011)***
Growth in previous period	-0.079 (0.036)**	-0.084 (0.036)**	-0.085 (0.036)**	-0.083 (0.036)**	-0.085 (0.036)**	-0.089 (0.037)**	-0.084 (0.036)**
Primary commodity exports/GDP	31.444 (8.422)***	31.351 (8.289)***	32.089 (8.375)***	30.546 (8.296)***	31.918 (8.285)***	30.802 (8.218)***	31.292 (8.265)***
(primary commodity exports/GDP)^2	-62.283 (19.037)***	-61.182 (18.712)***	-62.511 (18.964)***	-59.257 (18.837)***	-63.073 (18.656)***	-60.491 (18.433)***	-61.363 (18.776)***
ln population	0.842 (0.196)***	0.909 (0.201)***	0.946 (0.204)***	0.870 (0.196)***	0.951 (0.204)***	0.915 (0.200)***	0.907 (0.198)***
Geographic dispersion	-3.907 (1.186)***	-4.042 (1.190)***	-3.891 (1.172)***	-3.891 (1.172)***	-4.155 (1.182)***	-3.931 (1.170)***	-3.686 (1.150)***
Peace duration	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***
N	688	688	688	688	688	688	688
No of wars	43	43	43	43	43	43	43
Pseudo R^2	0.28	0.29	0.30	0.28	0.29	0.29	0.29
Log likelihood	-115.05	-113.98	-113.03	-115.45	-113.69	-113.67	-114.14

Notes: All regressions include a constant. Standard errors in parentheses. ***, **, * indicate significance at the 1, 5 and 10 percent level, respectively.

Table C1. The probability of civil war as a function of different specifications of diversity

	1	2	3	4	5	6	7	8	9
	Baseline Model	Baseline Model plus ethnic fractionalization	ethnic fractionalization only	Baseline Model plus religious fractionalization	Religious fractionalization only	Ethnic and religious fractionalization	Baseline Model plus ethnic and religious fractionalization	social frac.= ethnic plus religious fractionalization	social frac.= ethnic times religious fractionalization
social fractionalization	-0.0003 (0.0001)***	-0.004 (0.001)***		-0.0003 (0.0002)*			-0.0005 (0.0003)*	-0.014 (0.005)***	-0.0003 (0.0001)***
ethnic fractionalization		0.009 (0.010)	-0.0138 (0.007)**			-0.007 (0.007)	0.011 (0.013)		
religious fractionalization				-0.006 (0.014)	-0.026 (0.009)***	-0.023 (0.009)**	0.004 (0.018)		
ethnic dominance (45-90%)	0.847 (0.370)**	0.754 (0.381)**	0.923 (0.369)***	0.816 (0.375)**	0.773 (0.372)**	0.833 (0.379)**	0.756 (0.381)**	0.940 (0.369)***	0.847 (0.370)**
male secondary schooling	-0.036 (0.011)***	0.037 (0.012)***	-0.025 (0.001)***	-0.037 (0.012)***	-0.034 (0.011)***	-0.036 (0.113)***	-0.037 (0.116)***	-0.034 (0.011)***	-0.036 (0.011)***
(GDP growth - 3*population growth) t-1	-0.085 (0.036)**	-0.083 (0.037)**	-0.093 (0.035)***	-0.084 (0.037)**	-0.078 (0.036)**	-0.081 (0.036)**	-0.084 (0.037)**	-0.086 (0.036)**	-0.085 (0.036)**
primary commodity exports/GDP	32.089 (8.375)***	32.700 (8.425)***	23.442 (7.213)***	32.019 (8.390)***	28.368 (7.872)***	29.447 (8.060)***	32.862 (8.454)***	28.809 (8.003)***	32.147 (8.381)***
(primary commodity exports/GDP)^2	-62.511 (18.964)***	-64.283 (19.044)***	-44.962 (16.501)***	-62.791 (19.035)***	-56.891 (18.260)***	-58.464 (18.633)***	-64.450 (19.020)***	-56.049 (18.491)***	-62.621 (18.970)***
ln population	0.946 (0.204)***	0.925 (0.206)***	0.749 (0.177)***	0.941 (0.205)***	0.828 (0.186)***	0.892 (0.201)***	0.924 (0.206)***	0.904 (0.199)***	0.946 (0.204)***
geographic dispersion	-3.891 (1.172)***	-4.099 (1.201)***	-2.530 (1.042)**	-4.070 (1.242)***	-4.129 (1.222)***	-4.129 (1.230)***	-4.027 (1.245)***	-3.711 (1.163)***	-3.894 (1.172)***
peace duration	-0.004 (0.001)***	-0.0004 (0.001)***	-0.005 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***	-0.004 (0.001)***
N	688	688	668	688	688	688	688	688	688
no of wars	43	43	43	43	43	43	43	43	43
pseudo R^2	0.30	0.30	0.27	0.30	0.29	0.29	0.30	0.29	0.30
log likelihood	-113.03	-112.60	-118.56	-112.93	-114.42	-113.96	-112.57	-114.62	-113.00

Notes: All regressions include a constant. Standard errors in parentheses. ***, **, * indicate significance at the 1, 5 and 10 percent level, respectively.