Ethnic Polarization, Potential Conflict, and Civil Wars: Comment

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Abstract:
This article re-examines recent studies which argue that ethnically polarized countries increase the risk of civil war and decrease economic growth. We show that this result is an artifact of the the usage of 'incidence' rather than the 'onset' of conflict and some crucial classification decisions. Our analysis demonstrates that ethnically polarized countries do not face a substantially higher risk of violent conflict, that prominently used measures of polarization and fractionalization correlate highly with each other and that fractionalization rather than polarization seems to be negatively related to economic growth. We argue that future research on ethnic diversity has to pay closer attention to the role that institutions play. Moreover, measures of polarization should consider the degree of cohesion within competing groups, as Joan Esteban and Debraj Ray (1994) pointed out in their early article on the measurement of polarization.

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The social and political implications of ethnic diversity have received widespread attention in economics and the social sciences throughout the past decade. José G. Montalvo and Marta Reynal-Querol, henceforth MRQ, have broken new ground by arguing that polarization increases the risk of civil war and has a negative impact on the provision of public goods and the growth prospects of a country (José G Montalvo and Marta Reynal-Querol 2005, Montalvo and Reynal-Querol 2005a). We challenge both of these findings by using "onset" rather than "incidence" as a measure of the outcome variable "civil war," by classifying groups differently, and by assessing the influence of polarization on economic growth using a model developed by William Easterly and Ross Levine (1997).

To begin with, MRQ's contribution to the *American Economic Review* offered encompassing evidence that polarization increases the risk of civil war (Montalvo and Reynal-Querol 2005). In their article, MRQ first present the conceptual differences between ethnic fractionalization and polarization, introduce their own index of polarization and discuss the empirical sources which they use for the estimation of ethnic and religious diversity. Grouping their data into five-year intervals for the period from 1960 to 1999, they present strong empirical support for their hypothesis that the likelihood of civil war is largest for countries in which two equally strong ethnic groups face each other. In their view, "the weak explanatory power of ethnic heterogeneity on the incidence of civil wars found by several recent studies is due to the use of an index of fractionalization instead of an index of polarization" (Montalvo and Reynal-Querol, 2005, p.812).

In contrast to MRQ, our longitudinal analysis considers also the problem of temporal dependence that is paramount in studies of conflict (Nathaniel Beck et al. 1998). Our study does not find support for MRQ's claims. We show that the risk of civil war is not substantially higher

in ethnically polarized countries and that it is fractionalization rather than polarization that hampers economic growth.[1]

In the following, we first discuss the conceptual problems of MRQ's studies on civil war and economic growth and present our modifications. We discuss the operationalization of civil wars, the polarization measure we use, the dataset, and the model used for analyzing the impact of polarization on economic growth. Second, we present our regression results, and third, we close with some recommendations for future research.

I. Conceptual Issues

At the outset of their paper on civil war, MRQ compare the concepts of fractionalization and polarization and derive their measure. Fractionalization has recently played a key role in research on economic growth and in public economics (e.g. Easterly and Levine 1997, Alberto Alesina and Eliana La Ferrara forthcoming). Polarization has gained prominence in the field through the development of axiomatic measures by Esteban and Ray (1994) and Wolfson (1994) that have been successfully applied to the question of social conflict (Esteban and Ray 1999). Based on four straightforward axioms and on Esteban and Ray (1994), Jean Yves Duclos and colleagues (2004) develop a measure of polarization that depends on the separate contributions of alienation and identification and on their joint co-movement. This leads to a measure that is proportional to the sum of all effective antagonisms within a society (Esteban and Ray 1994: 831).

Formally, their measure of polarization for a continuous distribution F can be written as

$$P(F) = \iint f(x)^{1+\alpha} f(y)|x-y|dxdy, 0.25 \le \alpha \le 1. \quad (1)$$

This measure can also be written as the product of three components

$$P(F) = a(F)i(F,\alpha)[1+\rho], \quad (2)$$

where *a(F)* stands for average alienation and is proportional to the Gini coefficient, *i(F,α)* for average identification and ρ for the normalized covariance between identification and alienation. If the interest centers on groups of observations (like the number of individuals adhering to a particular religion) and information on intra-group cohesion is obtainable, this discrete polarization index is the most appropriate measure of any form of social, political or economic polarization.

In the absence of detailed individual-level information for a large number of countries, the polarization measure used by MRQ and originally proposed by Reynal-Querol (2002) differs from the Esteban and Ray (1994) index by considering only discrete distances (belong/not belong) between groups and by thus ignoring that the cohesion of the groups may vary. With this measure MRQ try to capture the finding by Esteban and Ray (1999) that a bimodal distribution of preferences or resources is linked to the highest level of conflict, noting that "a two-point symmetric distribution of population maximizes conflict" (Montalvo and Reynal-Querol 2005: 798).

Formally, the Reynal-Querol polarization measure (RQ) can be summarized as follows:

$$RQ = 4\sum_{i=1}^{N} \pi_i^2 (1 - \pi_i) \qquad (3)$$

where π stands for the relative size of the groups.

Empirically, MRQ rely in their construction of the polarization index on standard sources like the World Christian Encyclopedia (WCE). The MRQ classification particularly focuses on the ethnolinguistic families detailed in WCE which considers the nearness of languages and of racial, ethnic, cultural and cultural-area characteristics. Moreover, the authors rely on Tatu Vanhanen (1999) who has argued that only the most important ethnic divisions should be taken into account.

Other diversity data sets offer the advantage over the MRQ coding of being much more explicit about the criteria that form the basis for discriminating between important and less important groups. In a very comprehensive paper, James D. Fearon (2003) presents a list of 822 groups in 160 countries that had over half a million in population in 1990. Apart from language, Fearon (2003:210) includes other "criteria distinguishing groups, provided that the groups are locally understood as (primarily) descent groups and are locally viewed as socially or politically most consequential". As the Fearon data (2003) is more comprehensive than the MRQ data set with its 138 countries and unknown number of groups, we rely on his data set using the RQ polarization measure after the initial replication of the MRQ results. [2]

It should be noted that both ethnic division data sets are in general quite similar.[3] However, not all of the coding decisions by MRQ convinced us entirely. We find it for instance disputable to consider Animist religions and Syncretic cults as a category of their own, but to merge Protestants and Catholics into a single group dubbed "Christians". During the past few years, Protestantism has been rapidly expanding in Latin America and Protestants are demanding more equal treatment. Especially in Brazil, tensions between the Latin American Catholic Church and Protestants are visible (Robert Wuthnow, 1998). Furthermore, although tensions between Catholics and Protestants have generally weakened throughout the past decades in the developed world, political sociologist still consider this to be an important and newly intensified cleavage (Inglehart and Norris 2004). At least in Great Britain this religious antagonism has fuelled the violence that beset Northern Ireland from the 1960s to the end of the 1990s.

The categorization of Syncretic cults is more difficult. In general, historians of religion agree that all religions are more or less syncretistic, as Syncretism is defined as a process through which elements of one religion are assimilated into another one (Jeff Haynes, 1995, Adam Kuper and Jessica Kuper, 1996).[4] It is true, as MRQ reckon, that in Latin America a considerable part of

the population, mainly indigenous people, is affiliated with, for example, Catholicism while they are practicing what is betoken as Syncretism. But by definition the term denotes the mixing of religious elements and traditions and very often refers to the fact that the imported Christendom is adapted into a specific regional context, Hence the term emphasizes similarities rather than differences.[5] Because of these cultural adaptations and modifications, Syncretism is contested as a legitimate category among scholars of religion (Cecilia Lynch, 2000). The elusiveness of this concept pertains to the problem that people who mix elements of various religions may not do so deliberately and rarely call themselves "Syncretists" (André Droogers, 2005, Vassilis Lambropoulos, 2001).In other words, it remains unclear why we should count such cults as a separate religion.

A similar but different case is Animism. Animist groups in Africa and African religions in general have absorbed many elements from Christianity and Islam. But in contrast to Syncretism, the term "Animism" is widely used and receives a clear attribution as "belief in spiritual beings who are concerned with human affairs and capable of intervening in them" (Encyclopedia Britannica, ???). In addition, there is a higher tradition of fusing of the political and the religious in Africa. Patrick Claffey (2001) observes in this vein that African leaders generally look for legitimization within the spiritual sphere and that basic relations with the primary churches are not free of conflict. Hence, this seems to justify the incorporation of traditional religions and not Animism as a separate category.

The measures of religious polarization take the differences between "syncretism" and "Animism" into account and only considers in line with Fearon the most consequential divisions within a society. This means that we follow Fearon and divide the group "Christians" into subgroups, do not code Syncretic cults, but treat traditional religions in the case of Africa as a separate category. We can illustrate with some examples that such coding decisions are not

innocuous. Based on our definition of ethnic division, we attribute to the United Kingdom a polarization value of 0.55 instead of 0.14, as it can be found in the MRQ data set. Peru, which was shaken throughout the 1980s and 1990s by the revolt of the Marxist *Sendero Luminoso*, receives a polarization value of 0.36 instead of 0.88.[6]

Another conceptual issue of foremost importance is the coding of the dependent variable. MRQ's focus on the "incidence" of conflict, which is in sharp contrast to the overwhelming majority of current studies on the causes of civil war, like the prominent contributions by political scientists James D. Fearon and David D. Laitin (2003) and economists Paul Collier and Anke Hoeffler (2004). They all work with the "onset" of civil wars, and there is good reason to do so. Studying interstate wars, Beck (2003) points out that the use of "onset" rather than "incidence" is not just a matter of taste. First, the factors that contribute to the launching of a social conflict might not necessarily be the same as the ones that keep feeding it. Second, the risk that a civil war continues is much higher than the one of a war outbreak. To resolve this problem, Beck (2003:171) recommends that the model specification should contain variables that "would allow the probability of a dispute to be vastly higher if it immediately follows a previous year with a dispute." Other escape routes that Beck recommends are the usage of transition models or the reliance on event history models.

In the context of intrastate wars, Ibrahim Elbadawi and Nicholas Sambanis (2000) make a similar point and distinguish between onset and duration of civil wars. Patrick Brandt and colleagues (2005) argue that the study of duration of civil wars is concerned with the subset of countries that already have fallen victim to a conflict outbreak. Thus, it is unreasonable to expect the same characteristics that contributed to the conditional probability of conflict onset to explain the different outcomes of civil war duration as there should be less variance in those variables.

We address these discussions by using both specifications of the dependent variable, the one MRQ used and the one predominantly employed in other conflict studies. With respect to time dependence, we will heed Beck's second advice and use an event-history approach after assessing the risk of civil war with the help of yearly data and by controlling for dynamics. Event history models are appropriate in this case because we think it is more natural to understand war as a sickness to which a country might fall victim at a single point of time rather than repeatedly, like the models by MRQ implicitly suggest. We opted for this country-year frame also because most covariates used in MRQ are available at this level of temporal aggregation and fractionalization and polarization measures are almost time invariant.

To underline the importance of their findings, MRQ (2005) refer to another article (Montalvo and Reynal-Querol, 2005a) where they establish an indirect negative influence of ethnic polarization on growth via the positive impact of this factor on civil war. Therefore, as a last test we check oder reexamine this finding using as the base line model the seminal study of Easterly and Levine (1997) on how fractionalization undermines economic growth. We add to their setup our indices for ethnic and religious fractionalization and polarization.

In the following, we present the results of our estimations.

II. Regression Results

This section reports the results that we obtained from our re-analysis of MRQ. This means that we control for the influence of the same covariates (GDP per capita, population size, primary commodity export, percentage of mountainous terrain in a country, noncontiguous states, democracy, and data on ethnic and religious divisions) on civil war. The appendix to this article summarizes the operational definitions and the sources of the data.

Columns (1) and (4) of Table 1 display the published logit estimates from MRQ for the cases of ethnic and religious divisions and their impact on the incidence of civil war. Due to missing data, only 117 countries out of their data set of 138 are included in the estimation. . In the case of the diversity indicators they find that ethnic polarization outperforms ethnic fractionalization, whereas the religious variables are only significant when introduced jointly in the equation. What the authors do not mention is that the correlation between these indices amounts to the problematic level 0.95.[7] The corresponding figure for the measures of ethnic diversity is 0.61.[8] As it is hard to differentiate between fractionalization and polarization empirically, we argue in another paper that it is more appropriate to use a dummy variable that captures only the cases of very high polarization (Schneider and Wiesehomeier, 2005). In order to be as closely as possible to their AER publication, in the followingwe will adopt MRQ's specification.[9]

-TABLE 1 about here-

In the regressions using the onset of civil war, Israel and Myanmar are dropped as the conflicts in those countries began before the time period under consideration, i.e. before 1960. Columns (2) and (5) use the same data source as MRQ for the measurement of the dependent variable, namely the Uppsala/PRIO conflict data set, but coded as the onset and not the incidence of civil war.[10] If we avoid the double counting of conflicts that span more than one period, the impact of ethnic polarization on the risk of war shrinks and looses its statistical significance.[11] Religious polarization also stops to exert a significant effect on the risk of war once we move, to the lower conflict threshold of 25 battle deaths per year, as shown in columns (3) and (6),. In accordance

with Collier and Hoeffler (2004, but see Fearon (2005)), primary commodity exports fan civil war onset as poverty and population size do.

Again, our logit regressions using country-year data follow the MRQ research design as closely as possible (see Appendix) with the addition that we control for time dependence between observations. To do so, we adopt the solution presented by Beck et al. (1998) and account for temporal dependence. We add a variable that counts the years of peace that a country experienced until a war broke out and also include three natural cubic splines to the regression. Admittedly, censoring the consecutive conflict years by focusing on onset rather than incidence reduces the serial correlation between cases. It does, however, not reduce the dependence over time between the observations of peace.[12] Because we rely on Fearon's (2003) encompassing data set in this second set of tests, the analysis now covers 160 countries of which 132 in the case of ethnic diversity and 134 in the case of religious diversity are included.

- TABLE 2 about here-

Columns (1) and (4) follow the logic of MRQ and estimate a regression using civil war incidence as a dependent variable. Again, ethnic polarization outperforms ethnic fractionalization as an explanatory variable even though we now use the polarization measure based on Fearon (2003). Note that the religious polarization and fractionalization indices, which are also based on Fearon, are far from reaching statistical significance. The dummy for democracy shows only in this model specification a significant negative influence on the incidence of civil war.

In the regressions using onset, Israel and Myanmar are dropped again. Changing the dependent variable in columns (2) and (5) results in the same findings as before – neither ethnic nor religious polarization have a significant effect on the probability of civil war onset. The

interesting case occurs when we use our alternative definition of civil war onset. In column (3) the polarization measure displays a significant and positive impact on the onset of minor armed conflict although the coefficient is only half the size of the one reported by MRQ using incidence. This is basically driven by two factors. First, our extended sample includes highly polarized countries that experienced a civil war and are not included in the MRQ dataset (e.g. Djibouti, Eritrea, Laos, and Lebanon). Additionally, lowering the threshold for civil wars results in a substantially larger number of onsets. Bolivia, Chile, Malaysia, Niger, and Spain are all countries that experienced this sort of low-level civil wars.[13] The result suggests that not only model specification matters, but also the definition of conflict, although this specification does not make a difference in the case of religious diversity (column 6).

Finally, we estimate the risk of civil war with the help of event history models. The starting period is 1960 or the year when a country became independent. Note that the data set includes delayed entries and, for some countries, multiple war onsets. We use exponential proportional hazard models, a standard technique that assumes that the risk of a war onset given the covariates remains constant.[14] Additionally, we use the incidence of minor armed conflicts as dependent variable in models 3 and 7. The results shown in Table 3 exhibit the same pattern as described for the logit models in Table 2.

- TABLE 3 about here -

The results of our survival models confirm our earlier findings. When incidence is used as the dependent variable, ethnic polarization exhibits a significant and positive impact on civil war, whereas ethnic fractionalization does not (columns 1 and 3). Yet, an increase in the probability of onset only can be observed for the conflict indicator that includes smaller civil wars (columns 2

and 4).[15] Religious heterogeneity does not matter as an explanatory variable, nor do any of the control variables reach conventional levels significance. This demonstrates that the debate over which form of diversity affects the risk or magnitude of war is not yet settled. In an independent study, Bethany Lacina (2006) shows, using a dichotomous measure of polarization, that polarized societies experience less rather than more severe civil conflicts measured by the number of battle deaths.

-TABLE 4 about here-

Regarding the influence of ethnic polarization on economic growth our re-estimations presented here suggest additional ambiguities that the future study of diversity has to take into account. The data set used for our analysis consists of 160 countries for which we estimate the average annual growth rate of GDP per capita per decade by controlling with dummy variables for the single decades (1960, 1970, 1980); (for details see Easterly and Levine, 1997). In accordance with Easterly and Levine, we employ seemingly unrelated regression.[16] Due to their high correlation, we do not introduce religious polarization and fractionalization together into the growth regressions.

We are able to replicate the Easterly and Levine results almost one to one although there are minor differences in the magnitude of the estimated coefficients. The most striking difference is that the dummy for Sub-Saharan Africa is in almost all models statistically insignificant. Furthermore, the variable for the average educational attainment, the log of schooling, is significant in the models containing what Easterly and Levine call policy variables, i.e. in the models (3), (4), (7) and (8). Contrary to the findings of the authors, but in accordance with other contributions, the indicator for financial depth exhibits always a significant and positive influence

on long-run growth. In agreement with the original study, ethnic fractionalization exerts always a negative influence on growth. Interestingly, the effect of ethnic polarization is the opposite way around. This means in contrast to Montalvo and Reynal-Querol (2005a) that extreme ethnic tensions translate into increased rather than decreased economic growth.

In the models containing the so-called policy variables, the magnitude of the ethnic polarization and fractionalization coefficients rises. Polarization becomes highly significant, no matter whether religious fractionalization or religious polarization is added. The latter variable exerts a significant and positive influence only in the model that includes the proxy variable for public policy, an indicator that counts telephones per worker, a result that confirms findings of Alesina et al. (2003) [17]

III. Concluding remarks

Speculations over the impact of ethnic and religious diversity on the risk of violent conflict abound since the publication of Donald L. Horowitz (1985) examination of "Ethnic Groups in Conflict" and Samuel P. Huntington´s (1997) essay on the "Clash of Civilizations". One possibility to think about this question analytically is by using the concept of polarization. As the rapidly growing theoretical literature suggests, there are strong theoretical reasons to believe that high levels of polarization rather than fractionalization increase the risk of conflict.

This comment has re-analyzed the most sophisticated examination that tries to find empirical evidence for the conflict-through-polarization conjecture (Montalvo and Reynal-Querol 2005). Although we have followed their study as closely as possible, we have been unable to confirm their findings when correcting for several methodological limitations. Our evaluation has shown that the MRQ results crucially hinge upon the usage of "incidence" rather than "onset" of civil war as a dependent variable. Relying on an inappropriate research design, their AER article

confirmed the well-known finding that diversity – be it in the form of "polarization" or "fractionalization" – is a significant determinant of war duration. Yet, as this study shows, it is, not a cause of armed violence. Our analysis has further shown that the MRQ results are inflated through some coding decisions that attribute high levels of polarization to some countries that have experienced a civil war. Moreover, we have been also unable to find the negative effect that polarization exerts, according to Montalvo and Reynal-Querol (2005a), on economic growth.

Future studies should use refined measures of polarization that truly differentiate this concept from fractionalization on the empirical level. Although we have ample reason to believe that polarization increases the risk of various forms of violence (Esteban and Ray 1999), we also need to look more carefully into the role that political institutions play in this context (Reynal-Querol, 2005, Gerald Schneider and Nina Wiesehomeier, 2005). Political sociologists have recognized since a long time that institutions are partly a response to social divisions. Yet, the rules that guide the interactions between competing groups are not completely determined by the social fabric, but are able to exert an impact on social relations on their own. In democratic regimes, the structure of party systems is of utmost importance (Schneider and Wiesehomeier 2005).

APPENDIX: DEFINITION OF THE VARIABLES

Except the variable for the onset of civil war, all variables from Table 1 are taken from MRQ`s original dataset (see Montalvo and Reynal-Querol, 2005 for details). Tables 2 and 3 put the MRQ study within a country-year framing and use as much as possible a replication of MRQ's data (for details, see below). Table 4 uses original data from Easterly and Levine (1997) (see there for detailed explanations) with additional information on ethnic and religious divisions.

PrioCW: Our analysis focuses on internal and internationalized internal conflicts and is thus limited to disputes that are located in the country of reference (type 3 and 4). We generated a dichotomous variable, i.e. the conflict indicator is 1 if the incompatibility results in at least 25 battle-related deaths per year and an accumulated total of at least 1,000 deaths. This is equivalent to the intermediate armed conflict and war definition of the Uppsala/PRIO armed conflict data set (Nils Peter Gleditsch et al., 2002).

PrioCW_onset: This is the same as PrioCW, only that we drop all the subsequent years of an ongoing conflict to capture the onset of civil war.

Intwar_25: Definition of minor armed conflict of the Uppsala/PRIO armed conflict data set. Again we concentrate on type 3 and 4 incompatibilities. The dummy variable is 1 if the threshold of 25 battle-related deaths has been crossed for the first time and 0 if no internal civil war has started in the year under consideration.

Onset_25: Same as Intwar_25, but again, we drop all the subsequent years of an ongoing conflict.

Income: GDP/pop based on pwt5.6, wdi2001, cow energy data. Source: Fearon and Laitin (2003). To avoid systematic missings, we extrapolated the year 2000 where appropriate.

Population: Country-year population. Source: Fearon and Laitin (2003). To avoid systematic missings, we extrapolated the years 1999 and 2000 where appropriate (if at least eight consecutive country years of observations before 1999 have been available)

Sxp: Primary commodity exports as proportion of GDP. Country-year version of the Collier and Hoeffler data (2000, 2004) taken from Fearon (2005).

Mountains: Estimated percentage of mountainous terrain based on the on work by the geographer A. J. Gerard for the World Bank's "Economics of Civil War, Crime,and Violence" project. Fearon and Laitin add to this list twenty-two countries. Source: Fearon and Laitin (2003).

Noncontinguous state: This refers to countries with territory holding at least 10 000 people and

separated from the land area containing the capital city either by land or by 100 kilometers of water. Source: Fearon and Laitin (2003)

Democracy: General openness of the political institutions (0= low, 10= high) from the Polity IV dataset. As well as MRQ we construct a dummy variable that takes the value 1 if the score is higher or equal to 4.

Ethnic Fractionalization: We use a measure from Fearon (2003) who relied on the Encyclopedia Britannica, the CIA's World Factbook and other sources. The fractionalization index ranges from 0 to 1; we updated the year 2000.

Ethnic Polarization: Our ethnic polarization measure based on a list about ethnic groups per country from Fearon (2003) was calculated with the formula originally proposed by Reynal-Querol (2002) and also presented in Reynal-Querol (2005) and Montalvo and Reynal-Querol (2005).

Religious Fractionalization: We use a measure from Fearon (2003). The fractionalization index ranges from 0 to 1; we updated the year 2000.

Religious Polarization: Our measure is based on data about religious groups per country kindly provided by James. D. Fearon. R. Quinn Mecham used the CIA Factbook and several other sources to construct a list of adherents per country. Our measure was calculated with the formula originally proposed by Reynal-Querol (2002) and also presented in Reynal-Querol (2005) and Montalvo and Reynal-Querol (2005).

REFERENCES

Alesina, Alberto, Devleeschauwer, Arnaud, Easterly, William, Kurlat Sergio and Wacziarg Romain. **"Fractionalization."** ***Journal of Economic Growth*****, 2003, *8* (2), pp. 155-194.**

Alesina, Alberto and La Ferrara, Eliana. "Ethnic Diversity and Economic Performance." *Journal of Economic Literature* (forthcoming).

Beck, Nathaniel "Modeling Dynamics in the Study of Conflict: A Comment on Oneal and Russett," in Gerald Schneider, Katherine Barbieri and Nils Petter Gleditsch, eds., *Globalization and Armed Conflict*. Lanham: Rowman and Littlefield, 2003, pp. 165-177..

Beck, Nathaniel , Katz, Jonathan N. and Tucker, Richard. "Taking Time Seriously: Time-Series-Cross-Section Analysis with a Binary Dependent Variable." *American Journal of Political Science*, 1998, *42* (4), pp.1260-1288.

Brandt, Patrick, Manson, David, Gurses, Mehmet, Petrovski, Nicolai, and Radin, Dasha. "When and How the Fighting Stops: Explaining the Duration and Outcome of Civil Wars." Unpublished Paper, 2006

Collier, Paul and Hoeffler, Anke. "Greed and Grievance in Civil War." *Oxford Economic Papers*, 2004, *56* (4), pp. 563-95.

Droogers, André. "Syncretism and Fundamentalism: A Comparison" *Social Compass*, 2005, 52(4), pp. 463-471.

Duclos, Jean Yves, Esteban, Joan and Ray, Debraj. "Polarization: Concepts, Measurement, Estimation." *Econometrica*, 2004, *72* (6), pp. 1737-72.

Elbadawi, Ibrahim and Sambanis, Nicholas. "How much war will we see? Explaining the Prevalence of Civil War." *Journal of Conflict Resolution*, 2002, *46* (3), pp. 307-334.

Esteban, Joan and Ray, Debraj. "On the measurement of polarization." *Econometrica*, 1994, *62* (4), pp. 819-51.

Esteban, Joan and Ray, Debraj. "Conflict and Distribution." *Journal of Economic Theory*, 1999, *87* (2), pp. 379-415.

Easterly, William and Levine, Ross. "Africa's Growth Tragedy: Policies and Ethnic Divisions." *Quarterly Journal of Economics*, 1997, *112* (4), pp. 1203-50.

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

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

Fearon, James D. and Laitin, David D. "Ethnicity, Insurgency, and Civil War." *American Political Science Review*, 2003, *97* (1), pp.75-90.

Gleditsch, Nils Petter, Wallensteen, Peter, Eriksson, Mikael, Sollenber, Margareta, Strand, Hegre, Håvard. "Armed Conflict 1946-2001: A New Dataset." *Journal of Peace Research*, 2002, *39* (5), pp. 615-37.

Greenfield, Sidney M. "The reinterpretation of Africa: Convergence and Syncretism in Brazilian Candomble" in Greenfield , Sidney M. and André Droogers (eds.) *Reinventing Religions: Syncretism and Transformation in Africa and the Americas*, Lanham, MD: Rowman and Littlefield, 2001, pp. 113-118.Haynes, Jeff. "Religion, Fundamentalism, and Ethnicity. A Global Perspective." *UNRISD Discussion Paper 65*, 1995.

Herskovits, Melville. *The Myth of the Negro Past*. Boston: Beacon, 1958.

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

Huntington, Samuel P. *The Clash of Civilizations and the Remaking of the World Order*. New York: Simon & Schuster, 1997.

Inglehart, Ronald and Norris, Pippa *Sacred and Secular. Religion and Politics Worldwide*. New York: Cambridge University Press, 2004.

King, Gary and Zeng, Langche. "Logistic Regression in Rare Events." *Political Analysis,* 2001, *9* (2), pp. 137-163.

Kuper, Adam and Kuper, Jessica, **eds**. *The Social Science Encyclopedia*. Vol. 2. London: Routledge, 1996.

Lacina, Bethany. "Explaining the Severity of Civil Wars." *Journal of Conflict Resolution,* 2006, *50* (2), pp. 276-289,

Lambropoulos, Vassilis. "Syncretism as Mixture and as Method." *Journal of Modern Greek Studies*, 2001, 19, pp. 221-235

Lynch, Cecilia. "Dogma, Praxis, and Religious Perspectives on Multiculturalism" *Millenium: Journal of International Studies,* 2000, 29(3), pp. 741-759.

McDowell, Allen. "From the help desk: Seemingly unrelated regression with unbalanced equations." *The Stata Journal,* 2004, *4* (4), pp.442-48.

Montalvo, José G. and Reynal-Querol, Marta. "Ethnic Polarization, Potential Conflict, and Civil Wars." *American Economic Review*, 2005, *95* (3), pp.796-813.

Montalvo, José G. and Reynal-Querol, Marta. "Ethnic diversity and economic development." *Journal of Development Economics*, 2005a, *76* (2), pp.293-323.

Reynal-Querol, Marta. "Ethnicity, Political Systems, and Civil Wars." *Journal of Conflict Resolution*, 2002, *46* (1), pp.29-54.

Reynal-Querol, Marta. "Does Democracy Preempt Civil Wars?." *European Journal of Political* Economy, 2005, *21* (2), pp.445-65.

Schneider, Gerald and Wiesehomeier, Nina. "Rules that Matter. Political Institutions and the Polarization-Conflict Nexus." Unpublished Paper, 2005.

Schneider, Gerald. "The Ills of Polarization**."** Unpublished Paper, 2006**.**

Vanhanen, Tatu. "Domestic Ethnic Conflict and Ethnic Nepotism: A Comparative Analysis." *Journal of Peace Research*, 1999, *36* (1), pp.55-73.

Wuthnow, Robert, **ed**. *The Encyclopedia of Politics and Religion*. Vol. 1.. London: Routledge, 1998.

Tables

TABLE 1 – Civil War, Fractionalization and Polarization (Five-Year Periods)

	Published			*Published*		
	(1)	(2)	(3)	(4)	(5)	(6)
	PRIOcw	PrioCW_onset	onset_25	PRIOcw	PrioCW_onset	onset_25
LGDPC	-0.419*	-0.194	-0.497***	-0.328	-0.265	-0.664***
	(0.235)	(0.268)	(0.162)	(0.291)	(0.237)	(0.149)
LPOP	0.399**	0.409**	0.259**	0.438***	0.496***	0.337***
	(0.181)	(0.160)	(0.124)	(0.146)	(0.138)	(0.105)
PRIMEXP	-1.073	0.302	1.614*	-0.354	0.965	2.416**
	(1.867)	(1.377)	(0.940)	(1.713)	(1.410)	(0.942)
MOUNTAINS	-0.002	0.001	0.008	0.002	0.002	0.006
	(0.009)	(0.012)	(0.005)	(0.009)	(0.010)	(0.004)
NONCONT	0.290	0.231	0.616*	0.308	0.278	0.656*
	(0.597)	(0.524)	(0.351)	(0.625)	(0.532)	(0.390)
DEMOCRACY	0.034	-0.325	-0.076	0.017	-0.356	-0.045
	(0.365)	(0.473)	(0.283)	(0.362)	(0.484)	(0.284)
ETHPOL	2.289**	0.881	0.852	-	-	-
	(1.026)	(1.054)	(0.742)			
ETHFRAC	0.178	0.867	0.560	-	-	-
	(0.916)	(1.054)	(0.720)			
RELPOL	-	-	-	3.903**	2.907*	1.488
				(1.983)	(1.707)	(1.313)
RELFRAC	-	-	-	-4.972*	-4.131	-2.855
				(3.008)	(2.715)	(2.014)
Constant	-6.299**	-8.880**	-3.345	-6.897**	-9.155***	-2.574
	(3.140)	(3.493)	(2.244)	(3.047)	(3.287)	(2.141)
Observations	846	787	760	846	787	760
Number of countries	117	115	115	117	115	115
Pseudo R2	0.122	0.0902	0.0853	0.110	0.0881	0.0817

NOTE: Logit models with either civil war incidence or onset as the dependent variable and country five-year periods as observations. Income and population are lagged one year; robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

TABLE 2 – Civil War, Fractionalization and Polarization (One Year Periods, Logit regressions)

	(1) PrioCW	(2) PrioCW_onset	(3) Onset_25	(4) PrioCW	(5) PrioCW_onset	(6) Onset_25
GDP	-0.040	-0.350	-0.400***	0.067	-0.313	-0.462***
	(0.158)	(0.226)	(0.126)	(0.159)	(0.198)	(0.123)
Population	0.379***	0.379***	0.290***	0.325***	0.348***	0.260***
	(0.094)	(0.103)	(0.078)	(0.104)	(0.117)	(0.092)
sxp	-2.005*	0.122	0.299	-1.879	0.247	0.871
	(1.205)	(1.173)	(0.867)	(1.165)	(1.183)	(0.799)
Mountains	0.005	0.002	0.003	0.008	0.003	0.003
	(0.005)	(0.007)	(0.004)	(0.005)	(0.006)	(0.004)
Noncont	0.248	0.286	0.214	0.187	0.289	0.254
	(0.383)	(0.435)	(0.269)	(0.388)	(0.438)	(0.279)
Democracy	-0.457*	-0.457	-0.185	-0.538**	-0.495	-0.160
	(0.261)	(0.327)	(0.235)	(0.269)	(0.337)	(0.231)
Ethnic Pol. (Fearon)	1.849***	1.057	1.050**	-	-	-
	(0.701)	(0.754)	(0.524)			
Ethnic Fract. (Fearon)	-0.195	-0.043	0.379	-	-	-
	(0.665)	(0.850)	(0.538)			
Religious Pol. (Fearon)	-	-	-	1.178	1.028	-0.296
				(0.946)	(1.274)	(0.757)
Religious Fract. (Fearon)	-	-	-	-1.649	-1.272	-0.112
				(1.269)	(1.784)	(1.016)
Constant	-2.337	-5.958**	-4.238***	-1.678	-5.502***	-2.531*
	(1.452)	(2.363)	(1.302)	(1.461)	(2.062)	(1.321)
Observations	4999	4414	4233	5048	4459	4271
N° of countries	132	130	130	134	132	132
Pseudo R2	0.695	0.0973	0.0882	0.691	0.0926	0.0792

NOTE: Logit models with either civil war incidence or onset as the dependent variable and country years as observations. Income and population are used with their natural logarithm and lagged one year. We account for duration dependence using peace-years correction and three natural cubic splines calculated with the program BTSCS Data Analysis Utility Version 4.0.4 (Tucker, 1999). The results for these variables are not shown. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

TABLE 3 – Civil War, Fractionalization and Polarization (Single Years, Exponential Survival Regressions)

	(1) PrioCW	(2) PrioCW_onset	(3) Intwar_25	(4) Onset_25	(5) PrioCW	(6) PrioCW_onset	(7) Intwar_25	(8) Onset_25
GDP	0.641**	0.681**	0.622***	0.690***	0.695*	0.705**	0.629***	0.640***
(Fearon)	(0.138)	(0.128)	(0.102)	(0.077)	(0.130)	(0.109)	(0.089)	(0.063)
Population	1.344***	1.401***	1.337***	1.236***	1.280**	1.372***	1.285***	1.210**
(Fearon)	(0.142)	(0.146)	(0.112)	(0.091)	(0.135)	(0.154)	(0.113)	(0.095)
sxp	0.259	1.047	0.347	1.326	0.416	1.113	0.734	2.261
	(0.460)	(1.158)	(0.442)	(1.113)	(0.679)	(1.306)	(0.837)	(1.799)
Noncont	1.355	1.200	1.434	0.985	1.255	1.195	1.425	1.036
	(0.602)	(0.442)	(0.498)	(0.260)	(0.574)	(0.452)	(0.488)	(0.276)
Democracy	0.880	0.648	1.060	0.858	0.831	0.629	1.054	0.892
	(0.233)	(0.206)	(0.218)	(0.188)	(0.222)	(0.205)	(0.218)	(0.193)
Mountains	1.002	0.999	1.002	1.000	1.005	0.999	1.005	1.001
	(0.006)	(0.006)	(0.005)	(0.004)	(0.006)	(0.006)	(0.005)	(0.003)
Ethnic Fract.	0.619	0.955	0.919	1.408	-	-	-	-
(Fearon)	(0.563)	(0.788)	(0.685)	(0.700)				
Ethnic Pol.	10.229***	2.018	6.653***	2.189	4.743	2.576	2.682	0.609
(Fearon)	(8.028)	(1.488)	(4.462)	(1.061)	(6.561)	(3.111)	(2.807)	(0.436)
Rel. Pol.	-	-	-	-	0.135	0.384	0.261	1.314
(Fearon)					(0.254)	(0.652)	(0.361)	(1.273)
Observations	4984	4984	4984	4984	5033	5033	5033	5033
N° of countries	132	132	132	132	134	134	134	134
N° of failure	651	71	902	142	655	71	916	145
LR chi2	44.57	56.81	77.99	79.23	27.90	37.51	46.43	52.37
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NOTE: Coefficients in the table are estimated using exponential survival regression and report the estimated multiplicative effect of a one-unit change in the independent variable on the mean time until failure (Hazard ratios). Income and population are used with their natural logarithm. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

TABLE 4 – Fractionalization, Polarization and Economic Development (Pooled Decades)

	(1) gyp	(2) gyp	(3) gyp	(4) gyp	(5) gyp	(6) gyp	(7) gyp	(8) gyp
Dummy 1960s	-0.066	-0.090	-0.099	-0.084	-0.081	-0.107	-0.117	-0.113
	(0.092)	(0.093)	(0.109)	(0.111)	(0.092)	(0.093)	(0.108)	(0.109)
Dummy 1970s	-0.069	-0.092	-0.096	-0.078	-0.084	-0.109	-0.113	-0.107
	(0.092)	(0.093)	(0.109)	(0.110)	(0.092)	(0.093)	(0.108)	(0.109)
Dummy 1980s	-0.088	-0.112	-0.112	-0.094	-0.103	-0.128	-0.129	-0.122
	(0.092)	(0.093)	(0.109)	(0.110)	(0.092)	(0.093)	(0.108)	(0.109)
Dummy SSA	-0.006	-0.007	-0.005	-0.010	-0.009	-0.011*	-0.008	-0.014**
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Dummy Latin	-0.019***	-0.019***	-0.014***	-0.017***	-0.019***	-0.018***	-0.013***	-0.016***
America/Carrib	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Log of initial	0.030	0.037	0.045	0.050*	0.034	0.041*	0.049*	0.057**
income	(0.024)	(0.024)	(0.028)	(0.028)	(0.024)	(0.024)	(0.028)	(0.028)
Log of initial	-0.002	-0.003*	-0.004**	-0.005***	-0.003*	-0.003**	-0.004**	-0.006***
income 2	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Log of	0.012***	0.012***	0.013***	0.009*	0.011**	0.011***	0.012***	0.008*
schooling	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)
Assassinations	-	-24.631**	-25.208***	-29.581***	-	-26.986**	-26.879***	-31.554***
		(10.512)	(9.486)	(8.904)		(10.568)	(9.450)	(8.831)
Financial depth	-	-	0.023***	0.019**	-	-	0.023***	0.019**
			(0.008)	(0.008)			(0.008)	(0.007)
Black market	-	-	-0.021***	-0.020***	-	-	-0.022***	-0.020***
premium			(0.004)	(0.004)			(0.004)	(0.004)
Fiscal surplus/	-	-	0.077**	0.166***	-	-	0.082***	0.172***
GDP			(0.031)	(0.036)			(0.031)	(0.036)
Log telephones	-	-	-	0.010***	-	-	-	0.010***
per worker				(0.003)				(0.003)
Ethnic Fract.	-0.025**	-0.028***	-0.045***	-0.045***	-0.027***	-0.030***	-0.044***	-0.043***
(Fearon)	(0.010)	(0.010)	(0.012)	(0.012)	(0.010)	(0.010)	(0.012)	(0.012)
Ethnic Pol.	0.008	0.012	0.028***	0.036***	0.008	0.011	0.026***	0.034***
(Fearon)	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)
Rel. Fract.	-0.009	-0.005	0.004	0.001	-	-	-	-
(Fearon)	(0.008)	(0.008)	(0.009)	(0.008)				
Rel. Pol.	-	-	-	-	0.003	0.006	0.011	0.011*
(Fearon)					(0.007)	(0.007)	(0.007)	(0.006)
Observations	253	250	183	169	253	250	183	169
Number of id	92	92	76	71	92	92	76	71
Wald chi2	242.1	251.9	278.8	383.3	238.6	252.0	287.8	399.7
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NOTE: Growth Regressions: Pooled Decades (1960s, 1970s, 1980s). Estimated using xtgee in Stata for Seemingly Unrelated Regression with unbalanced equations: a separate regression for each period. Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Notes

[1] We cross-checked our logit models in two ways. First, we used the *relogit* command in Stata to control for the rare event character of very violent wars (see King and Zeng (2001)). Second, we relied on generalized estimation equations (GEE) with a binomial distribution and a one-year time lag for the autocorrelation structure. To reassess the results from our exponential survival regression, we also estimated semiparametric cox proportional hazard models with GDP and Population as time-varying covariates. The results did not differ substantively from those reported here and are available upon request. Additionally, for all our models and robustness checks we used fractionalization and polarization measures based on the data of Alesina et al (2003). In MRQ (2005), the others are able to confirm their results using the Alesina data. In contrast to the authors we have not been able to replicate their results from table 1 when using the Alesina data. As we do not know which individual groups MRQ include in their measures, we are not able to assert the exact differences. When the Alesina data is used, polarization never exhibits a significant positive impact on civil war, whatever specification of the dependent variable we use. However, the ethnic diversity measures based on Alesina show the same relationship for the growth regressions as our indices based on Fearon. Generally, our measures based on Fearon and Alesina have a higher correlation with each other than the respective indices exert with the MRQ measures.

[2] Relying on this data set, we are able to find the same empirical relationship between our measures of polarization and fractionalization as MRQ. For the sake of brevity, these figures are not included.

[3] The correlation between our ethnic polarization measure and the one used by MRQ is 0.8, the correlation between our ethnic fractionalization measure and the MRQ indicator reaches the same level.

[4] Melville Herskovits even considered syncretism as a concept for specifying the degree to which diverse cultures have integrated (Herskovits, 1958).

[5] For Brazilian Candombles, Sidney Greenfield (2001: 116) reasons that there has been "convergence of significant aspects of Yoruba beliefs and practices and the Roman Catholicism of Luso-Brazilians".

[6] Because the codings of religions differ, the correlation between our measures of religious fractionalization and polarization and those of MRQ are in both cases only around 0.5.

[7] In the case of the religious measures the authors do consider this problem in Montalvo and Reynal-Querol (2005a) and use these indices separately, whereas in Montalvo and Reynal-Querol (2005) they do not. Alesina et al (2003) already hint at this problem in their article and ascertain that the polarization index works best when highly correlated with the fractionalization measure.

[8] Our ethnic fractionalization and the ethnic polarization index based on Fearon exhibit a correlation of 0.65, our religious fractionalization and religious polarization measures one of 0.88.

[9] We reestimated all models using our dummy specifications of ethnic and religious polarization together with ethnic and religious fractionalization respectively. Also, we introduced the polarization and fractionalization indices separately. The results did not change substantially, but the coefficients usually lost in magnitude.

[10] There are minor deviations, as we use a more recent version of this data set (Version 3.0) than MRQ (Version unknown). The correlation of our variable for the incidence of civil war, on which the onset variable is based, with the one of MRQ is 0.93.

[11] Fearon (2005) hints at the problem that dropping periods of ongoing war is artificially increasing the mean of the dependent variable and proposes as a "natural alternative" to code them as zeros. Applying this approach to all our replication models (including those in Table 1) does not affect our results substantially.

[12] Beck, Katz and Tucker have constructed an algorithm that can be used in this context. It is downloadable from www.vanderbilt.edu/~rtucker/program/btscs. The splines are tied together at certain knots, which we place at the years 1, 4, and 7 following the suggestion from Beck, Katz, and Tucker (1998). A significance test of the cubic splines indicates the need to correct for duration dependence.

[13] Likewise, this pattern persisted with our dummy variable of ethnic polarization. In the case of minor armed conflict, the variable always had a positive, statistically significant influence on the onset of civil war.

[14] As mentioned above, we also used the less restrictive semiparametric cox proportional hazard model.

[15] The event history models using onset, include the cases of Israel and Myanmar, treating them as censored cases.

[16] Since in Stata the command for seemingly unrelated regression is not suitable for estimation with unbalanced equations, thus resulting in loss of information, we use the xtgee command with a Gaussian family, an identity link, and an unstructured within-group correlation structure (McDowell, 2004).

[17] This pattern stays the same if we use our dummy variables for polarization.