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# Disarming Fears of Diversity:
## Ethnic Heterogeneity and State Militarization, 1988–2002[*]

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# Disarming Fears of Diversity:
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We address the question of state militarization under conditions of ethnic and other diversity. 'Primordialist' claims about ancient hatreds, fear, and insecurity in such societies would lead one to expect that fractionalization, polarization and ethno-nationalist exclusion would prompt governments to militarize heavily. However, contrary to such expectations, we find that higher levels of ethnic diversity predict *lower* levels of militarization, whereas higher polarization and ethno-nationalist exclusion trigger neither lower nor higher levels of militarization. If fractionalization lowers the hazard of civil war, as many find, then it does not happen via a "garrison state" effect. We discuss two potential explanations for our findings, one drawing from the empirical conflict literature, the other stemming from economists' study of public goods provision under conditions of diversity. We argue that our findings are best seen as consistent with and complementary to the empirical literature on conflict onset and duration.

The nature of many of the armed conflicts following the end of the Cold War refocused attention on the consequences of ethnicity, religion, and other forms of cultural heterogeneity[1] on social outcomes (Alesina et al. 2003; Collier 2001a; Ellingsen 2000; Fearon and Laitin 2003; Fox 2004; Gurr 1993; Harrison and Huntington 2000; Horowitz 1998; Ramet 2004; Reynal-Querol 2002; Sambanis 2001; Varshney 2001; Wimmer et al. 2004).[2] The focus on ethnicity and religion surely intensified following the 9/11 terrorist attacks in the US, although the tradition of explaining Third World violence in the years after World War II as ethno-nationalist rebellion under conditions of weak states has deep roots (Drake 1957; Gurr 1970; Huntington 1968). The popular wisdom is that ethnic and, if less so, religious conflict are 'endemic' and 'everywhere on the rise'.[3] Theories built around the concepts of ethnicity, religion and security dilemmas are particularly prominent in the literature (Kaufmann 1996; Petersen 2001; Posen 1993; Snyder and Jervis 1999; Walter and Snyder 1999). Ethnic and religious conflict occurs because groups are unable to coordinate mutual security fears (Woodward 1995), particularly over questions of national integration and exclusionary politics (Cederman and Girardin 2005; Wimmer 1997), leading to relative deprivation and spirals of dissent, repression, and outright violence.

Some theories of ethnic fractionalization and polarization argue that violence may occur because of the ways in which state power is distributed that allow some to access state resources to greater extents than others (Caselli and Coleman 2006). If a majority hogs state power, then it has an incentive to militarize in order to prevent a challenge from other groups. This would lead to cycles of repression, causing security dilemmas (Kaufmann 1996; Posen 1993; Snyder and Jervis 1999). In fact, the idea of an ethnic security dilemma borrows heavily from the international relations literature where states operating in an anarchical international system are driven to seek security, but create insecurity among others in so doing. The concept of an ethnic security dilemma is applied in the situation where states have collapsed and ethnic groups

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[1] We use the terms heterogeneity, diversity and fractionalization interchangeably.

[2] It is reported that one English-language scholarly journal database records 249 articles published since 1990 containing 'ethnic conflict' in the title as opposed to just 23 with 'class conflict' (Gilley 2004: 1155).

[3] See Kaplan (1994) for a recent explication of the primordialist argument that suggests ethnic and, more broadly, cultural conflict to be endemic. Huntington's (1993, 1996) hypothesis of a *Clash of Civilizations* provides a related argument. Others report that the incidence of ethnic conflict and inter-communal violence is declining (Gurr 2000).

apparently go from cooperation to violence because of mutual fears about the intentions of others. However, the reasons for state collapse and the events that drive the security dilemma are artificially separated in this literature (Roe 2000). In any case, it is not just the rhetoric of nationalist leadership that ethnic groups and others fear, but also their actions, which are almost always explicitly demonstrated by military means. The military is also an important source of patronage and power. Powerful groups can use ethnic nepotism to gain from controlling military purse strings.[4] Thus, ethnic conflict could very well be one aspect of a cocktail that includes ethnicity, corruption, and militarization.

This paper explores whether ethnic, linguistic and religious diversity leads to militarized societies. Specifically, ethnicity and other diversity could lead to security concerns to which governments respond with higher militarization. We test this proposition employing several measures of fractionalization and polarization on three indicators of state and social militarization reflected in military expenditures, the share of military personnel in the labor force, and arms imports. Additionally, we also employ a measure of ethno-nationalist exclusion, currently only available for a limited group of countries (Cederman and Girardin 2005).

Our results are easily summarized. We find that ethnic heterogeneity predicts lower rather than higher levels of military spending to GDP between 1988 and 2002, controlling for several salient factors, such as country size, income, regime type, security risks, armed conflict etc. If states fear ethnic heterogeneity, it does not show in terms of how they prepare to deal with it. The result is robust to sample size and several different specifications and testing procedures. Ethnic heterogeneity is also negatively related to the share of military personnel in the total labor force. Since most poor countries are likely to follow more labor-intensive militarization strategies, the negative relationship between heterogeneity and the share of military personnel in the labor force is also instructive. More ethnically diverse countries are also estimated to have lower arms imports to total imports. Religious heterogeneity had no statistically significant effect in any of the tests, which confirms existing studies that fail to find an effect of religious heterogeneity on either growth or institutional quality. In one set of estimations, it seems to be linguistic rather than ethnic heterogeneity that diminishes militarization, but Alesina et al.'s

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[4] Some report that corruption increases military spending (Gupta, de Melo, and Sharan 2001) and others that ethnicity increases corruption (Alesina et al. 2003; La Porta et al. 1998), although no one has analyzed the effects of diversity on military spending itself.

(2003) linguistic fractionalization measure is highly correlated with ethnic fractionalization as measured by others. Furthermore, we fail to find evidence that alternative measures of ethnic and religious polarization or ethno-nationalist exclusion lead to state militarization.

The results taken together do not suggest that governments 'run scared' because of ethnic and other diversity – quite the opposite. The results do not support those who contend that ethnic diversity is predisposed to spur militarization due to security fears. Neither do the results support a conjecture that heterogeneous societies remain peaceful because states militarize to prevent violent conflict. Realist theories in particular argue that ethnic conflict in Eastern and Central Europe was kept in check by Soviet military might, only to erupt with the withdrawal of Soviet power (Huntington 1993; Mearsheimer 1990). If in fact diversity is a source of potential violent conflict, it does not seem likely that peace prevails purely because of a 'garrison state' effect. We find exactly the opposite of this expectation regarding state behavior under conditions of ethnic and other diversity.

As possible explanations for our results we draw on and critically discuss two important strands of literature. One is the empirical literature on conflict onset and duration, which finds that ethnic and religious fractionalization does not predict a higher risk of civil war (Fearon and Laitin 2003; Mueller 2000). If anything, high diversity makes countries safer, or in other words, ethnic dominance (Collier 2001a; Collier and Hoeffler 2004a) or ethnic polarization (Montalvo and Reynal-Querol 2005) is what matters, not ethnic fractionalization. If rational policy makers anticipate that more diverse countries are less prone to conflict, then there is also less reason to militarize. The second literature stems from scholars interested in governance and public spending who find that heterogeneity leads to lower provision of public goods, such as education, health, and infrastructure. Since diversity poses problems for arriving at a consensus for co-operative solutions (a question of governance under diverse preferences), the greater the diversity the worse the policy outcomes (Alesina, Baqir, and Easterly 1999; Alesina et al. 2003; Easterly 2001). If one regards militarization as a means for the provision of the public good security, then one could argue that diverse societies encounter the same difficulties of collecting taxes, forging political support, or reaching the social consensus required for militarization as they do for the provision of other public goods. We discuss these two strands of literature and argue why we regard the first one to be the more promising candidate for explaining our findings.

The next section provides a detailed exposition of our research design. This is followed by a presentation of results, which are then subjected to a battery of sensitivity tests. The penultimate section discusses two competing potential explanations for our findings before we draw out the implications of our findings in the concluding section.

## Research Design

*The dependent variables*

We employ a pooled time-series, cross-section (TSCS) data set. Our main dependent variable consists of military expenditures over GDP (*Military expenditures*), which the literature usually refers to as the defense burden. We keep this variable in its level form, but our main results are hardly affected if it is logged instead. Collier and Hoeffler (2004b) come to the same conclusion in their study. The data are taken from (World Bank 2004), which is also the source for the other variables unless noted otherwise. They are available annually from 1988 up to 2002, a total of 15 years. Combining various sources one could in principle construct a panel that reaches further back in time. However, given measurement and international and inter-temporal comparability problems with military expenditure data, particularly during the period of the Cold War (Brzoska 1995), we prefer to use one single data source that largely covers only the post-Cold War period. This is of course also the period in which so-called ethnic conflict is supposed to be particularly prevalent. The recent data are also much more reliable given improved standards for collecting data and higher levels of transparency due to democratization and international pressure (Omitoogun 2003). The World Bank data originally come from the Stockholm Peace Research Institute's (SIPRI) series of *Yearbook: Armaments, Disarmament and International Security* and are almost identical to data supplied to us directly by SIPRI (r = .98).

In addition, we use two other variables capturing different aspects of militarization to check the robustness of our results. The second dependent variable is military personnel as a share of the total labor force (*Military personnel*), which has slightly lower data availability compared with military expenditures. The advantage of using the share of military personnel in addition to military spending is that poor countries may simply use labor-intensive (rather than capital-intensive) forms of militarization. Lastly, we use a variable measuring arms imports relative to total imports (*Arms imports*). This variable is only available up to 1999 and in principle arms import expenditures should be included in total military expenditures. However,

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for some countries arms imports are not accounted for in military expenditures (Brzoska 1995) and a high arms to total imports ratio provides yet another feature of a highly militarized society. These data have their origin in the U.S. Department of State's *World Military Expenditures and Arms Transfers* reports and are taken from (World Bank 2003).[5]

*The main explanatory variables*

Our primary independent variable is ethnic heterogeneity, which has received a great deal of attention in the recent empirical literature in several fields, particularly in political science, sociology, and economics (Alesina et al. 2003; Fearon 2003). As a result, the measures have improved tremendously over the measure of ethno-linguistic fractionalization previously developed by Soviet social scientists in the 1960s and used in early studies. Defined as the probability that two randomly selected individuals from the same country belong to different ethnic or linguistic groups, heterogeneity is computed as $ELF \equiv 1 - \sum_{i=1}^{n} p_i^2$, where $p_i$ is the population share of ethnic or linguistic group $i$ and $n$ is the number of existing groups. This measure of ethno linguistic fractionalization (ELF) mixed ethnic and linguistic characteristics. Recently, however, Alesina et al. (2003), Montalvo and Reynal-Querol (2005), Fearon and Laitin (2003) and Fearon (2003) independently constructed new measures of ethnic, religious as well as, in the case of Alesina et al. (2003), linguistic fractionalization (*Ethfrac (Alesina et al.), Relfrac (Alesina et al.), Linfrac (Alesina et al.)*, *Ethfrac (Montalvo & R.-Q.)*, *Relfrac (Montalvo & R.-Q.)*, *Ethfrac (Fearon & Laitin)* and *Relfrac (Fearon & Laitin)*). They use the same formula, but improve upon the older data significantly. These data series are based on more current, updated sources, and do not conflate ethnic, religious and linguistic characteristics in a single measure as blatantly as the old ELF measure. They also rely on survey-based studies that have examined several African countries where distinction of groups is not always straightforward. While there are several definitional and operational differences in their methods, Fearon (2003: 196) claims that his measure is 'broadly similar' to Alesina et al's (2003) measure. Both these measures are highly similar to Montalvo and Raynal-Querol's (2005) measures of

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[5] There is one data point of more than 100 per cent (Ethiopia 1989), which can happen if there are inconsistencies in the reporting and measurement of arms as well as total imports. Dropping this observation from the sample had little impact on the results.

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fractionalization (*Ethfrac (Montalvo & R.Q.)* and *Relfrac (Montalvo & R.Q.)*). In addition to these three sources, Roeder (2001) has developed an ethno linguistic fractionalization index (*Ethfrac (Roeder)*), which is mainly on the original Soviet sources from the 1960s together with other Soviet ethnographic studies from the 1980s.

We primarily rely on Fearon's (2003) and Fearon and Laitin's (2003) widely used measures of ethnic and religious fractionalization. We also use the alternative measures to test the robustness of our results, a strategy advocated by both Fearon (2003) and Alesina et al. (2003). Additionally, Montalvo and Reynal-Querol (2005) argue that it is polarization rather than fractionalization that matters. It measures "the normalized distance of a particular distribution of ethnic and religious groups from a bimodal distribution" (see Montalvo and Reynal-Querol 2005: 301 for details). It is computed as $P \equiv 1 - \sum_{i=1}^{n} \left( \frac{.5 - p_i}{.5} \right) p_i$ , where $p_i$ is again the population share of group $i$ and $n$ is the number of existing groups. Polarization approaches unity when the population is made up of two equally sized groups and then declines as the number of groups increases further, whereas fractionalization increases monotonically with the number of groups. Empirically, across countries ethnic polarization (*Ethpol (Montalvo-R.Q.)*) is related to ethnic fractionalization in a non-linear way: Ethnic polarization first rises with increasing fractionalization, but then falls at an intermediate level of fractionalization. Religious polarization (*Relpol (Montalvo-R.Q.)*) is somewhat different; it first increases as fractionalization increases and then at higher levels of fractionalization there is no relationship to polarization. See Montalvo and Reynal-Querol (2005) for a detailed discussion. Thus, we also test ethnic and religious polarization in our models of militarization.

Recently, Cederman and Girardin (2005) have criticized conflict scholars for using measures of ethnic fractionalization and polarization, arguing that these measures fail to capture the essence of ethnic conflict. In their view, what matters are not relative group sizes, but which group of which size holds state power and which demographically significant ethnic groups are excluded from state power. From this premise, they develop an index of ethno-nationalist exclusion (*Ethexclusion*) with an ethnic group in power in the center, interacting in a star-like fashion with each non-governmental ethnic group, but without interaction of the non-governmental groups with each other. Whereas the fractionalization and polarization indices take on the same value whether or not an ethnic majority or minority holds state power, Cederman

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and Girardin's index leads to drastically different values for such constellations with larger values for smaller ethnic group holding state power at the exclusion of larger ethnic groups from state power. The authors find that their index is a statistically significant predictor of civil war onset. Unfortunately, due to data limitations, their index is currently only available for Eurasian and North African countries.

Table 1 provides a correlation matrix for the various measures of fractionalization and polarization used. There is clearly often strong correlation among the various measures, but they are far from identical. We conclude that it is important to test the various available measures if we want to ensure robustness of our results. Due to the limited country coverage of Cederman and Girardin's (2005) *Ethexclusion* measure, it is not included in this table. However, they report a bivariate correlation coefficient of .42 and .36 with *Ethfrac (Fearon & Laitin)* and *Ethpol (Montalvo-R.Q.)*, respectively, which are fairly low as one would expect, given its different conceptual basis.

*The control variables*

Turning to control variables, there is an enormous theoretical and empirical literature that has accumulated on the causes and consequences of military spending (Gleditsch et al. 2000; Hartley and Hooper 1990). Most of these studies have focused on arms races between the superpowers, or are case studies of single countries over time. We rely primarily on two recent empirical studies addressing the determinants of military spending (Collier and Hoeffler 2002; Goldsmith 2003), namely Collier and Hoeffler's (2004b) study of military expenditures in five-year averaged periods from 1960-1999 and Goldsmith's (2003) study of military spending over the period 1886 to 1989, none of which addressed ethnic and other diversity, however.

We control for the level of per capita income in purchasing power parity (*GNI p.c.*) as well as its growth rate (*Economic growth*), which are commonly used variables (Davoodi et al. 2001; Goldsmith 2003; Gupta, de Melo, and Sharan 2001). We log GNI p.c. to reduce skewness. Most find that income is positively related to higher expenditures, arguing that wealth allows governments the greater luxury of stronger defense (Collier and Hoeffler 2002). In economic terms, military spending is likely to be a normal good, that is a good with a positive income elasticity (Sandler and Hartley 1995). High economic growth rates might make it easier for governments to impose a greater defense burden on society. We use total population (logged) to control for country size because this influences both ethnic heterogeneity and militarization

(*Population*). Collier and Hoeffler (2004b) report a negative effect of country size as measured by population on military budgets, arguing that large countries deter external threats. We control for regime type (*Polity*) using the POLITY IV dataset's polity2 indicator, which uses a weighting scheme to treat periods of transition ([www.cidcm.umd.edu/inscr/polity/](http://www.cidcm.umd.edu/inscr/polity/)). We expect autocracies to have higher military spending than democracies (Collier and Hoeffler 2002; Goldsmith 2003). Many have argued that autocracies are dependent on military force to sustain their rule against attempts to overthrow their government, whereas democracies command a greater degree of legitimacy and are thus less in need of a strong military (Kimenyi and Mbaku 1995; Maizels and Nissanke 1986). We additionally control for overall government spending (*Government expenditures*), since high government consumption generally will have the same causes as high military spending.

Next, we control for internal and external security threats as militarization variables will be driven by such factors (Collier and Hoeffler 2002). We enter a term for *Civil war*, which is a dummy variable for years in which a country experiences armed conflict with over 25 battle-related deaths (Gleditsch et al. 2002). Following Goldsmith (2003), the international war variable is a dummy for years in which a country engages in conflict between states with at least 1000 deaths (*International conflict*). These data are taken from (Gleditsch et al. 2002). We also compute a count of civil and international peace years (*Peace years (civil war)* and *Peace years (int. conflict)*), or the number of years since the last civil and international war since 1946 in order to gauge the proximity of previous conflict (Collier and Hoeffler 2002). It is well established that, for civil wars at least, there is a high risk of revival even after a civil war has formally ended, which suggests that militarization after the end of civil war is likely to diminish only slowly over time (Collier and Hoeffler 2004b). Civil wars could also be endogenous to militarization. High military expenditures can deter international conflicts, but can also provoke them if foreign countries go for preventive action as Kant (1795) already pointed out more than 200 years ago (Fordham and Walker 2005). High military expenditures can signal to rebels that the initiation of a civil war is likely to end in defeat, but particularly in fragile post-conflict societies high expenditures can also increase the risk of renewed conflict if the former rebels take such expenditures as a signal for the government's willingness to renege on the peace terms (Collier and Hoeffler 2004c). For these reasons, we run tests with and without the civil war variables (incidence and peace years) included.

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Similar to Collier and Hoeffler (2004b) we take a weighted average level of militarization of countries that are "contiguous" (*Contiguous militarization*). The weight is GDP and contiguity is defined as either land contiguity or water contiguity up to 400 miles of water. Data are from the Correlates of War (COW) project and were taken from Bennett and Stam (Bennet and Stam 2003). In a context of rivalry, the militarization level of contiguous countries can capture local arms race phenomena. In a context of non-rivalry, it can capture emulation, imitation and coordination effects. The contiguous militarization variable is not without problems, however. In effect, it introduces a spatial lag into the model (Anselin 1988) and often captures variables omitted from the model (Simmons and Elkins 2004). We believe our model is relatively comprehensive, but it would be difficult to say with confidence that there are no omitted variables. For this reason, we run tests with and without the contiguous militarization variables included.

Contrary to Collier and Hoeffler (2004b), we do not include a measure of predicted civil war. Such a variable creates all kinds of statistical problems. Instead, we control for the risk of civil war directly by our range of explanatory variables, which will capture the risk of civil war under the assumption that the factors triggering such war are time-persistent. Finally, we include year-specific dummies to capture any trends over time and year-specific international tension that influences defense spending globally, such as the end of the Cold War, the Persian Gulf War, or NATO action in the Balkans. Table 2 provides summary descriptive variable information.

*The estimation method*

The estimation of TSCS data presents some special problems, particularly because of complex correlation patterns between and across panels (Beck and Katz 1995a; Beck and Katz 1995b). Since our data is unbalanced to an extent that no time periods are common to all countries in the sample, the standard version of the Panel Corrected Standard Errors (PCSE) method of Beck and Katz cannot be used. As an alternative, we therefore use a random-effects estimator with robust standard errors, assuming that observations are independent across countries, but not necessarily within countries over time, i.e. observations are assumed to be clustered. The robust-cluster option produces consistent standard errors even in the presence of serial correlation and heteroskedasticity, but it is potentially inefficient in estimation (Wiggins 1999). To ensure that results are not specific to our estimation technique, we additionally use the Generalized

Estimation Equation method (GEE) (Zorn 2001), also under the assumption of clustered observations. We would use a fixed-effects estimator were it not for the fact that our main variables of interest (ethnic fractionalization, polarization and ethno-nationalist exclusion) are time-invariant in our sample.

**Results**

Table 3 presents the results for militarization with Fearon (2003) and Fearon and Laitin's (2003) measures of ethnic and religious heterogeneity. Note that year-specific time dummies are included in the estimations, but their coefficients are not reported to save space. Column 1 reports random-effects results with the robust-cluster option and column 2 results using the GEE method.[6] As seen there, ethnic heterogeneity is negatively related to militarization across all three measures of militarization and in both testing procedures. Religious heterogeneity is not statistically significantly different from zero in any of the estimations. Substantively, holding all other variables at their mean values, raising ethnic heterogeneity by one standard deviation would reduce the share of military expenditures in GDP by almost three-quarter's of a percent (0.71), which is quite large given that the global average military burden is only 2.9% of GDP.

What about our control variables? As concerns military expenditures relative to GDP, contrary to Goldsmith (2003) who tests a longer time period, we do not find that higher per capita income predicts higher defense spending, but a higher economic growth rate allows countries to engage in higher military spending. This difference in results might suggest some influence from the Cold War period that dominates other tests. Developed and Eastern European countries have on average reduced their military spending after the end of the Cold War, whereas developing countries have not, or if they have, by smaller degrees. Democracy has a negative and statistically significant impact on military spending, thus supporting Goldsmith's (2003) and Collier and Hoeffler's (2004b) findings on democracy's effect on lower militarization. Democratic governments are able, independently of the level of fractionalization, wealth, and other controls, to focus a larger share of resources to other priorities than security, a result expected by some theorists on regimes and military spending (Russett 1990; Sprout and Sprout

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[6] Collinearity among the variables does not seem to be a problem. The average Variance Inflation Factor (VIF) score is around 2 in column 1.

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1968). This result is not likely to be driven mainly by the fact that democracies thrive in peaceful neighborhoods and autocrats thrive in violent ones, which can be deduced from the fact that we control for violent conflict.[7] Larger government consumption is also positively related to higher military expenditure. Military spending by contiguous countries and the incidence of civil war all have the expected positive sign and are statistically significant, results that are also consistent with others' (Goldsmith 2003; Gupta, de Melo, and Sharan 2001). Military expenditures decrease with a longer history of civil peace. Perhaps surprisingly, neither the incidence nor the history of international conflict seems to matter for military spending.

With respect to military personnel as a share of the labor force, neither per capita income nor the economic growth rate has a statistically significant impact. Democracy again shows a statistically significant negative effect on the share of labor devoted to security. Not surprisingly, population size is negatively related to military personnel as a share of the labor force since countries with a large population size need to allocate a smaller share of the labor force to military duties and still can have a large military in absolute numbers. Higher militarization by contiguous neighbors leads to higher militarization within the country. A longer history of civil peace leads to lower military personnel, whereas the opposite is true for the incidence of international war. The result that the incidence of international war is statistically significant for military personnel, but not for military expenditures, may suggest that governments engage in international armed conflict in a labor-intensive rather than capital-intensive way using soldiers rather than sophisticated and expensive military equipment.

Lastly, with respect to arms imports as a share of total imports, we find that higher arms imports by contiguous neighbors as well as the incidence and history of civil and international war have the predicted effect on a country's arms imports. Democracies import less arms than autocracies, but the effect is marginally insignificant in random-effects estimation. Perhaps surprisingly, arms imports are lower in countries with a higher per capita income. An explanation could be that richer countries are able to produce a larger share of their armaments domestically. Government expenditure is positively associated with arms imports, whereas the population size and the economic growth rate do not matter.

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[7] There is a large literature on the democratic peace (Russett and Oneal 2000). For neighborhoods and democracy, see (Gleditsch and Ward 2004; O'Loughlin, Ward, and Lofdahl 1998).

In tables 4 to 6, we repeat the tests conducted above, but this time using alternative measures of heterogeneity. Estimations using Montalvo and Reynal-Querol's (2005) measures of ethnic and religious fractionalization are reported in table 4 and largely mirror the results using Fearon's (2003) and Fearon and Laitin's (2003) measures: More ethnically fractionalized societies have lower military spending and lower arms imports, whereas religious fractionalization does not matter. The substantive effect of a standard deviation increase in fractionalization reduces the defense burden by almost one-half of a percent. The main difference to results in table 3 is that ethnic fractionalization, while being negatively signed, has no statistically significant effect on military personnel as a share of the labor force. Results from the main estimations reported in table 3 uphold if Roeder's (2001) ethno linguistic fractionalization index is used instead, with results reported in table 5 (note that he has not constructed a religious fractionalization measure). Employing Alesina et al.'s (2003) measures of ethnic, linguistic and religious fractionalization in table 6 suggests that linguistic fractionalization is negatively and statistically significantly related to military expenditures and arms imports, but is not statistically significant for military personnel, for which it is religious fractionalization that exerts a negative and statistically significant impact. Ethnic fractionalization remains insignificant throughout. We re-ran all tests by dropping linguistic fractionalization because it is highly correlated with ethnic fractionalization, but the results do not change much. This is not so surprising in that Alesina et al.'s (2003) linguistic rather than ethnic fractionalization measure is most highly correlated with Fearon and Laitin's ethnic fractionalization measure (r = 0.88 as opposed to r = 0.76).

To test this aspect of diversity further, we now test Fearon's (2003) measure of cultural fractionalization that adjusts his measure of ethnic fractionalization for the cultural distance between the ethnic groups using linguistic classifications of distance between major language families (*Cultfrac (Fearon)*). For example, if ethnic groups belong to two distinct language families, such as Greek and Turkish, then the cultural distance is greater compared to two groups speaking Slavic East branch and Slavic West branch. In other words, the greater the overlap of shared linguistic traits among ethnic groups, the lower the cultural distance between them and the more a country's index of cultural fractionalization will lie below its index of ethnic fractionalization. Indeed, Fearon (2003: 215) argues that "if a researcher's theory is that ethnic fractionalization matters because it makes for diverse preferences and consequent difficulties cooperating, then the measure of cultural fractionalization (...) may be more appropriate." Alesina et al (2003) concur. Table 7 repeats the estimations from table 3, but replacing ethnic

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with cultural fractionalization. Cultural fractionalization is negatively signed, but only statistically significantly related to military personnel as a share of the labor force and then only in GEE estimation, while being marginally insignificant in columns 1 to 3. Religious fractionalization remains insignificant.

Next, we also tested the hypothesis of Montalvo and Reynal-Querol (2005) that it is ethnic and religious polarization rather than fractionalization that matters. To do so, we replaced the fractionalization with their polarization measures (see table 8). Neither ethnic nor religious polarization has any impact on militarization, independent of which dependent variable is used. These results do not support the proposition that it is polarization as they have operational zed it rather than fractionalization that really matters for predicting militarization.

Finally, we analyzed the effect of Cederman and Girardin's (2005) index of ethno-nationalist exclusion on militarization – see table 9. Their index is never statistically significant. However, due to the limited country coverage of this index, one needs to treat this result with caution. If and once their measure becomes available for all countries in the world, it will be interesting to see whether it produces results that are contrary to the ones reported so far.

**Sensitivity analysis**

We ran a large number of tests of sensitivity.[8] We dropped the contiguous militarization and conflict variables to assess the effects of ethnic heterogeneity without them in the model, since these variables might suffer from endogeneity bias. When these variables are dropped, the basic results on most of the heterogeneity variables change little, but the heterogeneity variables from Montalvo and Reynal-Querol (2003) and the linguistic fractionalization variable from Alesina et al. (2003) become statistically insignificant, while maintaining their negative coefficient sign. The government expenditure variable suffers from partial identity bias since current military expenditures form part of general government expenditure. Unfortunately, current military expenditures cannot be netted out from general government expenditure since the available military expenditure data include both capital formation and current expenditures for military purposes. If we drop government expenditures from the model, then our results are hardly affected. To see whether ethnic and religious heterogeneity exerts a non-linear influence on

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[8] All results available upon request.

military spending, we repeated the estimations with squared and, in separate estimations, even cubic heterogeneity terms included. However, we found no evidence for non-linear relationships.

We followed Goldsmith (2003) and controlled for the previous year's value of the dependent variable. One can argue that military budget decisions are subject to bureaucratic inertia (Goldsmith 2003; Gupta, de Melo, and Sharan 2001). Results on our main variables of interest are little affected in terms of the sign of the coefficient and statistical significance, even though the coefficient size is of course reduced by the inclusion of a lagged dependent variable.[9] With our ethnic heterogeneity variables being invariant over time, we cannot compute a fixed effects model. However, we tried to capture some crude cross-regional heterogeneity by regional dummy variables, where the regional classification follows that of the World Bank (2004). With the exception of the region of North Africa and Middle East, which often showed a higher level of militarization, there was little evidence for systematic regional differences. Our main results were hardly affected with the exception of the heterogeneity variables derived from Montalvo and Reynal-Querol (2003) and Alesina et al. (2003), which sometimes became (marginally) insignificant, while maintaining their negative coefficient sign. In these estimations, the average weighted militarization of contiguous countries often became statistically significant as well. This is not surprising given that militarization of contiguous countries is correlated with regional levels of militarization.

Next, we limited our analyses to a sub-sample of only developing countries. The results on diversity remain very similar. The share of the population urbanized had little effect on the results when added to the models, nor was this variable statistically significant, contrary to the findings of others (Davoodi et al. 2001). The same is true for the level of aid to gross national income, which might ease the governmental budget constraint. One might wonder whether oil wealth might allow governments to achieve greater levels of militarization. Adding a dummy variable taking the value of one if oil exports reach one third of total GDP (Fearon and Laitin 2003), suggests no impact on military expenditures or military personnel, but oil has a positive and statistically significant effect on arms imports. This concurs with the fact that major oil exporters, such as the Gulf countries, have been major arms importers over the last decade or so. The results on the remaining variables were hardly affected, however. The same is true if we add a dummy variable for the 20 largest arms-producing countries based on information from SIPRI

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[9] A lagged dependent variable can potentially mask any causal effects by the other explanatory variables (Achen 2000).

to the arms imports regressions (SIPRI 2002). Major arms producers import fewer arms, as one would expect given they can satisfy parts of their arms demand by domestic production, but our main results remain valid.

In sum, there is no indication from any of the tests that fractionalization increases militarization. The same is true for polarization. These results disconfirm what we would expect to see from theoretical arguments about ethnic and other diversity, security dilemmas, fear, and militarization.

## In Search of Explanation: Why Are Diverse Societies Less Militarized?

What might explain that contrary to what one might expect given the rhetoric of ethnic and religious conflict and the supposed ensuing security dilemmas, diverse societies do not respond with higher levels of militarization? Why do governments in such societies not react in a way that many would regard as a rational response to real and/or perceived threats emanating from ethnic and other diversity?

Two strands of literature are relevant for providing potential explanations. The first comes from the empirical literature on conflict onset. Recent studies of civil war show that, contrary to conventional wisdom, ethnic diversity's role in conflict is not straightforward. Ethnicity is important of course for organization and mobilization of support, but conflict occurs when the opportunity for using violence is maximized. Some studies have shown a curvilinear association between ethnic fractionalization and conflict. Highly homogeneous and highly heterogeneous societies are both able to maintain peace. In highly homogeneous societies there is little ethnic strife, whereas a high degree of fractionalization prevents mobilization on issues. Collier (2001) argues that highly fractionalized societies will pose difficulties for large enough minimum winning coalitions to form so that groups will not be able to challenge a state's monopoly on force effectively. The trouble is in between, with moderately fractionalized societies facing the greatest danger (Collier and Hoeffler 2004a; de Soysa 2002). Others call this polarization, where two equally sized groups are the most dangerous, or in other words, where moderate fractionalization prevails, since measures of polarization are at a maximum when society is made up of two groups containing 50% of the population each (Alesina et al. 2003; Garcia-Montalvo and Reynal-Querol 2002). Moreover, if the largest minority is large enough, it is a more attractive target for expropriation by a majority, thus leading to polarized conflict and

violence (Caselli and Coleman 2006). Cederman and Girardin (2005) provide evidence that higher levels ethno-nationalist exclusion increases the risk of civil war, but due to the limited country coverage of their measure it is as yet unclear whether the effect holds for a global sample as well.

The second strand of literature stems from predominantly economists who have found that diversity negatively affects economic development and other public policy outcomes because diversity makes consensus difficult. Ethnic heterogeneity (and polarization) is seen as the underlying cause of the failure of collective action, particularly as it generates incentives for rent-seeking (Alesina 1994; Alesina and Drazen 1991; Alesina and Rodrik 1994; Garcia-Montalvo and Reynal-Querol 2005). Political economy models suggest that heterogeneity is "prone to competitive rent-seeking by the different groups that have difficulty agreeing on public goods like infrastructure, education, and good policies" (Easterly and Levine 1997: 2). This phenomenon has been demonstrated at various levels of aggregation – see, for example, Alesina, Baqir and Easterly's (1999) study of the negative impact of ethnic fractionalization on public good spending in U.S. cities and Easterly and Levine's (1997) cross-national study explaining a good part of Africa's growth tragedy with the negative effects of its high degree of ethno-linguistic fractionalization on political stability, the provision of public goods and growth-promoting policies.[10] Apparently, the diverse preferences of heterogeneous groups make it more difficult to forge public policies that benefit the collectivity. In the US city example, it is noted that white Americans prefer low taxes in cities with heterogeneous populations because of the belief that blacks benefit predominantly from spending on public goods. Africa's economic woes are directly related to the bad public policy decisions made as a result of ethnic heterogeneity, where political conflict impedes public good provision such as education and health (Easterly and Levine 1997).

Other cross-national studies show that ethnic polarization lowers investment, whereas religious polarization increases government consumption relative to GDP (Garcia-Montalvo and Reynal-Querol 2005). However, Alesina et al (2003) find that it is diversity that matters more than polarization on the question of poor economic policy and public goods provision. Possibly, the negative effects of fractionalization are mitigated in democracies (Collier 2000; 2001) or

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[10] Posner (2004) corrects Easterly and Levine's (1997) measure for ethnic groups that are politically relevant and comes to the same conclusion.

rather, as Easterly (2001) argues, where institutional quality is high, which is only weakly correlated with democracy. However, institutional quality is itself negatively affected by ethnic fractionalization (Alesina et al. 2003; Keefer and Knack 2002).

Several scholars treat military spending as a public good both regionally and within countries because if in fact it buys security, then others benefit from having to spend less given the regional nature of the consequences (Olson 1982). If this is correct, then military spending and militarization more generally would be subject to the similar detrimental consequences of diversity as other forms of public goods provision, which would be consistent with the results presented above.

Starting with the second potential explanation, we believe that whilst the results are consistent with the predictions of this literature, the negative effect of diversity on public goods provision is unlikely to be the causal mechanism at work. This is because in our view it is highly questionable whether militarization represents a public good. Security is a public good, but militarization might not provide it. Collier and Hoeffler (2004b) do not find that higher military spending deters civil conflict, whilst Collier and Hoeffler (2004c) even show that higher spending might increase rather than reduce the risk of renewed conflict in fragile post-conflict societies. Kant (1795) and other liberals believe that military expenditures and other forms of militarization are likely to be excessive and indeed often dangerous as they spur rather than deter conflict and lower rather than increase security. Since democracy typically promotes public goods provision (Baum and Lake 2003; Boix 2001; Lake and Baum 2001), the interpretation of militarization as a form of public goods provision does not sit well since democracy lowers rather than increases militarization.

What about the other potential explanation? If policy makers can anticipate that ethnically and otherwise diverse societies are less rather than more prone to conflict, then there is less need to militarize in such societies and our estimated results make sense. That diversity can lead to peaceful conditions, in which high levels of militarization are not necessary, finds also support in some theoretical contributions. For example, Fearon and Laitin (1996) developed theories of interethnic cooperation built on in-group policing and fear of spirals of conflict, which might provide an explanation for the fact that highly fractionalized societies are surprisingly peaceful. Our estimations of government behavior in the military sector under conditions of diversity supports those views that suggest ways in which diversity may in fact constrain violence (Collier 2001b; Fearon and Laitin 1996; Varshney 2001).

Interestingly, the empirical literature suggests that while diverse societies tend to be more peaceful, situations of ethnic polarization and ethno-nationalist exclusion can indeed spur violent conflict. This is tentatively consistent with our findings since it is exactly for measures of ethnic polarization and ethno-nationalist exclusion for which we find no statistically significantly negative effect. Diverse societies are less militarized, but polarized societies are not. Neither are societies with strong levels of ethno-nationalist exclusion, but due to the limited country coverage of this measure, this finding needs to be treated as preliminary for the moment.

**Conclusions**

Explanations of violent conflict often see ethnic diversity as problematic because it can lead to mutual hatred and fear stemming from historic legacies, and may lead to security dilemmas and domination and control by majority-controlled states of minority groups and vice versa. The question our study was concerned with is: if the pessimistic theories of ethnic diversity and ethnic conflict are true, then do states respond first and foremost with militarization to address security considerations believing that higher militarization leads to greater security? Our results simply do not support this view. Militarization is actually lower under conditions of greater diversity measured by several different indicators.

Clearly, wider coverage of militarization variables beyond spending, the size of military forces and arms imports will provide more opportunities of testing the effects of ethnic and other diversity on states' response to real and perceived threats. Perhaps empirical studies in the future could include those expenditures classified as internal security expenditures on police and paramilitary forces, both public and private. Future research should also go beyond an aggregate measure of ethnic diversity and distinguish among ethnic minorities according to their degree of political activism and the extent to which grievances are expressed, their long-term political objective (equality of rights, autonomy, separatism and others) and the history of past violent clashes among ethnic groups in a country. One might be able to address some of these issues using data from the Minorities at Risk dataset, a task, which the current authors would like to take on in the future. Use of the dataset is not without problems, however, since the project only recognizes ethnic groups when some level of political conflict or repression exists. Since we are interested in how ethnic diversity relates to state militarization generally, not just in cases where

conflict or repression exists, we used general measures of ethnic diversity and polarization, as otherwise our results might suffer from selection bias.

Our analyses suggest clearly that ethnic diversity promotes lower militarization. Two potential explanations were discussed for this result. One draws from research predominantly undertaken by economists demonstrating how public goods provision is systematically lower in more diverse societies. We argued against this interpretation of our results, stating that while security is a public good, militarization might not provide it. Also, if militarization were a public good then we would observe a positive effect of democracy on militarization since democracy is known to be a strong determinant of public goods provision. However, our results suggest the opposite. We therefore favor the second explanation, which draws from the empirical literature on conflict onset and duration. This literature demonstrates that contrary to conventional wisdom, more diverse societies are not more prone to conflict and indeed perhaps are even more peaceful. If so and policy makers anticipate this, then they might see less need for militarization in diverse societies. The empirical conflict literature also suggests that ethnically and religiously polarized countries and those characterized by ethno-nationalist exclusion might face a higher risk of armed conflict. Interestingly, it is for the measures of polarization and ethno-nationalist exclusion that we fail to find the statistically significant negative effect on militarization. In conclusion, we believe that our results are consistent with and complementary to the empirical literature on conflict that suggests that fears about social diversity as security threats are largely unfounded.

Table 1. Correlation matrix of fractionalization and polarization measures.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1: Ethfrac (Fearon & Laitin) | 1.00 | | | | | | | | | |
| 2: Relfrac (Fearon & Laitin) | 0.39 | 1.00 | | | | | | | | |
| 3: Cultfrac (Fearon) | 0.82 | 0.33 | 1.00 | | | | | | | |
| 4: Ethfrac (Alesina et al.) | 0.76 | 0.31 | 0.74 | 1.00 | | | | | | |
| 5: Relfrac (Alesina et al.) | 0.31 | 0.89 | 0.20 | 0.23 | 1.00 | | | | | |
| 6: Linfrac (Alesina et al.) | 0.88 | 0.40 | 0.74 | 0.68 | 0.31 | 1.00 | | | | |
| 7: Ethlinfrac (Roeder) | 0.85 | 0.43 | 0.70 | 0.83 | 0.36 | 0.76 | 1.00 | | | |
| 8: Ethfrac (Montalvo & Reynal-Querol) | 0.84 | 0.36 | 0.68 | 0.81 | 0.29 | 0.73 | 0.86 | 1.00 | | |
| 9: Relfrac (Montalvo & Reynal-Querol) | 0.51 | 0.50 | 0.50 | 0.53 | 0.51 | 0.48 | 0.52 | 0.54 | 1.00 | |
| 10: Ethpol (Montalvo & Reynal-Querol) | 0.42 | 0.12 | 0.39 | 0.55 | 0.11 | 0.28 | 0.51 | 0.58 | 0.32 | 1.00 |
| 11: Relpol (Montalvo & Reynal-Querol) | 0.54 | 0.46 | 0.51 | 0.59 | 0.47 | 0.50 | 0.58 | 0.57 | 0.96 | 0.40 |

Table 2. Summary statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Military expenditures per GDP | 1589 | 2.90 | 2.82 | 0 | 29.00 |
| Military personnel per labor force | 1393 | 1.39 | 1.72 | 0 | 23.68 |
| Arms imports to total imports | 1406 | 2.85 | 5.32 | 0 | 36.86 |
| Ethfrac (Fearon & Laitin) | 1587 | 0.40 | 0.27 | 0 | 0.93 |
| Relfrac (Fearon & Laitin) | 1587 | 0.36 | 0.21 | 0 | 0.78 |
| Cultfrac (Fearon) | 1561 | 0.30 | 0.20 | 0 | 0.73 |
| Ethfrac (Alesina et al.) | 1589 | 0.44 | 0.25 | 0 | 0.93 |
| Relfrac (Alesina et al.) | 1589 | 0.42 | 0.23 | 0 | 0.86 |
| Linfrac (Alesina et al.) | 1560 | 0.39 | 0.28 | 0 | 0.92 |
| Ethlinfrac (Roeder) | 1589 | 0.46 | 0.27 | 0 | 0.98 |
| Ethfrac (Montalvo & Reynal-Querol) | 1307 | 0.44 | 0.28 | 0.01 | 0.96 |
| Relfrac (Montalvo & Reynal-Querol) | 1321 | 0.28 | 0.23 | 0.00 | 0.78 |
| Ethpol (Montalvo & Reynal-Querol) | 1307 | 0.51 | 0.24 | 0.02 | 0.98 |
| Relpol (Montalvo & Reynal-Querol) | 1321 | 0.46 | 0.34 | 0 | 1.00 |
| Ethexclusion (Cederman & Girardin) | 876 | 0.05 | 0.15 | 0 | 0.99 |
| GNI p.c. (ln) | 1589 | 8.34 | 1.15 | 5.94 | 10.49 |
| Economic growth | 1589 | 0.04 | 0.06 | -0.51 | 0.33 |
| Polity | 1589 | 2.92 | 6.97 | -10.00 | 10.00 |
| Government expenditures | 1589 | 16.24 | 6.64 | 2.98 | 56.51 |
| Population (ln) | 1589 | 16.30 | 1.46 | 12.87 | 20.97 |
| Contiguous military expenditures | 1589 | 2.97 | 2.28 | 0 | 24.46 |
| Contiguous military personnel | 1393 | 1.21 | 1.14 | 0 | 9.43 |
| Contiguous arms imports | 1406 | 2.85 | 5.32 | 0 | 36.86 |
| Peace years (civil war) | 1589 | 20.14 | 18.95 | 0 | 56.00 |
| Peace years (international conflict) | 1589 | 26.77 | 17.31 | 0.00 | 56.00 |
| Civil war | 1589 | 0.19 | 0.39 | 0.00 | 1.00 |
| International conflict | 1589 | 0.02 | 0.13 | 0.00 | 1.00 |

Table 3. Militarization and Fearon and Laitin's measures of fractionalization, 1988–2002

|  | (1) Military Expend. | (2) Military Expend. | (3) Military Pers. | (4) Military Pers. | (5) Arms Imports | (6) Arms Imports |
|---|---|---|---|---|---|---|
| Ethfrac (Fearon & Laitin) | -2.523*** | -2.545*** | -0.903** | -0.940** | -3.307** | -3.311** |
|  | (4.15) | (4.15) | (2.46) | (2.46) | (2.41) | (2.46) |
| Relfrac (Fearon & Laitin) | 0.877 | 0.880 | -0.541 | -0.559 | 0.611 | 0.647 |
|  | (1.20) | (1.21) | (1.31) | (1.34) | (0.40) | (0.43) |
| GNI p.c. (ln) | -0.328 | -0.338 | 0.050 | 0.035 | -0.690* | -0.647* |
|  | (1.39) | (1.43) | (0.46) | (0.31) | (1.93) | (1.86) |
| Economic growth | 1.293** | 1.281** | 0.093 | 0.064 | -0.208 | -0.097 |
|  | (2.08) | (2.09) | (0.14) | (0.10) | (0.08) | (0.04) |
| Polity | -0.040** | -0.039** | -0.012* | -0.012* | -0.105 | -0.112* |
|  | (2.28) | (2.25) | (1.89) | (1.79) | (1.62) | (1.72) |
| Government expenditures | 0.158*** | 0.157*** | 0.028** | 0.028** | 0.161** | 0.164*** |
|  | (4.52) | (4.56) | (2.17) | (2.15) | (2.52) | (2.69) |
| Population (ln) | -0.034 | -0.044 | -0.150** | -0.164** | 0.375 | 0.390 |
|  | (0.30) | (0.38) | (2.35) | (2.30) | (1.49) | (1.57) |
| Contiguous militarization | 0.130** | 0.126** | 0.568** | 0.557** | 0.110 | 0.118* |
|  | (2.52) | (2.48) | (2.23) | (2.17) | (1.55) | (1.72) |
| Peace years (civil war) | -0.020*** | -0.020*** | -0.004* | -0.004** | -0.024* | -0.024* |
|  | (3.74) | (3.74) | (1.81) | (2.02) | (1.84) | (1.89) |
| Peace years (intern. conflict) | 0.006 | 0.007 | -0.009 | -0.009 | -0.035** | -0.031** |
|  | (0.72) | (0.74) | (1.56) | (1.53) | (2.30) | (2.20) |
| Civil war | 0.639*** | 0.639*** | 0.055 | 0.053 | 2.375** | 2.391*** |
|  | (3.24) | (3.26) | (0.77) | (0.76) | (2.55) | (2.60) |
| International conflict | 0.763 | 0.761 | 0.608* | 0.612* | 3.232** | 3.160** |
|  | (1.24) | (1.25) | (1.79) | (1.80) | (2.19) | (2.18) |
| Observations | 1587 | 1587 | 1383 | 1383 | 1396 | 1396 |
| Countries | 131 | 131 | 138 | 138 | 139 | 139 |

Notes: Absolute t- and z-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 4. Militarization and Montalvo and Reynal-Queirol's measures of fractionalization, 1988–2002

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
|  | Military Expend. | Military Expend. | Military Pers. | Military Pers. | Arms Imports | Arms Imports |
| Ethfrac (Montalvo & R-Q.) | -1.580** | -1.688** | -0.771 | -0.777 | -2.985* | -2.979* |
|  | (2.02) | (2.03) | (1.22) | (1.21) | (1.68) | (1.68) |
| Relfrac (Montalvo & R-Q.) | 1.173 | 1.002 | 0.786 | 0.769 | 0.670 | 0.684 |
|  | (1.40) | (1.11) | (1.37) | (1.35) | (0.37) | (0.38) |
| GNI p.c. (ln) | 0.062 | -0.026 | 0.218* | 0.213* | -0.406 | -0.407 |
|  | (0.25) | (0.08) | (1.76) | (1.69) | (1.09) | (1.10) |
| Economic growth | 0.848 | 0.855 | -0.967 | -0.968 | -4.458 | -4.354 |
|  | (1.21) | (1.22) | (0.86) | (0.87) | (1.14) | (1.12) |
| Polity | -0.036** | -0.032* | -0.005 | -0.005 | -0.160** | -0.160** |
|  | (1.98) | (1.80) | (0.76) | (0.74) | (2.09) | (2.12) |
| Government expenditures | 0.135*** | 0.128*** | 0.016** | 0.016** | 0.208*** | 0.205*** |
|  | (5.01) | (4.84) | (2.01) | (2.00) | (2.60) | (2.58) |
| Population (ln) | -0.121 | -0.204 | -0.223** | -0.231** | 0.370 | 0.361 |
|  | (0.84) | (1.21) | (2.49) | (2.49) | (1.31) | (1.28) |
| Contiguous militarization | 0.104** | 0.090* | 0.579** | 0.574** | 0.115 | 0.113 |
|  | (1.99) | (1.80) | (2.13) | (2.12) | (1.37) | (1.35) |
| Peace years (civil war) | -0.023*** | -0.023*** | -0.006*** | -0.006*** | -0.039** | -0.039*** |
|  | (4.07) | (3.95) | (2.94) | (2.97) | (2.56) | (2.60) |
| Peace years (intern. conflict) | 0.010 | 0.011 | -0.007 | -0.007 | -0.036** | -0.036** |
|  | (1.19) | (1.36) | (1.23) | (1.21) | (2.33) | (2.36) |
| Civil war | 0.598*** | 0.603*** | 0.068 | 0.068 | 2.185** | 2.191** |
|  | (2.92) | (2.96) | (0.93) | (0.94) | (2.16) | (2.18) |
| International conflict | 0.254 | 0.233 | 0.300* | 0.298* | 1.886** | 1.903** |
|  | (0.87) | (0.81) | (1.76) | (1.76) | (2.16) | (2.21) |
| Observations | 1307 | 1307 | 1161 | 1161 | 1164 | 1164 |
| Countries | 102 | 102 | 109 | 109 | 109 | 109 |

Notes: Absolute t- and z-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 5. Militarization and Roeder's measure of fractionalization, 1988–2002

| | (1) Military Expend. | (2) Military Expend. | (3) Military Pers. | (4) Military Pers. | (5) Arms Imports | (6) Arms Imports |
|---|---|---|---|---|---|---|
| Ethlinfrac (Roeder) | -1.612** | -1.634** | -0.940** | -0.978** | -2.300* | -2.306* |
| | (2.20) | (2.21) | (2.05) | (2.05) | (1.71) | (1.78) |
| GNI p.c. (ln) | -0.241 | -0.252 | 0.086 | 0.074 | -0.541 | -0.509 |
| | (0.98) | (1.02) | (0.87) | (0.72) | (1.35) | (1.28) |
| Economic growth | 1.282** | 1.271** | 0.137 | 0.112 | -0.457 | -0.379 |
| | (2.07) | (2.07) | (0.22) | (0.18) | (0.19) | (0.16) |
| Polity | -0.038** | -0.037** | -0.012* | -0.011* | -0.097 | -0.102 |
| | (2.18) | (2.16) | (1.83) | (1.74) | (1.51) | (1.58) |
| Government expenditures | 0.158*** | 0.157*** | 0.025** | 0.025** | 0.150** | 0.153*** |
| | (4.51) | (4.55) | (2.06) | (2.03) | (2.46) | (2.61) |
| Population (ln) | -0.024 | -0.033 | -0.140** | -0.154** | 0.367 | 0.383 |
| | (0.21) | (0.29) | (2.18) | (2.13) | (1.52) | (1.61) |
| Contiguous militarization | 0.130** | 0.126** | 0.574** | 0.562** | 0.120 | 0.129* |
| | (2.54) | (2.50) | (2.22) | (2.15) | (1.63) | (1.81) |
| Peace years (civil war) | -0.020*** | -0.020*** | -0.004* | -0.004** | -0.022* | -0.022* |
| | (3.60) | (3.60) | (1.75) | (2.00) | (1.72) | (1.74) |
| Peace years (intern. conflict) | 0.007 | 0.007 | -0.009 | -0.009 | -0.034** | -0.030** |
| | (0.74) | (0.75) | (1.50) | (1.48) | (2.26) | (2.17) |
| Civil war | 0.642*** | 0.642*** | 0.062 | 0.060 | 2.389** | 2.403*** |
| | (3.24) | (3.27) | (0.88) | (0.87) | (2.57) | (2.62) |
| International conflict | 0.753 | 0.753 | 0.607* | 0.612* | 3.249** | 3.176** |
| | (1.23) | (1.24) | (1.76) | (1.77) | (2.17) | (2.16) |
| Observations | 1589 | 1589 | 1393 | 1393 | 1406 | 1406 |
| Countries | 132 | 132 | 139 | 139 | 140 | 140 |

Notes: Absolute t- and z-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 6. Militarization and Alesina et al.'s measures of fractionalization, 1988–2002

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Military Expend. | Military Expend. | Military Pers. | Military Pers. | Arms Imports | Arms Imports |
| Ethfrac (Alesina et al.) | 0.517 | 0.486 | 0.901 | 0.867 | 1.590 | 1.470 |
| | (0.51) | (0.48) | (1.12) | (1.06) | (1.01) | (0.95) |
| Relfrac (Alesina et al.) | -0.321 | -0.314 | -0.794* | -0.801* | -0.498 | -0.428 |
| | (0.47) | (0.46) | (1.88) | (1.89) | (0.34) | (0.30) |
| Linfrac (Alesina et al.) | -1.464* | -1.473* | -0.943 | -0.961 | -2.688* | -2.698** |
| | (1.77) | (1.78) | (1.53) | (1.57) | (1.96) | (1.99) |
| GNI p.c. (ln) | -0.187 | -0.203 | 0.155 | 0.140 | -0.437 | -0.414 |
| | (0.73) | (0.78) | (1.40) | (1.24) | (1.13) | (1.11) |
| Economic growth | 1.197* | 1.182* | 0.028 | 0.006 | 0.330 | 0.414 |
| | (1.83) | (1.83) | (0.04) | (0.01) | (0.14) | (0.18) |
| Polity | -0.037** | -0.037** | -0.012* | -0.011* | -0.108 | -0.115* |
| | (2.15) | (2.11) | (1.77) | (1.69) | (1.63) | (1.72) |
| Government expenditures | 0.159*** | 0.158*** | 0.025** | 0.025** | 0.154** | 0.157*** |
| | (4.50) | (4.54) | (2.11) | (2.08) | (2.49) | (2.65) |
| Population (ln) | -0.022 | -0.033 | -0.129** | -0.141** | 0.393 | 0.405* |
| | (0.19) | (0.28) | (2.08) | (2.05) | (1.63) | (1.70) |
| Contiguous militarization | 0.129** | 0.124** | 0.569** | 0.558** | 0.114 | 0.123* |
| | (2.49) | (2.44) | (2.24) | (2.17) | (1.51) | (1.69) |
| Peace years (civil war) | -0.018*** | -0.018*** | -0.003 | -0.004* | -0.016 | -0.016 |
| | (3.33) | (3.32) | (1.51) | (1.71) | (1.16) | (1.21) |
| Peace years (intern. conflict) | 0.006 | 0.006 | -0.009 | -0.009 | -0.039** | -0.035** |
| | (0.64) | (0.67) | (1.51) | (1.49) | (2.47) | (2.40) |
| Civil war | 0.629*** | 0.629*** | 0.034 | 0.032 | 2.482** | 2.501** |
| | (2.95) | (2.98) | (0.51) | (0.49) | (2.44) | (2.49) |
| International conflict | 0.797 | 0.794 | 0.629* | 0.632* | 3.284** | 3.208** |
| | (1.30) | (1.30) | (1.81) | (1.82) | (2.17) | (2.16) |
| Observations | 1560 | 1560 | 1360 | 1360 | 1373 | 1373 |
| Countries | 130 | 130 | 136 | 136 | 137 | 137 |

Notes: Absolute t- and z-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 7. Militarization and Fearon and Laitin's measures of ethnic fractionalization adjusted for cultural/linguistic distance.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Military Expend. | Military Expend. | Military Pers. | Military Pers. | Arms Imports | Arms Imports |
| Cultfrac (Fearon) | -1.447 | -1.488 | -0.906 | -0.939* | -1.703 | -1.731 |
| | (1.54) | (1.55) | (1.62) | (1.68) | (0.95) | (1.00) |
| Relfrac (Fearon & Laitin) | 0.473 | 0.469 | -0.620 | -0.651* | 0.012 | 0.046 |
| | (0.61) | (0.60) | (1.62) | (1.70) | (0.01) | (0.02) |
| GNI p.c. (ln) | -0.169 | -0.196 | 0.081 | 0.062 | -0.432 | -0.393 |
| | (0.67) | (0.77) | (0.70) | (0.54) | (1.10) | (1.00) |
| Economic growth | 1.394** | 1.369** | 0.097 | 0.066 | -0.311 | -0.211 |
| | (2.24) | (2.22) | (0.15) | (0.10) | (0.12) | (0.08) |
| Polity | -0.037** | -0.036** | -0.012* | -0.011* | -0.098 | -0.104* |
| | (2.16) | (2.08) | (1.81) | (1.70) | (1.55) | (1.65) |
| Government expenditures | 0.160*** | 0.158*** | 0.029** | 0.029** | 0.160** | 0.162*** |
| | (4.52) | (4.56) | (2.24) | (2.22) | (2.44) | (2.61) |
| Population (ln) | -0.064 | -0.086 | -0.166*** | -0.185** | 0.323 | 0.338 |
| | (0.54) | (0.70) | (2.62) | (2.55) | (1.35) | (1.44) |
| Contiguous militarization | 0.131** | 0.122** | 0.579** | 0.565** | 0.117 | 0.126* |
| | (2.55) | (2.44) | (2.29) | (2.21) | (1.56) | (1.73) |
| Peace years (civil war) | -0.019*** | -0.019*** | -0.004 | -0.004* | -0.021 | -0.020 |
| | (3.51) | (3.48) | (1.55) | (1.77) | (1.55) | (1.58) |
| Peace years (intern. confl.) | 0.006 | 0.006 | -0.011* | -0.011* | -0.035** | -0.031** |
| | (0.65) | (0.68) | (1.82) | (1.79) | (2.21) | (2.12) |
| Civil war | 0.676*** | 0.675*** | 0.066 | 0.064 | 2.472** | 2.487*** |
| | (3.35) | (3.37) | (0.90) | (0.89) | (2.55) | (2.59) |
| International conflict | 0.778 | 0.776 | 0.623* | 0.630* | 3.299** | 3.234** |
| | (1.24) | (1.25) | (1.80) | (1.81) | (2.17) | (2.16) |
| Observations | 1561 | 1561 | 1362 | 1362 | 1374 | 1374 |
| Countries | 129 | 129 | 136 | 136 | 137 | 137 |

Notes: Absolute t-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 8. Militarization and Montalvo and Reynal-Queirol's measures of ethnic and religious polarization.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Military Expend. | Military Expend. | Military Pers. | Military Pers. | Arms Imports | Arms Imports |
| Ethpol (Montalvo & R-Q.) | 0.112 | 0.081 | 0.179 | 0.175 | -1.600 | -1.581 |
| | (0.11) | (0.08) | (0.26) | (0.26) | (0.82) | (0.81) |
| Relpol (Montalvo & R-Q.) | 0.331 | 0.071 | 0.074 | 0.053 | 0.099 | 0.114 |
| | (0.52) | (0.10) | (0.21) | (0.16) | (0.08) | (0.09) |
| GNI p.c. (ln) | 0.183 | 0.062 | 0.252** | 0.244** | -0.095 | -0.097 |
| | (0.76) | (0.20) | (2.17) | (2.10) | (0.26) | (0.26) |
| Economic growth | 0.825 | 0.833 | -0.976 | -0.976 | -4.506 | -4.381 |
| | (1.19) | (1.19) | (0.88) | (0.88) | (1.15) | (1.13) |
| Polity | -0.035* | -0.031* | -0.005 | -0.005 | -0.157** | -0.157** |
| | (1.91) | (1.74) | (0.76) | (0.74) | (2.08) | (2.11) |
| Government expenditures | 0.134*** | 0.128*** | 0.016** | 0.016** | 0.204*** | 0.200** |
| | (4.98) | (4.81) | (1.99) | (1.99) | (2.59) | (2.56) |
| Population (ln) | -0.153 | -0.251 | -0.236*** | -0.246*** | 0.274 | 0.264 |
| | (1.08) | (1.46) | (3.07) | (3.06) | (1.05) | (1.01) |
| Contiguous militarization | 0.103** | 0.089* | 0.579** | 0.574** | 0.120 | 0.116 |
| | (1.97) | (1.77) | (2.15) | (2.14) | (1.38) | (1.34) |
| Peace years (civil war) | -0.023*** | -0.022*** | -0.006*** | -0.006*** | -0.042** | -0.041** |
| | (3.86) | (3.82) | (2.85) | (2.91) | (2.35) | (2.40) |
| Peace years (intern. confl.) | 0.010 | 0.012 | -0.007 | -0.007 | -0.035** | -0.035** |
| | (1.20) | (1.38) | (1.21) | (1.19) | (2.24) | (2.28) |
| Civil war | 0.597*** | 0.602*** | 0.067 | 0.067 | 2.178** | 2.187** |
| | (2.90) | (2.95) | (0.90) | (0.92) | (2.18) | (2.21) |
| International conflict | 0.253 | 0.231 | 0.298* | 0.296* | 1.865** | 1.887** |
| | (0.86) | (0.81) | (1.74) | (1.74) | (2.10) | (2.16) |
| Observations | 1307 | 1307 | 1161 | 1161 | 1164 | 1164 |
| Countries | 102 | 102 | 109 | 109 | 109 | 109 |

Notes: Absolute t-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

Table 9. Militarization and Cederman and Girardin's measure of ethno-nationalist exclusion, 1988–2002

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Military Expend. | Military Expend. | Military Pers. | Military Pers. | Arms Imports | Arms Imports |
| Ethexclusion (Cederman & Girardin) | 2.310 | 1.180 | 1.275 | 1.121 | -4.870 | -4.606 |
| | (1.10) | (0.52) | (0.91) | (0.81) | (1.08) | (1.01) |
| GNI p.c. (ln) | 0.139 | 0.275 | 0.208 | 0.221 | -0.618 | -0.719 |
| | (0.53) | (0.74) | (1.28) | (1.29) | (0.84) | (0.97) |
| Economic growth | 1.983** | 1.887*** | 0.126 | 0.041 | -1.738 | -1.754 |
| | (2.57) | (2.59) | (0.12) | (0.04) | (0.49) | (0.50) |
| Polity | -0.001 | 0.012 | -0.033** | -0.032** | 0.035 | 0.053 |
| | (0.03) | (0.53) | (2.14) | (2.13) | (0.34) | (0.53) |
| Government expenditures | 0.177*** | 0.175*** | 0.008 | 0.007 | 0.037 | 0.039 |
| | (5.01) | (5.27) | (0.50) | (0.45) | (0.66) | (0.70) |
| Population (ln) | -0.303 | -0.952** | -0.245** | -0.305*** | 0.123 | 0.086 |
| | (1.33) | (2.17) | (2.57) | (2.71) | (0.50) | (0.37) |
| Contiguous militarization | 0.100* | 0.078 | 0.547* | 0.531* | 0.397** | 0.387** |
| | (1.75) | (1.44) | (1.94) | (1.88) | (2.17) | (2.07) |
| Peace years (civil war) | -0.023* | -0.026* | 0.000 | -0.002 | 0.005 | 0.007 |
| | (1.81) | (1.77) | (0.06) | (0.42) | (0.23) | (0.32) |
| Peace years (intern. conflict) | 0.014 | 0.014 | -0.008 | -0.009 | -0.026 | -0.026 |
| | (1.56) | (1.52) | (1.06) | (1.07) | (1.48) | (1.49) |
| Civil war | 0.149 | 0.128 | -0.079 | -0.096 | 0.542 | 0.572 |
| | (0.66) | (0.59) | (0.82) | (1.06) | (0.69) | (0.74) |
| International conflict | -0.027 | 0.013 | 0.336 | 0.346 | 1.684* | 1.694* |
| | (0.09) | (0.05) | (1.43) | (1.46) | (1.69) | (1.74) |
| Observations | 876 | 876 | 671 | 671 | 678 | 678 |
| Countries | 69 | 69 | 70 | 70 | 70 | 70 |

Notes: Absolute t- and z-statistics in brackets. Constant and year-specific time-dummies included, but coefficients not reported. *, **, *** significant at .1, .05 and .01 level, respectively.

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