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THE POLITICAL ECONOMY OF SECESSIONISM: INEQUALITY, IDENTITY, AND THE STATE

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Graham K. Brown

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Abstract

The econometric study of civil war is increasing recognized to suffer from problems of 'over-aggregation'. As such, there is a high risk of estimation biases, ecological fallacies, and endogeneity problems. In this paper, I seek to contribute to the disaggregation of the study of civil war by focusing on the socio-economic dynamics of secessionist conflict as an identifiably distinct subset of 'civil wars', and by using a new subnational dataset compiled for this purpose. I test a series of hypotheses relating to the socio-economic conditions that encourage secessionism and political institutions that might mediate it. In contrast to the mainstream literature on civil war, I find a very strong predictive role for a measure of ethnic diversity in accounting for the incidence of secession. I also find a relatively straightforward set of socio-economic relationships. The relationship between relative socio-economic performance and conflict incidence is non-linear: regions that suffer from high 'horizontal inequalities'—whether relatively poor or relatively rich—in relation to the rest of the country are more prone to secessionism. The presence of hydrocarbon deposits also dramatically increases the likelihood of secessionism. But the institutional story is more complex and contingent upon interaction effect with the degree of ethnic diversity and the level of horizontal inequality.

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1 Introduction

The econometric study of civil war is increasing recognized to suffer from problems of 'over-aggregation' (Buhaug and Rød 2005; Kalyvas 2008). Country-level datasets, often constructed from other "off-the-shelf" (Kalyvas 2008: p.404) variables, such as those in the World Development Indicators, are entered into regression models that suffer from problematic issues of event, time, and geographical interdependence (Box-Steffensmeier, et al. 2005; Gleditsch 2007). As such, there is a high risk of estimation biases, ecological fallacies, and endogeneity problems. In this article, I seek to contribute to the disaggregation of the study of civil war by focusing on the socio-economic dynamics of secessionist conflict as an identifiably distinct subset of 'civil wars', and by using a new subnational dataset compiled for this purpose. I test a series of hypotheses relating to the socio-economic conditions that encourage secessionism and political institutions that might mediate it. In contrast to the mainstream literature on civil war, I find a very strong predictive role for a measure of ethnic diversity in accounting for the incidence of secession. I also find a relatively straightforward set of socio-economic relationships. The relationship between relative socio-economic performance and conflict incidence is non-linear: regions that suffer from high 'horizontal inequalities' (Stewart 2008)—whether relatively poor or relatively rich—in relation to the rest of the country are more prone to secessionism. The presence of hydrocarbon deposits also dramatically increases the likelihood of secessionism. But the institutional story is more complex and contingent upon interaction effect with the degree of ethnic diversity and the level of horizontal inequality.

Stathis Kalyvas has drawn attention to two sets of problems in the econometric study of conflict: over-aggregation in the unit of analysis; and over-aggregation in analysis of 'violence' (Kalyvas 2008). These can be thought of as, respective, right-hand and left-hand problems. As Buhaug and Lujala (2005) observe in relation to the first issue, there is something of a methodological mismatch between the geographically restricted nature of most violent conflicts, which rarely engulf a whole country, and the country-level data typically employed in the analysis. This is particularly relevant for an investigation of secessionism, which by definition is geographically restricted to the subnational level. Hence, for instance, Humphreys and Mohamed (2005) explicitly investigate the applicability of the well-known Collier-Hoeffler (CH) model, which links the 'lootability' of primary commodities with the incidence of civil war, in Senegal and Mali, finding it wanting when considered in depth. Aggregated at the national level, Mali appears to confirm the CH model—a country with high primary commodity exports that has experienced civil war. Unfortunately for the CH model, however, this war—a Tuareg-led secessionist struggle—was located in the North of the country, far from the gold-producing regions in the south that make up the vast bulk of the country's commodity exports. On the right-hand side, then, the data entered into regression equations is often not fine enough to pick up the dynamics of conflict revealed by qualitative enquiries.

The second issue of over-aggregation relates to the operationalization of the left-hand side of the regression. The range of conflicts typically coded together as civil war is huge, from localized 'insurgencies' with little or no political motive evident, such as the Lord's Resistance Army in Northern Uganda, to more civil war ideal-type struggles for control of the state between contending ideological factions, such as the Greek Civil War. Moreover, meta-analyses which look at different definitions of civil war and different right-hand specifications have found that

only a small number of variables—specifically GDP per capita and population size—are robust predictors of this gross category of 'civil war' (Hegre and Sambanis 2006; Sambanis 2005). Some studies, including Fearon and Laitin's (2003) touchstone study and Sambanis' (2001) more systematic disaggregation, have sought to disaggregate between 'ethnic' and 'non-ethnic' civil war. As Kalyvas (2006) and Wilkinson (2008) have noted in different empirical contexts, however, attributing a single cause or motive to episodes of violence is extremely problematic: ostensibly 'ethnic' wars may be driven by many 'non-ethnic' incentives and causal mechanisms, and vice versa. An alternative approach to disaggregating the type of civil war, which is adopted here, is to define a subset based not on imputed cultural or ideological motivations but rather on the basis of the (stated) *objectives* of the warring parties. Secession here can be defined as a conflict aimed at creating a new state in a region controlled—*de jure* or *de facto*—by an existing state. There are good intuitive reasons to suspect that the dynamics of such conflicts may be very different from 'ideal type' civil war over control of a central state, if for no other reason than that they are, by definition, geographically restricted to a relatively small part of the country and, hence, more likely to affected by within-country variations in the explanatory variables that are not picked up in country-level analyses. In addition, rather than imputing 'ethnic' motivations to particular conflict, this definition allows us to explore the extent to which ethnicity is a driving factor in secession. While most contemporary secessionist movements appear to be based on ethnic nationalism, this has certainly not always been the case uniformly, as the example of the American Civil War demonstrates clearly. As a subset of conflicts to investigate, secessionism is also important in that it accounts for between a third and half of the violent conflicts around the world, and has done so since the early 1970s.

2 Theories of secession

2.1 Socio-economic theories

Socio-economic explanations of secession have focussed on the socio-economic standing of the separatist groups and/or region. In an early investigation into the socio-economic dynamics of secessionism, Horowitz (1981) produces a two-by-two matrix that differentiates between 'backward' and 'advanced' regional economies and 'backward' and 'advanced' groups, going on to categorize various secessionist and non-secessionist groups according to this criteria. While secessionist groups appear in all four quadrants, Horowitz notes a 'prevalence' of secessionism in backward regions and, particularly, among backward groups in backward regions; 8 of the 14 groups Horowitz identifies fall into this category. As Horowitz (1981: p.172) admits, his matrix 'does not provide an exhaustive enumeration of separatist movements, of which there have been dozens, if not hundreds, in the post-colonial period', and he does not provide any rationale for the selection of groups that were included. Nonetheless, two important observations can be taken from Horowitz' study. Firstly, irrespective of selection bias, it is clear that at least some secessionist movements appear in all four quadrants. In as much, we can surmise that any posited unidirectional relationship between socio-economic conditions and secessionist conflict is likely to, at best, constitute only a partial account. Secondly, Horowitz' differentiation of the relative socio-economic position of the would-be secessionist group itself and the relative position of the region in which it is concentrated remains an important distinction. In fact, much of the recent work on the socio-economic dynamics of secessionism has tended to overlook both

these issues, seeking to theorize and provide evidence for a linear relationship between regional socioeconomic performance and secessionist conflict.

A currently dominant approach current, drawn from broader conceptualizations of the root causes of conflict as being driven by 'greed' motivations, derives a theoretical account of secession that predicts its prevalence not in the relatively backward regions that Horowitz identified, but in relatively rich regions, particularly those endowed with natural resources. Secessionism, in this interpretation, is the 'rage of the rich', to use Paul Collier's (2000: p.10) evocative phrase. It is indeed easy to point to a number of secessionist movements that have emerged in regions richly endowed with natural resources—Collier cites the cases of Acehnese separatism in Indonesia, the Biafra War in Nigeria and Katanga separatism in the Congo. Henry Hale has developed a formal rational choice model to explain such secession within the particular context of 'ethnofederations', arguing that while we might intuitively expect relatively poor regions to be the most likely secessionists, the uncertainty surrounding the relative pay-off for secession or (continued) union means that such regions may opt against secession, even when they expect continued exploitation. In contrast, he suggest that 'those regions that have done best in the union tend to have the least to gain from it in the future' (Hale 2002: p.17), a finding for which he finds econometric support in analyses of attempted secession from both the Soviet Union and post-Soviet Russia. Similarly, Sorens (2005: p.310) hypothesizes that in advanced democracies support for (usually non-violent) secessionism is likely to be higher in 'relatively high-income regions' because 'redistribution tends to flow from wealthy to poor, and poor regions naturally enjoy the benefits, whereas affluent regions fear tight union'; again, he is able to show some econometric support for this hypothesis.

Alternative approaches to the dynamics of secessionism have emphasized the experience of relative socio-economic 'backwardness'. Ted Gurr's theory of 'relative deprivation', and the extensive Minorities At Risk dataset associated with his work (Gurr and Moore 1997; Gurr 1970; Gurr 2000), provides the strongest evidence of this link, although his focus is on broader forms of 'ethnopolitical rebellion', rather than secessionism *per se*. Michael Hechter's exposition of the idea of 'internal colonialism' (1975; 1992) similarly points to relatively backward regions as the most likely seceders. Hechter, however, also makes the important point that socio-economic explanations of secessionism should not be concerned only with regional and ethnic disparities, but also with the ethnic dynamics of the underlying structures of the economy, what he terms 'the cultural division of labor'. Aside from any inequalities it may generate, an ethnically segregated economy may generate tensions because of the differing policy preferences in different sections of the economy. Hechter illustrates by drawing on Barrington Moore's (1967) reading of the American Civil War as

> a conflict to determine what kind of production interest would determine subsequent legislation... the ante-bellum American South had an economy that was largely driven by exports of primary products, but the Northeastern economy depended more on the production of manufactures. These differences in production led to differences in the demand for protectionist legislation... as well as labor legislation

> (Hechter 1992: pp.270-1)

Broadly, then, theories of the socio-economic dimensions of secessionism diverge significantly on the regions which they expect to be more likely grounds for secessionist movements. On the one hand, the natural resource models and Hale's theory predict secessionism among (ethnically distinct) regions that are significantly better-off socio-economically. On the other hand, Gurr's theory of 'relative deprivation' and Hechter's 'internal colonialism' model point to regions that are relatively worse-off and/or less industrialized as the most likely secessionists. It is important to note that these differences are not just the result of epistemological or methodological positions. Hale's model is explicitly based on a rational choice epistemology, but so is Hechter's; Collier and Hoeffler's theory is quantitatively modelled, but so is Gurr's. Moreover, a cursory glance at the diversity of secessionist movements makes it clear that neither approach can provide an entirely satisfactory account. There are indeed many cases of resource rich or relatively industrialized provinces seeking secession, such as Aceh in Indonesia and Slovenia in Yugoslavia. But there are also many cases of relatively poor and under-developed regions seeking secession, such as East Pakistan (Bangladesh) and Eritrea (Ethiopia).

An alternative perspective on the socio-economic dimension of secessionism can be drawn from the literature on 'horizontal inequalities'—that is, inequalities between horizontally-defined groups such as ethnic, religious or regional groups (Stewart 2000; Stewart 2008). The advantage of the horizontal inequalities approach is that, like Horowitz's early formulation, its lays open the possibility that both relatively rich and relative poor groups or regions are more likely to secede, a possibility, as we have seen, for which there is at least prima facia evidence. The horizontal inequalities approach usually encompasses a broader definition of 'inequality' than is typical in economic literature, allowing for a more nuanced understanding of the relationship between inequality and conflict that the straightforward 'does inequality breed conflict' literature of the past (Cramer 2003; Lichbach 1989). Both econometric studies (Gates and Murshed 2005; Mancini 2008; Østby 2008) and case study evidence (Brown 2008; Langer 2005) has found a strong relationship between horizontal inequalities and internal conflict in general. It is worth noting in contrast to hypotheses such as those of Gurr, Hechter and Hale, the horizontal inequalities hypothesis is more empirically driven than theoretically. The case study evidence associated with the horizontal inequalities hypothesis, however, has uncovered a particular importance to the interplay between socio-economic inequalities and political and cultural exclusions in understanding the emergence of violent conflict. Brown's (2008) comparative study of secessionism in Southeast Asia, for instance, finds a 'double whammy' of ethnic and regional horizontal inequalities created the severe grievances that underlay secessionism in the region, but that it was the perception of discriminatory invention by the state that drove the turn to violent mobilization.

The theories and hypotheses outlined above posit different relationship between levels of regional and/or ethnic socio-economic advantage and the likelihood of (violent or non-violent) secessionism, but it is important to note that attributing *any* causal role of socio-economic factors in provoking secessionism and 'ethno-nationalist' movements more generally does not meet universal agreement. Among the strongest critics of this set of claims has been Walker Connor. Connor (1994: p.160) admits that 'economic discrepancies are near universal concomitants of ethnic strife' but contends that that such disparities are usually not the product of 'discrimination'—which he takes to be at the heart of relative deprivation arguments—but rather arise more often during processes of industrialization, which tend to lead to regional

imbalances at least in early stages and, hence, to differential impacts on regionally segregated ethnic groups. Connor does not completely deny any role for economic factors, but argues that they are primarily 'catalysts or indirect forces [and] should not be confused with cause' (Ibid.: p.161). For Connor, then, any role of socioeconomic factors in 'ethnonationalist' conflict is primarily an issue of 'propaganda'. However, insofar as ethnic difference itself can hardly be a direct 'cause' of conflict—or else we would likely see considerably more ethnic conflict that we actually do (Fearon and Laitin 1996)—Connor's essentializing distinction between 'causes' and 'indirect forces' seems to add little to our understanding of the dynamics of secession.

2.1.1 Natural resources and the socio-economic dimensions of conflict

Socio-economic theories of conflict in general point to a specific role for natural resources in provoking civil conflict, although the causal mechanisms through which this link operates is disputed. 'Opportunity' based theories of conflict typically see natural resources as 'lootable' commodities that increase the potential profitability of rebellion. Other scholars argue that the causal link between natural resource abundance is more indirect, operating through the overall negative impact that natural resource abundance typically has on economic growth (Auty 2001). Collier and Hoeffler's econometric analyses of the socio-economic determinants of internal conflict, for instance, point to the dependency of the national economy on natural resource exports as a key factor in explaining civil war incidence (Collier and Hoeffler 2004), although both the econometric robustness of these findings (Fearon 2005) and the appropriateness of the measure employed (Buhaug and Gates 2002), which suffers from problems of over-aggregation and potential endogeneity, have been disputed.

These studies all relate to general theories of internal conflict, however, and surprisingly little attention has been paid to the role of natural resources in secessionist struggles *per se*, despite the obvious potential of a theoretical link between the subnational variation in resources abundance and the subnational nature of secessionist violence—a link that also becomes eminently more testable once one disaggregates below the national level. Michael Ross' (2004) systematic qualitative comparison of thirteen cases of civil war finds that natural resource distribution played an important role in instigating two of the three separatist cases he considers, but had no role in the ten non-separatist conflicts. Case studies of secessionist movements have also often pointed to a particular role for natural resources in generating regional grievances based not so much on actual economic performance relative to the rest of the country, but on the *expectations* of wealth generation that natural resources provide. In Indonesia, for instance, Zulfan Tadjoeddin argues that it was the 'aspiration to inequality'—the belief in regions such as Aceh and Irian Jaya that they were not profiting as much from their natural resource wealth as they should—that drove secessionist movements (Tadjoeddin 2003). Similarly, Humphreys and Mohamed's comparative study of secessionism in Senegal and Mali argues that economic grievances behind secessionism may be linked to 'the sense that, on the basis of land fertility, the region ought to be *particularly* wealthy' (Humphreys and Mohamed 2005: p.269, emphasis original).

2.2 Political theories: Democracy and decentralization

Quantitative studies of civil war have typically identified an inverse U-curve relationship between the level of democracy and the incidence of civil war broadly defined (e.g. Hegre, et al. 2001; Hegre and Sambanis 2006). Theoretically, democracies are seen as less likely to

experience civil war because they are able to contain and address grievances through the formalized political process more easily, while extreme autocracies are more able to suppress dissent. Hence, 'anocracies'—regimes that combine features of both democracy and authoritarianism—are seen as most vulnerable. In addition, a recent body of literature has suggested that the process of democratization in itself renders countries particularly liable to ethnic conflict (Mann 2005; Snyder 2000). These theories, however, have largely been applied to the general category of civil war, rather than the more specific case of secessionism. Previous studies that focused on secessionism and ethnoregional protest in particular have tended rather to posit a linear correlation between democracy and secessionism, building on the 'ethnic outbidding' thesis (Horowitz 1985; Rabushka and Shepsle 1972). Saideman et al. (2002) find democracies more liable to ethnic rebellion; Brown's (2009) analysis of 'ethnoregional protest' produces similar results. Case study evidence cautions us to be careful interpreting these results, however. Katharine Adeney (2009), for instance, argues that in Pakistan while both the Bengali and Baluchi secessionist movements emerged during periods of democracy, the democratic institutions themselves were not implicated in the turn to violence. Widmalm (2002) argues that it was the substantive *failure* of democracy in Jammu and Kashmir that led to the outbreak of violence; similarly, Brown (2008) notes that while the emergence of Christian-Muslim conflict in the southern Philippines occurred during Marcos' period as a democratically-elected President, it was his abrogation of democracy and declaration of Martial Law that provided the 'springboard' for the turn to full secessionism.

Much of the focus on political institutional factors in explaining secessionism has been directed to investigating the impact of the nature and extent of decentralized or federal institution in exacerbating or mediating the risks of secession. In 1972, Eric Nordlinger (1972: p.31) argued that federalism was not a suitable *solution* to ethnic conflict and secessionism as 'the combination of territorially distinctive segments and federalism's grant of partial autonomy sometimes provides additional impetus to demands for greater autonomy'; hence, 'federalism may actually contribute to a conflict's exacerbation'. More recently, Valerie Bunce has argued that federalism was a key factor in the post-Soviet break-ups in Eastern Europe; 'If new democracies inherit a national federal structure, they tend to be more vulnerable to secessionist pressures' (Bunce 1999; Bunce 2004: p.436). John McGarry and Brendan O'Leary, however, directly gainsay this line of reasoning, arguing that in each case in postcommunist Europe, it was moves by the central government to restrict or roll-back the level of autonomy granted in the federal structures that led to secessionist pressures; short of federalism encouraging secession in these countries, it was the demise of 'true' federalism that was the problem (McGarry and O'Leary 2009). Whatever the academic perspective, federalism certainly has something of a 'bad name' (Horowitz 1989: p.33) in many multiethnic countries, and the view that it constitutes little more than a 'stepping stone' towards secession has certainly been shared by a number of central governments in such states, including Indonesia (Ferrazzi 2000).

In any case, scholar are increasingly realizing that 'federalism' covers such a broad spectrum of institutional arrangements, and the influence of federal structures is likely to interact with other sociological or economic influences, so that it is implausible to assert 'federalism' in general increases or decreases the risk of secessionism. A more contextual approach is hence required that asks under what conditions certain types of federal structure might influence the risk of secessionism.

One such contextual approach to the relative stability of federalist structures has been to ask what kinds of ethnic demography might be more conducive to resisting secessionist pressures in a federal context. Brendan O'Leary, for instance, has argued that federalism is most stable where the country has what he terms a *Staatsvolk*, 'a national or ethnic people who are demographically or electorally dominant' (O'Leary 2001: p.285).   O'Leary's logic here is straightforward: 'an ethno-national group with a decisive majority of the federal population has no reason to fear federation... A *Staatsvolk* may be more willing to have its own national territory divided up into multiple regions, states, or provinces, knowing that it is not likely to be coerced by minority peoples at the federal level' (Ibid.). Where there is not a *Staatsvolk*, or where its position is 'precarious', O'Leary suggests that consociational institutions offer the best promise of stability, although he is rather pessimistic about this.   An alternative perspective is offered by Henry Hale, however, who sees danger in the existence of a 'core ethnic region'— which he defines as a broadly ethnically-homogenous region that 'contains either an outright majority of the population or makes up at least 20 percent more of the whole country's population than does the second largest region' (Hale 2004: p.169). Hale draws in part here on Horowitz' (1985) well-known thesis about 'drawing through' versus 'drawing round' federalism: state boundaries that cut across major ethnic boundaries ('drawing through') are seen as more stable than boundaries that encircle major ethnic groups ('drawing round') as they minimize incentives for ethnic mobilization by decentralizing power to the state level, where no group dominates.

The problem with both O'Leary's and Hale's arguments are that much rests on the interpretation of the history and current stability of 'crucial cases' such as Nigeria. For O'Leary, Nigeria may not be expected to survive long without the incorporation of consociational institutions because Nigeria lacks a *Staatsvolk*; the largest ethnic group according to his data are the Yoruba, who constitute only 21.3 per cent of the population. In constrast, Hale argues that in the First Republic, the Hausa-Fulani dominated Northern Region, with more than 50 per cent of the population, constituted the kind of 'core ethnic region' he sees as a dangerous, and draws upon academic analysis and contemporary reportage to argue that fear of domination by this Northern Region was a major driving force in the attempted secession by the Yoruba and the ensuing Biafra War. The redelimitation of boundaries and the proliferation of states from four to more than thirty along the Horowitzian 'drawing through' principle has, according to Hale's interpretation, been a key factor in preventing a repetition of the 'ghastly form of state collapse' associated with the First Republic, although he of course accepts that Nigeria's post-Biafra history has not been without its problems (Hale 2004: p.189). O'Leary in turn concedes that the 'drawing through' of Nigerian federalism has an 'interesting' logic to it but that empirical support is limited precisely to 'the rather uninspiring case of post-bellum Nigeria' (O'Leary 2001: p.282).

Other scholars have looked beyond ethnic demography to examine the political economy of federalism. Bakke and Wibbels (2006) test a number of hypotheses about the political economy of federal states, and find that the impacts on federalism are largely contingent on other factors. Fiscal decentralization is found to promote rebellion in circumstances of high inter-regional inequality; inter-regional inequality itself is positively correlated with rebellion where ethnic groups are geographically concentrated, although they also find that increased fiscal transfers mitigate this effect. Finally, they find that 'encompassing national governing parties' increase the likelihood of rebellion where regional minorities are excluded. This latter finding dovetails

with Brancati's (2006) study of decentralization and secessionism, which argues that decentralization has both direct and indirect impacts on secessionist likelihood. Directly, decentralization reduces the probability of secession, but it also has a converse indirect effect that encourages secessionism through promoting the growth of regional political parties. Tranchant (2008) finds that *fiscal* decentralization has a better conflict-mitigating impact in richer countries. Finally, Brown (2009) find that *political* decentralization has similarly a complex relationship with 'ethnoregional protest', interacting positively with the level of ethnic difference to encourage protest and rebellion, but negatively with the level of regional wealth.

3   Methodology: Unit of analysis and regression models

Typically, quantitative studies of civil war have taken the 'country-year' as their unit of analysis—where each observation consists of a given country in a given year, for instance 'India 1972'—and have employed pooled logistic regressions to identify significant correlates of conflict (e.g. Caprioli 2005; Fearon and Laitin 2003; Østby 2008; Urdal 2006). Both these aspects are problematic however, particularly in consideration of secessionist violence.

3.1   The unit of analysis

What should constitute the unit of analysis for a quantitative analysis of secessionism? This is a tricky question which requires delicate adjudication between theoretical purchase and data availability. The standard unit of analysis for econometric studies of conflict is at the country level with the 'country-year' defining the typical observation. But as Buhaug and Lujala (2005) observe, this constitutes something of a methodological mismatch between the geographically restricted nature of most violent conflicts, which rarely engulf a whole country, and the country-level data employed. This is particularly relevant for an investigation of secessionism, which by definition is geographically restricted to the subnational level.

Given that possible socio-economic determinants of secessionism are likely to vary importantly within the country, then, a more productive route would be to shift the level of analysis down a step from the tradition 'country-year' to a subnational unit. Country-level investigations could try to capture this with a measure of, for instance, inter-group or inter-regional horizontal inequality but while this may be a good indicator of overall conflict potential (Østby 2008), it is less useful in modelling separatist conflict, precisely because a national level measure cannot identify *which* groups are relatively advantaged or disadvantaged. There is hence a high risk of false positives—countries with high levels of horizontal inequality but which experience secessionism in a relatively average region—and false negatives—countries with generally low levels of horizontal inequality but which experience a secessionist movement in an exceptionally unequal region. Hence, a country-level analysis does not seem appropriate for investigating the dynamics of secession.

Shifting the level of analysis to the subnational level begs the question of what should constitute the new unit of analysis. Two prime candidates offer themselves—a group-based analysis, in which each (ethnic, religious) group constitutes an observation; or an analysis based on subnational geographic units. Each approach has its advantages and disadvantages. The group based approach has been undertaken extensively by the Minorities At Risk (MAR) programme associated with Ted Gurr (Gurr 1993; Gurr 1998), but suffers some considerable limitations.

Firstly, data availability at the group level is often sparse; the MAR dataset hence relies largely on subjective assessments across a variety of indicators. Secondly, and more fundamentally, the group-based approach suffers from a problem of selection on the dependent variable. The MAR project only includes groups pre-judged to be 'At Risk'. More recently, the Ethnic Power Relations dataset developed by Lars-Erik Cederman, Andreas Wimmer and their collaborators has improved upon the MAR approach by incorporating both 'included' and 'excluded' ethnic groups (Cederman, et al. 2010).

The second candidate is to use a subnational geographical unit of analysis, but this also brings several problems. An obvious approach would be to use the Primary Administrative Division (PAD) of the country in question—states in the USA, India, Nigeria, and most other federal systems, provinces in Indonesia, Canada, China, and so forth. The advantage of employing a PAD-level analysis is that the kind of objective subnational socio-economic data we are interested in are much more widely available at this level than for a group-based analyses. Two shortcomings, however, relate to variations in the actual size of PADs—both in terms of absolute population size and in terms of proportion of the national population—and to a possibly somewhat endogenous relationship between the way in which PAD boundaries are drawn and the incidence of secessionism.

Variation in the size of PADs presents problems because large PADs can 'hide' subnational variations in correlates of secessionism that might be evident if we disaggregated at a lower level. To give one pertinent example, Thailand is administratively sub-divided into over 70 provinces, which are also sometimes aggregated into ten regions. In 1997, the Malay/Muslim-dominated province of Narathiwat, which has experienced intermittent secessionist violence, had a per capita GDP barely 0.40 times the national average. However, the Southern region as a whole, into which Narathiwat falls, has a much higher (although still relatively low) GDP ratio of 0.67. Moreover, the Southern average is pulled up by rich, Thai/Buddhist dominated provinces such as the tourist hub of Phuket, which has a per capita GDP over two times the national average. So in this case, disaggregation at the regional level would mask severe regional inequalities experienced by minority-dominated provinces in the South. As Fearon (2003) note, however, this problem of disaggregation is also present in group-based analyses in some circumstances, particularly where one must adjudicate between selecting higher-level identity groups (such as the Akan in West Africa) or lower-level 'sub-ethnic' groups or 'tribes' (such as the Ashantis and Fantis).

A second problem for a PAD-level analysis relates to the possibility that the way in which PADs boundaries are drawn may impact upon the likelihood of secessionism. The 'drawing through' maxim—that subnational boundaries, whether at the region/PAD level or in terms of voting constituencies, should be drawn in such a way as to minimize the ethnic distinctiveness of each unit—is a well-regarded, although by no means universally accepted, proscriptive hypothesis about conflict management in multiethnic countries (Horowitz 1985; Horowitz 1989). As noted above, however, the 'drawing through' maxim has not been widely applied in practice. Moreover, while there may remain some potential problems of endogeneity in the way in which regional boundaries have been drawn, there is no reason to believe that these problems are any greater than those affecting the way in which *national* boundaries were drawn in much of the postcolonial world.

3.2 Regression models

The standard econometric approach in the study of conflict to date has been to pool all the country-year observations available into one dataset and to use a straightforward logit regression, usually excluding years with an on-going conflict. While simple to implement and easy to interpret, this model has come under some criticism for not adequately accounting for the interdependence of unit observations over time, particularly in the case of repeat conflicts (Box-Steffensmeier, et al. 2005; Brown and Langer 2009). Attempts to address this shortcoming include a 'peace years' or 'regime transition' dummy which codes for the number of years since the end of a previous episode of conflict or a regime change, often transformed into a 'decay' function (e.g. Urdal 2006; see below for details of decay function); and, clustering of the standard errors on the geographical unit of observation (e.g. Østby 2008). The problem of clustering is compounded here by the nested nature of the data—it is not intuitively clear whether we should be clustering at the country level or at the PAD level. With such manifest shortcomings, there seem few reasons to implement this approach, especially given the alternative models available, as discussed below. Perhaps the main defence remaining for pooled logit models is the ability to implement 'rare event' adjustments (cf. King and Zeng 2001; Tomz, et al. 1999). Existing studies of conflict incidence, however, report only minor differences in estimates between a standard pooled logit and the rare events adjusted logit (e.g. Fearon and Laitin 2003).

Rather than treating observations as a single pool, I estimate two different models that are better able to deal with the nature of the data: multi-level panel models and the Cox Proportional Hazards model. Multi-level models allow for observations that are in nested clusters and have recently been applied in conflict research to explore regional and 'neighbourhood' dynamics of civil war incidence (Raleigh 2007). The model allows for unobserved effects or 'latent variables' (Rabe-Hesketh and Skrondal 2008) at the different levels by allowing the intercept to vary randomly. In this case, the data is nested in three levels: PAD-year observations (level I), nested within PADs (level II), nested within countries (level III). As the dependent variable is binary (see below), the model is run as a multi-level logit regression, which is implemented in STATA 10 as `xtmelogit`; alternative estimations using the `gllamm` (Generalized Linear Latent and Mixed Models) add-in package for STATA (cf. Rabe-Hesketh, et al. 2005) produce virtually identical results and are not reported.

An alternative set of statistical models which reduces problems associated with interdependence of observations over time—indeed, which are premised upon such interdependence—are 'survival' models that originated in epidemiological research, notably the Cox Proportional Hazards model. The Cox model calculates a 'baseline hazard' and the additional hazard (positive or negative) associated with each of the covariates, which is assumed to be constant over time (hence the proportional hazards model). Such survival models have increasingly been applied in the study of civil war, primarily in relation to war duration (e.g. DeRouen and Sobek 2004) and the sustainability of post-war settlements (e.g. Fortna 2004). Application to civil war onset is more problematic for survival models because of the necessity of defining a 'time zero' (t_0)—analogous in epidemiology to the time at which the subject is administered a treatment. For studies of conflict duration and sustainability of post-war peace, defining this time is clear—the point of war outbreak and war settlement, respectively—but for conflict onset, defining t_0 is more problematic. Where countries gain independence within the

time frame of the study, defining t_0 is relatively easy, but for longer standing countries, the decision is more problematic. In their study of broader political stability and regime change, Gates et al. (2006) use the definition of polity duration derived from the Polity IV dataset of political institutions; a slight modification of that approach is adopted here and discussed in more detail in section 4.2.5 below. An additional advantage of the Cox model is the ability to hold for event interdependence as well as time interdependence—that is, the additional likelihood of conflict recurrence over initial conflict onset—through stratification, as proposed by Box-Steffensmeier et al. (2005). Stratifying on previous conflict incidence directs the model to calculate a separate baseline hazard for observations that share the same value of the strata variable; implementation of this is again discussed further in section 4.2.5.

4   Variables and data

4.1   Dependent variable

The dependent variable is based upon the PRIO/Uppsala Armed Conflict Dataset. The dataset codes for conflicts based on the nature of the 'incompatibility' between the conflict parties. Those based on 'territorial' incompatibility were taken as the core list, with the exclusion of 'extrasystemic' anti-colonial wars. Each conflict was then mapped onto the appropriate geographical subunit(s) of the country in question based on a reading of the appropriate qualitative literature.

4.2   Explanatory variables

4.2.1   Ethnic diversity

Typically, quantitative investigations of the relationship between ethnic or religious diversity and conflict have employed one of two measures: the fractionalization index, or the polarization index (Collier and Hoeffler 2004; Montalvo and Reynal-Querol 2002; Montalvo and Reynal-Querol 2003; Sambanis 2001). The fractionalization index, effectively a Herfindahl concentration index, gives the probability that two randomly selected individuals from the population belong to different ethnic groups. Use of the fractionalization measure has been questioned on two fronts. Montalvo and Reynal-Querol (2002; 2003) have argued that the fractionalization index is not useful in modelling conflict because the relationship between fractionalization and conflict is not likely to be linear: extremely homogenous populations are intuitively unlikely to experience ethnic conflict but so, they argue, are extremely heterogeneous populations, as no group has the 'critical mass' to engage in ethnic conflict. They thus propose a new index of ethnic (or religious) polarization, which measures how far a population is divided into two large groups, which they take to be the most conflict-likely scenario.[1] The measure hence reaches its maximum value of 1 where the population is divided into two exactly equally sized group, and reaches 0 where the population is either entirely homogenous or entirely heterogeneous.

When we consider the possible ethnic dynamics of *secessionist* conflict in particular, however, it becomes clear that neither measure is entirely appropriate. Firstly, in terms of the

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[1] It is important not to confuse the Montalv Reynal-Querol index with the alternative polarization index developed by Esteban and Ray (1994) which calculates the level of economic polarization; Montalvo and Reynal-Querol's index is purely demographic.

fractionalization index, secessionist conflicts have emerged in countries which are relatively homogenous with a small minority. In both the Philippines and Thailand, for instance, secessionist movements based largely on ethnoreligious identity have emerged among their Muslim populations, which constitute around 5 per cent of the population in each case. Moreover, the remainder of the population in both cases is religiously homogenous; around 80 per cent of the Philippine population are Roman Catholic, with a further 10 per cent or so belonging to other Christian denominations; while more than 90 per cent of the Thailand population is Buddhist. The two countries hence have very low religious fractionalization scores in the FL dataset, of 0.300 and 0.096 respectively.

We might suppose, therefore, that secessionist movements are *more* likely to emerge in relatively homogenous populations with a small minority—i.e. countries with small but non-zero fractionalization scores. But this doesn't necessarily hold either. The Acehnese in Indonesia, for instance, constitute less than 1 per cent of the country's population, but Indonesia as a whole is also extremely ethnically diverse, with a fractionalization score of 0.854. So the fractionalization index appears not to provide a useful means of gauging national susceptibility to secessionism. Neither is polarization a useful measure here. Secessionist groups do indeed typically form a relatively small proportion of the population; the Oromos in Ethiopia (around 30 per cent of the national population) and the Sri Lankan Tamils (around 18 per cent of the national population), are probably the largest secessionist groups. There is a demographic logic here: larger groups are more likely to seek control of the existing state than to secede from it. So we might thus expect the polarization index to be *negatively* correlated with likelihood of separatist conflict. But here we run into other problems. Small separatist groups could still emerge in highly polarized societies. A distribution of 50:45:5, for instance, might see the smallest group attempting secession. In Sri Lanka, for instance, while the Singhalese population is often treated as a single group, there are important political and cultural differences and, historically, tensions between 'Lowland' and 'Upland' or Kandyan Singhalese (da Silva 2005). The DHS Survey data for 1987 differentiates these groups, giving a distribution of 49% Lowland Singhalese, 39% Upland Singhalese, 7% Tamil, with 5% belonging to smaller groups, giving a very high polarization score of 0.889.

The root problem with both these measures from the perspective of modelling secessionist conflict is that they are measures of *country-level* ethnic variation, whereas separatism is inherently a sub-state phenomenon; an example of the over-aggregation problem described above. Because secessionism by definition involves territorial contestation over a portion of the existing state, the demographic logic of secessionism is inherently linked to a geographic dimension. A 5 per cent minority concentrated in one region may engage in secessionist activity; a 5 per cent minority spread evenly across the country is considerably less likely to do so.

What kind of measure of ethnic demography might be useful for modelling secessionism at the subnational level? We are interested in how far the subnational unit *differs* in its ethnic make-up to the national level. Here, I propose a simple measure of ethnoreligious difference, which I term the Ethnoreligious Difference Measure (EDM): the summation of the absolute difference in the proportion of each ethnic group in the subnational region we are interest in and in the rest of the country. Algebraically, if a country is divided into *n* ethnic groups, which constitute proportion p_i of the subnational region (*s*) in question and proportion r_i of the rest of the country, this measure is given by:

$$EDM_s = \frac{1}{2}\sum_{i=1}^{n}|p_i - r_i|$$

Intuitively, this measure can be interpreted as the proportion of the population of the subnational region that would have to 'convert', or change ethnic affiliation, in order for the ethnic distribution to match that of the rest of the country. The measure ranges from 0, where both populations are identically distributed, to 1, where the subnational region is entirely populated by a group or groups that are completely absent from the rest of the country.

For operationalization in the regression analyses, three separate variables were created—`ethdiff` and `reldiff`, which report the ethnic difference and religious difference measures respectively, and `maxdiff`, which reports the higher of the two variables where both are calculable, or the single available measure otherwise. Unfortunately, there are of course some countries where this level of geographically disaggregated ethnoreligious data is not available at all. In order to be able to incorporate these countries into some of the analysis, I generate another variable `mdplus` which is equivalent to `maxdiff` where this data is available, and otherwise takes the value of the national-level fractionalization index. There is a reasonable correlation between the national fractionalization index and the regional ethnoreligious difference measure for those PADs for which the latter is available (Pearson's R=0.229) and it is clear that at the two extremes of their respective ranges, the two measures must be equal—in an entirely homogenous population, both the national fractionalization and regional ethnoreligious difference of each PAD must be zero; similarly, where every individual (in a theoretically infinite population) belongs to a different group, both measures must be 1. But, as described above, this proxy measure is also likely to underestimate the regional ethnoreligious difference of regions intuitively likely to be more prone to secessionism, such as small, regionally-distinct minorities in an otherwise homogenous country. I hence test separately against the combined `mdplus` variable and against the more limited domain of cases for which `maxdiff` is available.

4.2.2   Geographic distance

Partly due to the advent of GIS technology, the geography of civil war is receiving increasing attention in the quantitative literature (Buhaug and Gates 2002; Buhaug and Lujala 2005; Murdoch and Sandler 2004). Indeed, Buhaug and Gates' (2002) investigation of the geography of civil war finds that secessionist conflicts—defined in their dataset according the nature of the 'incompatibility' coded in the Uppsala conflict dataset—are located significantly further from the national capital than other types of civil war. Their results, however, are based on a comparison of different types of conflict, not on conflict incidence *per se*, and we thus cannot infer directly from their results that remoter regions are more prone to secessionism. Intuitively, we might hypothesize that secessionist conflicts are likely to emerge in regions more distant from the national capital for two reasons. Firstly, given that ethnic groups are typically geographically concentrated, more remote regions are more likely to be constituted by a population ethnically distinct from the titular or nationally dominant group. Secondly, a feasibility hypothesis would suggest that secessionist violence is more likely in distant regions because state control typically dissipates with distance, with reduced state presence—both military and civilian—insurgency becomes a more viable option. I measure distance as the base-10 logarithm of the distance between the 'centroid' of the PAD—the centre point of the smallest regular polygon that can be fitted over PAD—and the centroid of the capital region. Taking the logarithm generates a

non-value for the capital region itself (because the distance in kilometres is zero), but this is not problematic as I exclude capital regions from the analysis, as described below.

4.2.3 Spatial inequality

The main socio-economic variable we are interested in is the relative performance of the sub-national PAD to the national level but, as outlined in section 2.1, a range of theories exist linking spatial inequality to secessionism. The simplest measure of relative socio-economic performance—and the one for which data is most readily available—is a straightforward ratio of the GDP per capita in the PAD in question to the national level GDP per capita. Distilling from the theories outlined above, we can generate four broad hypotheses about the link between relative GDP per capita and secessionism:

> *Hypothesis 1A:* *Relatively rich PADs are more likely to attempt secession, the 'rage of the rich' hypothesis (Hale, Collier). The relationship between relative GDP per capita and secessionism will be linear and positive;*

> *Hypothesis 1B:* *Relatively poor regions are more likely to attempt secession, supporting the relative deprivation hypothesis (Gurr, Hechter). The statistical relationship will be linear and negative; and,*

> *Hypothesis 1C:* *Both relatively poor and relatively rich regions are more likely to attempt secession, supporting the horizontal inequalities hypothesis (Stewart; Brown). The relationship will be non-linear and positive.*

> *Hypothesis 1D:* *These is no significant relationship; socio-economic status—at least as measured with GDP per capita—does not have any systematic relationship with secessionism (Connors).*

There is, of course, another logical possibility which is not covered by these hypotheses, that of a non-linear results with a negative sign; both relatively poor and relatively rich regions are less likely to attempt secession. Explaining this outcome would require some form of combined hypothesis, asserting that relatively rich regions are doing well out of their current status and hence unlikely to attempt secession, while relatively poor regions lack the resources to attempt secession, hence leaving secession most likely among the middle-income regions.

These hypotheses are tested with two variables computed from sub-nationally disaggregated GDP data. The first variable, `relgdp`, is simply the ratio of PAD-level GDP per capita to national GDP per capita. This ranges from a low of 0.175 (equivalent to a per capita GDP less than one fifth of the national average)—the Thai province of Nong Bua Lam Phu in the impoverished North East region—to a high of 10.8, achieved by the Indonesian oil and gas producing province of Riau which, in 1975, recorded a GDP per capita of 969,000 rupiahs against the national average of 91,000 (Akita 1988). This variable tests for the linear hypotheses. The second variable, `hineq`, is a transformation of this ratio (derived from Østby 2008) to generate a measure of horizontal inequality: values above 1 (i.e. relatively rich regions) are inverted (e.g. a relative GDP ratio of 4.0 is transformed to 0.25); values below unity are unchanged; this figure is

then subtract from 1 to give a measure that increases with the level of (positive or negative) disparity. Algebraically:

$$hineq = 1 - e^{|0 - \ln(relgdp)|}$$

As formulated here in terms of GDP per capita alone, these are all relatively simplistic hypotheses, as they do not take into account intra-PAD inequalities—including ethnic inequalities between groups indigenous to the region and migrants from other regions—or any disparity between a region's wealth generation (i.e. GDP) and the extent to which this wealth is returned to the inhabitants of that region (e.g. the relationship between relative GDP per capita levels and relative poverty levels). Unfortunately, however, systematic data on these variables is extremely poor across different countries and time periods.

Indeed, even GDP data disaggregated at the sub-national level is something of a luxury. In a few cases, such as India and Yugoslavia, long time series data are available, but in many cases, even in developed countries, only a relatively short time period is available, if at all. It may be possible to overcome this problem to some extent by using a variety of proxies—Bakke and Wibbels (2006), for instance, use provincial primary school enrolment rates to proxy for GDP in some countries—but this may create problems precisely because the disparity between GDP levels and other socio-economic 'outcomes' at the local level may be a key grievance: following the relatively deprivation hypothesis, PADs with roughly average school enrolment rates but high GDP per capita would experience higher level of grievance than PADs with average enrolment and average GDP levels. For the sake of clarity in the hypotheses under investigation, I hence limit the study only to those countries which provide disaggregated GDP per capita data. Altogether, data on 31 countries was compiled, constituted by over 600 PADs, generating around 12,000 'PAD-year' observations. Values of both `relgdp` and `hineq` are lagged by one year. The countries included are broadly representative, with East and West European, North and South American, and South and East Asian countries included. Noticeable lacunae for which no data was available were any countries in sub-Saharan Africa except South Africa, the Middle East and the post-Soviet Central Asian states. This places important limitations on the interpretation of the results particularly because sub-Saharan African, as already noted, is a region of remarkably low levels of secessionism despite its generally low socio-economic development, while post-Soviet Central Asia has experienced high levels of secessionism, including Nagorno-Karabakh in Azerbaijan, and South Ossetia and Abkhazia in Georgia (Bölükbaşi 2001; Lynch 2004).

As noted above, theories of civil conflict typically afford a particular importance to natural resources, especially 'lootable' or point commodities such as diamonds (Lujala, et al. 2005) and oil or natural gas deposits (de Soysa 2000; Le Billon 2001). In national level analyses, this is typically measured using primary exports as a proportion of GDP. Lacking equivalent data at the subnational level, I instead use a simple proxy which takes the form of a dummy variable `petro` that scores 1 in the event that the PAD had exploitable hydrocarbon deposits—either being exploited, or discovered but not yet exploited—and 0 in all other cases. This variable was derived by mapping the longitude and latitude coordinates from the PRIO Petroleum Dataset v.1.1 (Lujala, et al. 2007) onto the relevant subnational regions.

4.2.4   Political institutions

The existing literature suggests two possible relationships between democracy and secessionism—the well-established inverse U-curve derived from the broader literature on civil war, and a linear relationship between higher levels of democracy and greater likelihood of conflict, a result established in the literature devoted to secessionism and 'ethnoregional protest', but which has only been tested on a subset of relatively democratic states. I test for both possible relationships using the usual indicators in the econometric literature—the Polity IV democratization index, which codes for the level of democracy in a country on an annual basis, ranging from –10 (full autocracy) to 10 (full democracy) (`polity`); and, a squared transformation of this index to pick up a possibly non-linear relationship (`politysq`).

Finding data for useful measures of the extent and nature of sub-national institutional decentralization (in a broad sense) is more problematic. The IMF Government Finance Statistics reports an annual measure of *fiscal* decentralization which measures the proportion of GDP per capita transferred from central government to subnational tiers, but this suffers from several shortcomings. Firstly, coverage is relatively sporadic, with many missing data points. Many of these missing points can be filled with linear interpolation, but there remains a problem of selection bias: those countries which report fiscal decentralization statistics are significantly more democratic and higher income than those which do not.[2] Another problem relates again to the national level at which this data is aggregated, whereas theoretically and intuitively we might expect subnational *variations* in the extent of fiscal decentralization to be more accurate correlates of secessionism. Regional populations that feel they are not getting their just share of government revenues relative to the rest of the country are more likely to incur separatist pressures; a hypothesis that finds some empirical support in Alemán and Treisman's (2005) study of fiscal policy and secessionism in India, Pakistan, Nigeria and Yugoslavia. Lacking this kind of subnationally disaggregated data systematically across countries, however, the national level data can at least be taken as a useful approximation of the level of absolute rather than relative fiscal decentralization. The variable generated `fiscd` measures this, including linear interpolation for missing data points.[3]

Measuring the extent of *political* decentralization is also problematic. Gary Marks, Liesbet Hooghe and Arjen Schakel have produced an annualized measure of 'Regional Authority' aggregated at the subnational level, based on coding across a range of possible political institutions (Marks, et al. 2008), and this dataset has been shown to be useful in explaining the incidence of 'ethnoregional protest' in Europe and other high income countries (Brown 2009). As the country coverage of the Regional Authority Index is restricted only to these high income countries, however, it is less useful for our purposes here. One possibility is simply to include a dummy variable for countries with a federal constitution but operationalizing this dummy is problematic. One the one hand, there are countries that are self-declared federations but do not exhibit the kind of political institutions associated with federalism, either because they are inherently undemocratic (as in Pakistan during its periods of military rule) or because they are

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[2] In the year 2000, for instance, the 289 PADs for which fiscal decentralization data were available had an average Polity score of 9.3, against 6.6 for those without decentralization data—a statistically significant difference with a t-value of 8.4.

[3] Two of the countries in the study—Russia and Yugoslavia—have no data availability, however, and drop out of the model in which `fiscd` is included; other countries have a shorter time series included.

'pseudo-federations' which have federal institutions but in which political power is effectively centralized at the national level (such as Malaysia). On the other hand, other countries have eschewed the moniker of federalism but nonetheless have a de facto federalist structure—post-Suharto Indonesia being a paradigmatic example here. Instead, I use a dummy variable, `subnattier`, based on Daniel Treisman's list of countries with subnational tiers of government that maintain 'residual powers' (Treisman 2002).[4]

4.2.5 Control variables for interdependence

As discussed above, I use two different models to estimate results: a multilevel linear logit regression and the Cox Proportion Hazard model. The first of these is better suited to handling the nested nature of the observational units; the latter model is better suited to catering for interdependence of observations over time. Both, however, require additional measures to minimize problems of <u>event</u> interdependence—that the risk of conflict is likely to be very different in PADs that have experienced previous secessionist conflict, irrespective of the passage of time.

While the multilevel logit model effectively caters for the nested nature of the observations—PAD-years nested within PADs, nested in turn within countries—it suffer from the same shortcoming as the standard logit in that it does not hold for the passage of time within the level 2 clusters. Typical control variables for interdependence over time include a measure of 'peace years' preceding the current observation, indexed to the end of a previous episode of conflict or independence/regime change in a unit that has not experienced conflict; and, a variable (usually a binary dummy) that holds for previous conflict. For the multilevel model, I use both a measure of peace years, transformed into a decay function that halves every four years (`decay`) to hold for temporal interdependence and a dummy variable for any previous attempts at secession in the PAD in question (`prevatt`) to account for event interdependence. Because of the nested nature of the data, I also include a third measure of temporal interdependence at the country level: a dummy variable that captures where there was a conflict in the previous year elsewhere in the country (`otherconf`).

For the Cox model, once the selection of an appropriate t_0 is made, the passage of time is not problematic so the peace year decay function is not necessary, but the model still needs careful attention to event interdependence and the nested clusters of observations. Both in selecting t_0 and holding for event interdependence, I largely follow the approach recommended by Box-Steffensmeier et al. (2005). I define t_0 as the point of previous regime transition, including independence (coded for in the Polity IV dataset) or else the end of a previous episode of conflict where appropriate. Again following the Box-Steffensmeier proposals, I hold for event interdependence by stratifying the data on whether or not the region has previously attempted secession (`prevatt`) and a second stratum on whether there is an ongoing conflict elsewhere in the country, `otherconf`. These models, it should be remembered, do not provide a direct estimate of the 'effect' of the strata variables, but rather calculate a separate baseline hazard for each stratum. Because the Cox model calculates hazards based on the passage of time within PADs, the first degree of observation nesting is effectively catered for; I hold for the second level of nesting by stipulating clustered standard errors at the country-level.

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[4] Treisman's analysis is based on mid-1990s data, and I have updated it to take account of a few institutional changes in subsequent years, including post-Suharto decentralization in Indonesia.

5 Results

Table 1 reports the results for three basic models focusing on the subnational economic disparity variables. As described, each model is estimated using a mixed-method multilevel logit (MML) and the Cox Proportional Hazard (Cox). Within each model, the different estimation methods produce consistent results in terms of sign[5] and, for the most part, the level of significance, although there are some important differences discussed below.

Table 1: Regression results: Basic socio-economic models

	I		II		III	
	MML	Cox	MML	Cox	MML	Cox
Ethnoregional Difference Measure	6.452***	4.915***	6.165***	5.316***	6.009***	5.451***
[EDM Index]	(1.475)	(1.689)	(1.213)	(1.565)	(1.165)	(1.509)
Distance from capital city	1.164	1.688	1.104	1.790**	1.069	1.800**
[km., log.]	(0.803)	(1.008)	(0.723)	(0.705)	(0.723)	(0.750)
GDP per capita	-1.548**	-1.435	-1.816***	-2.219***	-1.902***	-2.558***
[USD PPP, 2000]	(0.663)	(0.809)	(0.654)	(0.753)	(0.658)	(0.816)
Hydrocarbon deposits	1.081	1.311**	1.279**	1.807***	1.412**	2.206***
[Dummy variable]	(0.590)	(0.552)	(0.551)	(0.381)	(0.555)	(0.415)
Democracy	0.158***	0.124***	0.209***	0.177***	0.199***	0.172***
[Polity IV index]	(0.057)	(0.034)	(0.058)	(0.037)	(0.057)	(0.044)
Democracy-squared	-0.009	-0.010	-0.007	-0.011	-0.005	-0.009
	(0.013)	(0.016)	(0.013)	(0.016)	(0.013)	(0.016)
Relative GDP per capita	-0.301	-0.157			-0.316	-0.378***
[PAD ratio to national average]	(0.616)	(0.311)			(0.378)	(0.107)
Horizontal inequality			3.971***	3.873***	4.127***	4.679***
[HI Index]			(1.279)	(0.860)	(1.295)	(1.233)
Polity duration	-2.114		-3.113		-3.138	
[Decay function]	(1.482)		(1.686)		(1.685)	
Previous attempt at secession	2.275***		2.471***		2.487***	
[Dummy variable]	(0.719)		(0.610)		(0.594)	
Ongoing conflict elsewhere	-0.514		-0.624		-0.596	
In country[Dummy variable]	(0.593)		(0.574)		(0.563)	
Constant	-7.190		-7.640*		-6.956	
	(4.244)		(3.679)		(3.758)	
Log likelihood	-132.567	-78.556	-128.181	-73.633	-127.779	-72.668
N. Observation	12840	13005	12840	13005	12840	13005
N. Level 2 Groups/Subjects (PADs)	616	1000	616	1000	616	1000
N. Level 3 Groups/Clusters (Countries)	30	30	30	30	30	30

Notes: Standard errors reported in brackets; Cox proportion hazard results stratified on dummy variables for previous attempt at secession and ongoing conflict elsewhere in the country; significance level indicated by asterisks: *<0.05 **<0.025 ***<0.01.[6]

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[5] The sign varies for the squared polity index, but as the coefficient is close to zero (either way), this hardly matters.
[6] The number of subjects in the Cox analysis is much larger than the number of groups in the MML analysis, although both are based on the PAD observation level, because the Cox specification requires

The control variables perform broadly as expected. The EDM index is positive and strongly significant in all model specification, with a large and largely consistent coefficient: regions with ethnoreligiously distinct populations are, unsurprisingly, considerably more like to experience secession (Figure 1). Distance from the capital region is similarly consistently positive, although only statistically significant in two of the Cox estimations. National level GDP per capita is also, as expected, negatively correlated with secessionist conflict at a generally high level of statistical significance, with the exception of the Cox estimation of the first model. Democracy is positively and strongly significantly correlated with secessionist conflict across all models, while the democracy-squared index is consistently insignificant with a coefficient close to zero. This confirms the studies cited earlier which suggest that patterns of secessionist conflict do not follow the inverted-U relationship with democracy identified for broader definitions of conflict but, rather, secessionism is more strongly associated with higher levels of democracy, although it is important to bear in mind that some very non-democratic states with secessionist movements are absent from the model due to data limitations – including, notably, Myanmar – and this may have affected the results here.

The controls for temporal and event dependence are similarly consistent in their results. Both the dummy variable for the presence of an ongoing conflict elsewhere in the country and the polity duration decay function are negative but not statistically significant across all models. The within-subject event dependence dummy (previous attempt at secession) is, however, strongly positively correlated with secession onset in the MML models.

Turning to the main variables of interest in this table, the measures of spatial disparity in GDP per capita, model I includes the `relgdp` ratio of PAD-level GDP per capita to the national average; model II includes the Horizontal Inequality index `hineq` and model III includes both variables. In model I, the GDP per capita ratio has a negative coefficient but is not significant in either the MML or Cox estimations. Moreover, this model is also the most inconsistent of the three across the other variables, reporting a significant coefficient on the national GDP per capita variable in the MML estimation but not in the Cox estimation, and vice versa for the hydrocarbon deposits dummy. Model II, however, reports a large positive effect of the non-linear horizontal inequality index of GDP per capita disparity, which is strongly significant in both estimations. The dummy variable for hydrocarbon deposits is also positive and significant in both estimations. When both measures of spatial disparity are included (model 3), the horizontal inequality index retains its level of significance with a similar coefficient across both the MML and Cox estimations, while the relative GDP per capita ratio is negative, as in model I, but the significance is inconsistent, with a high level of significance in the Cox estimation but well below normal benchmark significance in the MML estimation.

that a PAD constitute a 'new' subject if there has been a regime transition or previous attempt at secession.
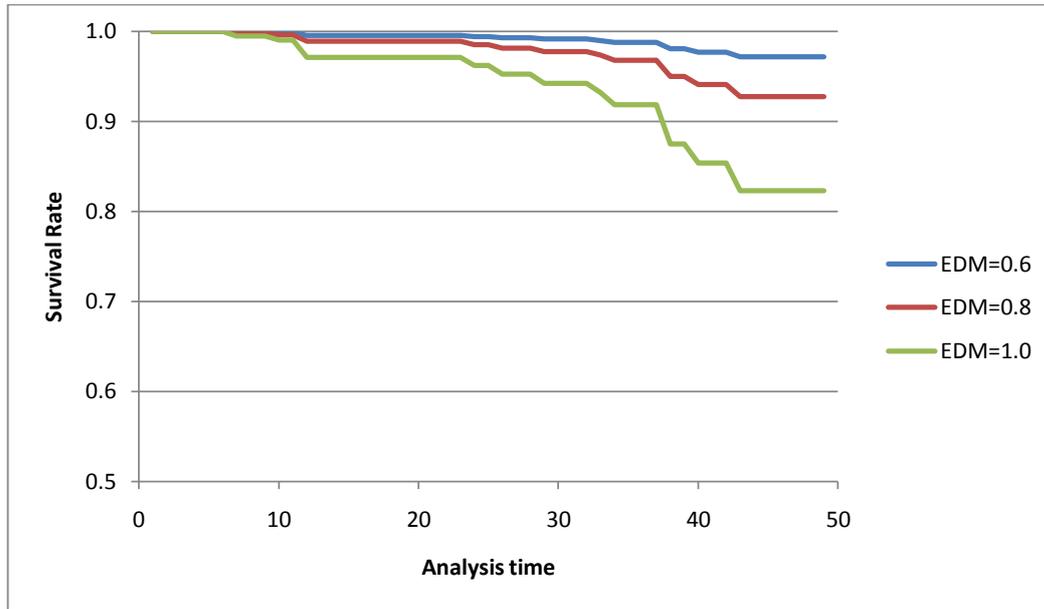
Figure 1: Estimated Survival Rate of PADs without previous attempted secession at different levels of ethnoregional difference

Notes: Derived from Cox estimation in model II; all other variables held at mean value; strata variables held at 0.
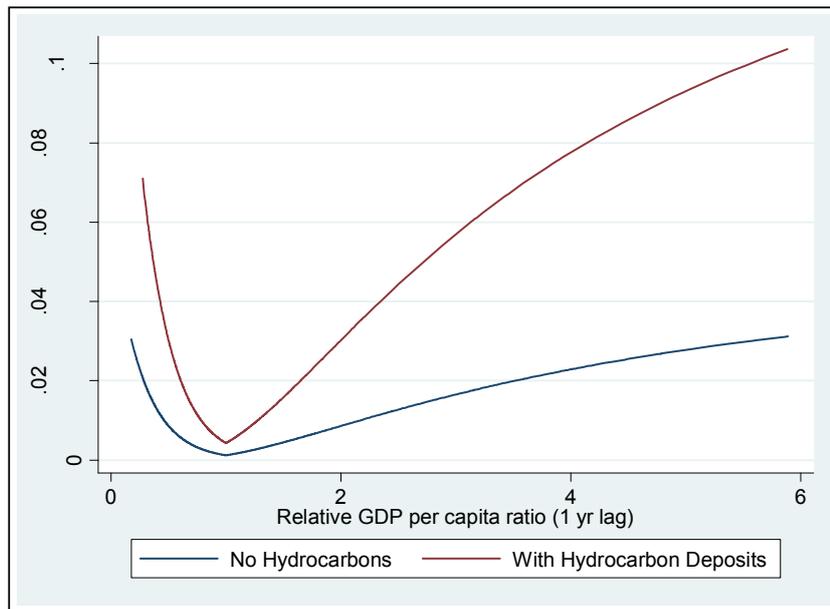
Figure 2: Probability of secessionist onset by relative GDP per capita ratio and presence of hydrocarbon resources, Model II

Notes: Derived from MML estimation in model II. Dummy variables for previous secession and other ongoing conflict set to 0; all other variables held at mean.

The results in Table 1, then, provide strong confirmation for the non-linear horizontal inequalities hypothesis – secessionism is not just the 'rage of the rich', but is also related to relative deprivation – with a particular prevalence in regions with hydrocarbon deposits. Figure

2 graphs the impact of regional horizontal inequality on the predicted risk on secessionism onset for an otherwise average PAD without previous experience of secessionism; for ease of interpretation, the `hineq` variable has been transformed back into the GDP per capita ratio.

Turning to the political theories of secession, Table 2 reports results for the horizontal inequalities model II with the fiscal decentralization and subnational elections variables added separately (model IV and V respectively) and together (model VI). The estimated impact of fiscal decentralization returns a small positive coefficient that is statistically insignificant in all estimations. In addition, its inclusion renders the democracy variable insignificant across both MML and Cox estimations; and render the national GDP per capita variable insignificant in the MML estimations. These results are probably partially explained by the inadequacies of the fiscal decentralization data. There are also, however, theoretical reasons which may explain the lack of significance of these results; as noted above, existing studies suggest that the impacts of decentralization are highly contingent on other factors. In this respect, Table 3 reports the results of interaction models, with each of the decentralization variables interacted against the ethnic difference and horizontal inequalities variables in turn. Interacting fiscal decentralization with the level of horizontal inequality (VII) produces a null result: a small and statistically insignificant result on the interaction term; the HI variable retains its strong positive effect, and the fiscal decentralization measure remains insignificant. The interaction of fiscal decentralization with the level of ethnoregional demographic difference does, however, produce noticeable differences. In this model (VIII), the coefficient on the EDM index more than trebles its impact while remaining highly statistically significant, the measure of fiscal decentralization now gains statistical significance with a positive coefficient, while the interaction between these two variables is negative and again statistically significant, although only with a relatively low significance in the MML model. Figure 3 maps the effect of these interaction effects on an otherwise 'average' PAD. Even at the relatively high level of ethnic difference EDM = 0.7, the impact of the interaction term is insufficient to outweigh the positive coefficient on the measure itself, and increased fiscal decentralization at this level of ethnoregional difference is hence predicted to increase the risk of secessionism. It is only where the EDM measure nears its maximum – that is, where the PAD in question is almost entirely populated by groups that do not live in other parts of the country – that the negative interaction effect takes over and fiscal decentralization has a conflict mitigating impact.

While fiscal decentralization is only a significant correlate of secessionism in interaction, the measure of political decentralization – the dummy variable for subnational governmental tiers with 'residual powers' – is strongly significant and has a sizeable negative coefficient in the non-interacted model (Table 2, Model VI). Once again, however, the inclusion of the political decentralization variable renders the national GDP per capita and Polity Index measures statistically insignificant, although the coefficient on the Polity Index in fact increases slightly.

Table 2: Regression results – Basic political institutions models

|	IV		V		VI	
	MML	Cox	MML	Cox	MML	Cox
Ethnoregional Difference	5.667***	5.123***	6.429***	5.290***	5.921***	5.513***
[EDM Index]	(1.446)	(2.001)	(1.464)	(1.459)	(1.490)	(2.047)
Distance from capital city	0.522	1.757**	2.197**	2.939**	0.578	1.759**
[km., log.]	(0.991)	(0.755)	(0.933)	(1.242)	(1.100)	(0.783)
GDP per capita	-1.841	-4.014***	-0.612	-1.109	-0.276	-3.931***
[USD PPP, 2000]	(0.956)	(0.824)	(0.698)	(0.696)	(1.143)	(1.259)
Hydrocarbon deposits	1.805*	2.274***	1.784***	2.198***	2.126**	2.279***
[Dummy variable]	(0.836)	(0.180)	(0.632)	(0.284)	(0.880)	(0.201)
Democracy	0.108	0.088	0.313***	0.230***	0.142	0.088
[Polity IV index]	(0.115)	(0.161)	(0.074)	(0.047)	(0.111)	(0.157)
Democracy-squared	-0.008	-0.053**	-0.027*	-0.022	-0.033	-0.053**
	(0.018)	(0.022)	(0.014)	(0.017)	0.023	(0.021)
Horizontal inequality	4.067**	4.285**	4.660***	3.700***	4.872**	4.281**
[HI Index]	(1.693)	(1.778)	(1.417)	(0.845)	(1.912)	(1.737)
Fiscal decentralization	0.050	0.014			0.068	0.015
[per cent of gov. exp.]	(0.036)	(0.045)			(0.036)	(0.040)
Subnational government			-3.627***	-2.979***	-2.731	-0.076
[Dummy variable]			(1.238)	(1.040)	(1.617)	(1.569)
Polity duration	-0.459		-2.797*		-0.991	
[Decay function]	(1.830)		(1.404)		(1.735)	
Previous attempt at secession	2.793***		2.340***		2.619***	
[Dummy variable]	(0.664)		(0.705)		(0.653)	
Ongoing conflict elsewhere	0.264		-0.689		0.236	
In country[Dummy variable]	(0.638)		(0.581)		(0.632)	
Constant	-7.294		-14.48***		-12.374**	
	(4.930)		(4.711)		(5.228)	
Log likelihood	-70.838	-32.398	-120.590	-70.217	-69.242	-32.397
N. Observations	7923	8889	12840	13005	8220	8889
N. Level 1 Groups/Subjects	492	859	616	1000	492	859
N. Level 2 Groups/Clusters	23	23	30	30	23	23
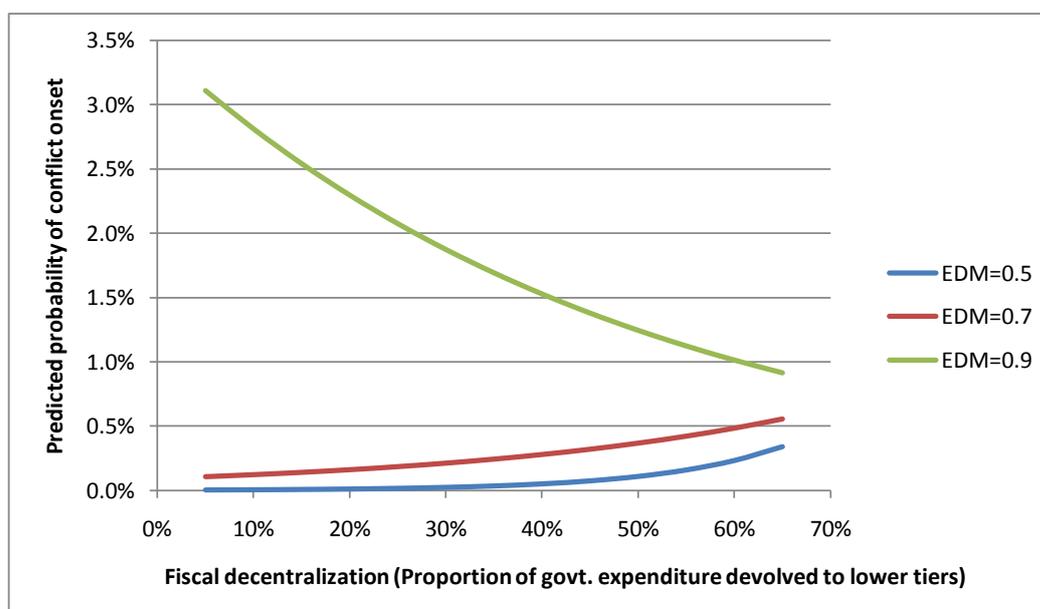
Figure 3: Probability of secessionist onset by level of fiscal decentralization interacted with ethnoregional difference

Table 3: Regression results –Political institutions models with interaction terms

	VII		VIII		IX		X	
	MML	Cox	MML	Cox	MML	Cox	MML	Cox
Ethnoregional Difference	5.408***	5.094*	18.240***	19.516***	5.946***	5.054***	5.550***	5.030***
[EDM Index]	(1.450)	(2.456)	(6.870)	(3.829)	(1.344)	(1.571)	(1.276)	(1.583)
Distance from capital city	0.622	1.349	0.188	1.116	1.648	2.987*	1.587	2.961*
[km., log.]	(0.929)	(1.228)	(0.920)	(0.774)	(0.924)	(1.440)	(0.902)	(1.461)
GDP per capita	-2.543	-3.718***	-3.200*	-4.072***	-1.537	-0.855	-1.777	-1.002
[USD PPP, 2000]	(1.384)	(1.347)	(1.571)	(1.096)	(0.921)	(0.700)	(0.912)	(0.671)
Hydrocarbon deposits	2.177***	2.000***	2.602***	3.338**	1.580**	2.102***	1.633***	2.263***
[Dummy variable]	(0.804)	(0.377)	(1.017)	(1.440)	(0.622)	(0.246)	(0.609)	(0.244)
Democracy	0.094	0.064	0.191*	0.092	0.237***	0.221***	0.237***	0.226***
[Polity IV index]	(0.097)	(0.187)	(0.096)	(0.166)	(0.060)	(0.054)	(0.057)	(0.056)
Democracy-squared	-0.027	-0.051***	-0.025	-0.062***	-0.019	-0.024	-0.018	-0.022
	(0.022)	(0.017)	(0.023)	(0.020)	(0.014)	(0.017)	(0.014)	(0.017)
Horizontal inequality	6.689*	4.445***	4.571	4.409	4.032***	3.136***	4.467***	3.441***
[HI Index]	(3.331)	(1.357)	(1.879)	(2.701)	(1.458)	(0.806)	(1.393)	(0.861)
Fiscal decentralization	0.085	0.026	0.197**	0.222***				
[per cent of gov. exp.]	(0.048)	(0.078)	(0.091)	(0.064)				
Subnational government					-15.422	-13.57***	-5.4186	-5.132***
[Dummy variable]					(15.963)	(4.278)	(7.686)	(0.826)
Interaction term: Fiscal decent. * HI Index	-0.099	-0.016						
	(0.088)	(0.092)						
Interaction term: Fiscal decent. * EDM Index			-0.242*	-0.283***				
			(0.123)	(0.043)				
Interaction term: Subnational govt * HI Index					18.338	15.862**		
					(21.059)	(6.367)		
Interaction term: Subnational govt * EDM Index							5.846	5.515***
							(8.274)	(0.798)
Polity duration	0.157		0.023		0.017		0.021	
[Decay function]	(0.017)		(0.020)		(0.012)		(0.013)	
Previous attempt at secession	2.052***		2.222***		2.076***		2.184***	
[Dummy variable]	(0.579)		(0.660)		(0.738)		(0.734)	
Ongoing conflict elsewhere	-0.260		-0.457		-0.173		-0.196	
In country[Dummy variable]	(0.282)		(0.639)		(0.299)		(0.294)	
Constant	-5.716		-10.275		-9.987		-8.996	
	(6.221)		(7.785)		(5.104)		(5.037)	
Log likelihood	-82.354	-30.769	-67.934	-27.854	-120.884	-68.856	-119.506	-67.467
N. Observations	8316	8889	8220	8889	12840	13005	12840	13005
N. Level 2 Groups/Subjects	492	859	492	859	616	1000	616	616
N. Level 3 Groups/Clusters	23	23	23	23	30	30	30	30

6   Discussion and conclusions

Quantitative analyses of civil conflict are still very much influenced by the early works of Fearon and Laitin (2003) and Collier and Hoeffler (2004), which concluded that both ethnic diversity and inequality were not good predictors of conflict incidence. By focusing on a subset of violent civil conflicts and disaggregating at the subnational level, the results presented here contribute to the increasing evidence that both ethnic diversity and inequality *do* play an important role in fostering the circumstances for violent conflict. The results suggest that country-level analyses typically do not pick up a strong relationship between ethnic diversity and conflict because they do not cater for the *geography* of ethnic diversity.

Similarly, these results suggest that the typical quantitative non-finding of a relationship between inequality and conflict is due to consideration of the 'wrong type' of inequality. Of the

different socio-economic theories of secession outlined above, the results provide strong evidence for the non-linear horizontal inequalities hypothesis, echoing Horowitz's earlier typology. Both relative regional wealth and relative regional poverty are important predictors of secession, especially when accompanied by natural resources, here proxied by hydrocarbon deposits.

While the socio-economic correlates of secessionism are relatively straightforward, however, the results presented here confirm a much more complex relationship between political institutions and the incidence of secessionism. The typical inverse-U relationship between democracy and violent conflict does not appear to hold when we consider only secessionist conflicts. There is some evidence of a linear relationship between higher levels of democracy and greater susceptibility to secessionist conflict, although this finding is not robust to all model specifications. The evidence of impacts of fiscal and political decentralization is likewise inconsistent, but appears to be primarily contingent upon the level of ethnic distinctiveness. Notably, the interaction effects here are in opposite directions. Fiscal decentralization increases the risk of secession in regions of relatively low ethnic distinctiveness, but decreases it in regions of high ethnic distinctiveness. In contrast, the impact of political decentralization appears to exacerbate the risk in highly distinctive regions, but mitigate in less distinctive regions. This confirms that debates over the relative merits or demerits of 'federalism' as a conflict mitigation strategy are misplaced and that greater attention is necessary to the nature of the decentralized institutions.

There are obviously several major limitations to the interpretation of these results. The first, mentioned above, is the geographical spread of the cases included. Without significant representation from sub-Saharan African and central Asian countries, we must be careful generalizing too much from these results. This may be of particular relevance to the findings on political institutions, as sub-Saharan Africa in particular accounts for a substantial proportion of the low-democracy countries and the failure to pick up an inverse-U relationship may be affected by their exclusion. Another limitation relates to the internal dynamics of secessionist regions. Both Horowitz (1985) and Brown (2008) argue that the relationship between horizontal inequality and secessionism operates on two levels—regionally, which is captured by the data here—and ethnically, which is not. The relative socio-economic position of regionally-concentrated ethnic groups *within* their 'home' regions hence may be an important explanatory variable that this study has been unable to capture. Nonetheless, the results presented here provide strong empirical evidence of a causal relationship between horizontal inequalities and secessionist conflict, as well as demonstrating the methodological advantages of disaggregating both the nature of 'conflict' itself and the unit of analysis for quantitative investigation.

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