Does ethnic diversity increase violent crime? A global analysis of homicide rates, 1995-2013

Indra de Soysa & Carmen Noel

ABSTRACT

Many scholars argue that diverse preferences and coordination failure stemming from high ethnic diversity results in high social frictions, leading to socio-political failure. Criminological theories suggest that crime is driven by very similar processes. The specialized literature on civil war, however, reports a diversity dividend, arguing that when two large groups (polarization) make up a society, the risk of armed violence is increased. Using data on global homicide rates from 1995-2013 for over 140 countries, we find that ethnic heterogeneity associates with homicide rates in an inverted-U shape relationship. Measures of ethnic polarization confirm these results directly. The results suggests that ethnic polarization and ethnic dominance rather than diversity are what matter for personal security measured as homicide rates. The conditional effect of high diversity and income inequality associates with lower homicide rates, results that reject the view that societal heterogeneity and income inequality drive social dislocation. Several possible intervening variables, such as unemployment among males and youth, ethnic exclusion and discrimination, good governance and institutional quality, as well as several demographic and political variables do not effect the basic results. It seems that the heavy emphasis placed on ethnic diversity for explaining social dislocation and violence, in so far as it relates to a country´s homicide rate, seems to be misplaced.

1. Introduction

Conflict is thought to be pervasive in ethnically divided societies (Horowitz, 2000). Several scholars of development and governance blame high social diversity, particularly ethnic diversity, for the failure of development in many poor countries (Alesina, Easterly, & Matuszeski, 2011; Alesina & La Ferrara, 2005).[i] The issue has even gained salience in Western societies where immigration has spurred discussions on social stability (Putnam, 2007). In much of the specialized literature, however, the question of ethnic divisions and societal disarray is highly contested (Cederman & Girardin, 2007; Fearon & Laitin, 2003). A few recent studies find, however, report that higher ethnic diversity increases violent crime (Altheimer, 2007; Cole & Gramajo, 2009). We revisit this issue with the most updated data, the most comprehensive geographical and temporal coverage than all previous studies, and we employ several appropriate statistical techniques for panel data. Like others, we believe that the homicide rate of a country is a very valid measure of the "everyday nature" of physical security and socio-political stability than large-scale armed violence (Rivera, 2016; Stretesky, Long, & Lynch, 2016). The issue is not just academic but is highly relevant for current debates about building decent multicultural societies and policy aimed at enhancing the prospects of socio-economic development around the world. Is high diversity due to so called "artificial borders" a problem for social stability and everyday physical security?

Using newly-available data on homicide rates covering a large set of countries (142) over the 1995-2013 period and several measures of ethnic diversity and polarization, we find that ethnic fractionalization relates to the homicide rate in an inverted-U shape, results similar to studies on civil war that

argue that polarization matters more than does fractionalization (Esteban & Ray, 2008). A direct measure of polarization and a measure of the size of the second-largest ethnic group confirm the curvilinear effect of fractionalization, which supports the view that relative homogeneity is more problematic than diversity per se. Interestingly, the effect of ethnic diversity is conditioned negatively on the homicide rate the higher the income inequality. We also tested several possible intervening variables that are theoretically linked to homicide rates that could have explained why ethnic polarization matters. There is little support for grievance-based explanations for homicide as theorized by structural theories, and quite surprisingly ethnic discrimination lowers the homicide rate. There is strong evidence to suggest that good governance and strong institutions, rather than political freedoms alone, lower the homicide rate. Our results taken together do not warrant the recent pessimism linking ethnic heterogeneity to high social frictions, in so far as homicide rates capture aspects of socio-political failure.

2. Theory

Sociological and criminological theories of crime stress the role of deviance, social stress, relative deprivation, and group discrimination for explaining the prevalence of serious crime (Durkheim, 1933; Merton, 1968; Palma, 1995). Most studies in criminology, perhaps correctly, directly focus at the individual level, looking at personality traits, neighborhood factors, socioeconomic situations to explain why some people engage in crime while others do not. A few studies in criminology have addressed the question of how ethnic configuration within a country might explain criminality more broadly, but explicit theory about how ethnic diversity increases crime does not exist (Altheimer, 2007; Cole & Gramajo,

2009). Altheimer (2007: 2-3) provides two broad views based on social disorganization theory and theory linking economic inequality to crime. Social disorganization theory posits the view that groups from different cultural backgrounds find themselves in competing value systems. Competing value systems coupled with low economic development and low social mobility lead to the decay of social institutions of control, resulting in turn in crime and agression. Social heterogeneity theory argues that although groups will not automatically be hostile towards each other, high income inequality will lead to social frustration and frictions between groups. Instead of their aggression being directed at the state and institutions that discriminate against them, as Marxists would expect, these groups will direct their hostility against other groups, who they may blame for their woes. For these structural theorists, ethnic diversity generates violence only when it is accompanied by income inequalities (Altheimer, 2007). Before examining specifics about how ethnic diversity affects murder rates, we examine two broad competing theoretical world views about the political effects of ethnic diversity. Indeed, recent theoretical advances in economics blame high social frictions in ethnically diverse societies for development failure because diverse societies will lack the necessary cooperation and coordination required for developing sound endogenous institutions underpinning economic growth. Crime rates in terms of violent crime should capture high social frictions better than rarer ethnic conflicts.

2.1 The Diversity Deficit

The idea of ethnic conflict is embedded in the view that the more ethnic, linguistic, and religious groups a country contains, the harder it is to generate the necessary

social cohesion and consensus to govern stably. Easterly et al. (2006, p. 105) succinctly elucidate the connection between ethnic fractionalization and low social cohesion thus:

> Socially cohesive societies ... have fewer potential/or actual leverage points for groups, individuals, or events to expose and exacerbate social fault lines ....

Scholars pessimistic about the chances for endogenous institutional change argue that most poor countries lack the preconditions for the emergence of good governance, largely because these countries have artificial borders where ethnic diversity act as hindrances to sound political and economic governance due to the many social frictions arising from diverse preferences and coordination failure. As Easterly (2006, p. 113) writes,

> In many ethnically divided countries today, politicians often exploit ethnic animosities to build a coalition that seeks to redistribute income to *us* from *them.*

Thus, social frictions arise from simple ethnic discrimination and the real and perceived exploitation of minorities regardless of the type of government in place. He goes on to write (Easterly 2006, p. 113),

> Different ethnic groups may have conflicting interests in public services: group A may want a road in their region when group B may want a road in *their* region; the more segregated ethnic groups are; the less likely group B voters are to use or care about the road in group A's region. This may cause voters to choose a lower level of public services overall.

Political corruption is also attributed to ethnic diversity. According to Easterly (2006, p. 114), 'corrupt politics merge with ethnic politics as parties compete to win resources for their own ethnic groups.' High diversity also apparently inhibits

trust, and low trust societies supposedly suffer corrupt government due to collective action problems (Bardhan, 2005; Putnam, 1993). In summary, ethno-linguistic diversity accounts for governance failure because of distributional conflicts, coordination failure, diverse preferences, lack of secure property rights and economic liberties, poor taxation and public goods provision, and political corruption. If ethnic diversity produces these outcomes, then we should be able to observe the effects of diversity on social breakdown measured in terms of increased violent crime in a society.

2.2 The Diversity Dividend

Contrary to pessimists on social diversity, some argue a diversity dividend. The British politician, Lord Acton, saw minorities playing a crucial role in the advance of liberty because they acted as a check against abusive majorities (Kukathas, 2003). He contrasted liberal Britain with other European powers of his time and attributed Britain´s success in trade, business, finance, and governance to its liberal policies and tolerance of diversity. He is credited with the now famous aphorism, "power corrupts, but absolute power corrupts absolutely." These ideas were also present among the founding fathers of the United States, whose rallying cry against tyranny was to embrace diversity exemplified by the motto of the United States—*e pluribus unum*—or "from the many, one."

Indeed, several scholars argue that, rather than diversity, ethnic polarization, where a country is dominated by a fairly large majority, is more dangerous because of the problem of permanent minority status for large segments of one minority group, or even a small group of minorities (Esteban & Ray, 2008). Polarization of ethnic groups is highest when two large groups face

eachother, where politics is likely to be zero-sum in nature. Others, relying on new institutional economics, argue that ethnic and other ties are likely to advance economic activity so that greater diversity might spur development since within group ties lower transaction costs where institutions are weak (Collier, 2001). On the question civil war, he too argues that greater diversity might be safer than dominance by one ethnic group. As Collier (2001: 129) writes,

> ...both theoretically and empirically fractionalization actually makes societies safer, while dominance increases the risk of conflict. A policy implication is that fractionalized societies are viable and secession should be discouraged.

Political scientists too argue that a multiple of cross-cutting cleavages due to cultural and other divisions have a stabilizing effect on democracy because cross-cutting cleavages might moderate extreme nationalism (Houle, 2015; Arend Lijphart, 1977). Why cultural differences measured by ethno-linguistic fractionalization alone matter and why it might supersede all other ties are critical questions that are theoretically and empirically still quite ambiguous (Selway, 2011).

It may also be that rather than diversity, ethnic polarization due to relative homogeneity leads to conditions of ethnic nepotism, where large groups compete for position because of the fear of being permanently marginalized and due to mutual fear (Esteban & Ray, 2008). If this is the case, then preserving greater diversity is better for societies. Finally, several sub-national studies suggest that high social diversity increases public goods, even if studies discussed above suggest the opposite (Gisselquist, Leiderer, & Nino-Zarazua, 2016). Research on Indian states suggest that in many states, subnational identitites have been built that encourage common bonds between groups, leading to better welfare for all

(Singh, 2015). At least one recent study reports that high diversity encourages more economic freedom (AUTHORS). Clearly, the issue of whether or not social diversity is conflict-producing is still largely contested.

Some scholars have challenged the view that ethnic heterogeneity that makes ethnicity an issue, identifying instead the conditions under which ethnic groups clash. They identify ethnic exclusion from state power and ethnic discrimination, which could occur under any demographic configuration of ethnic groups, as the underlying mechanism for violence (Cederman, Wimmer, & Min, 2010). For these theorists, demographic configuration is immaterial to the grievance-causing conditions that exist, suggesting that conflict erupts when an ethnic group is aggrieved due to discrimination and exclusion. Indeed, as one scholar of crime has written

> In cross-national literature on homicide, the problem of discrimination is usually dealt with indirectly by looking at the degree of population heterogeneity ... and assuming that minority groups suffer unequal treatment based on these qualities...it would be better to avoid the assumption and examine the impact of discrimination on homicide directly (Beeghley, 2003: 135-136).

We test these mechanisms directly in models examining ethnic heterogeneity´s effect on homicide rates. First, however, we explore several theoretically-interesting ways in which ethnic heterogeneity may lead to higher homicide rates.

2.3 Social Diversity & Homicide

Sociological/criminological focus on structural factors relate quite intimately to arguments about ethnic heterogeneity and development failure. Two theories prominent in the literature can be compared with how economists view the

problem of heterogeneity and social cohesion—social disorganization theory and conflict theory. Social disorganization theory proposes that a lack of social cohesion and solidarity lead to atomization of society, anomie and violence. Deviance flourishes in societies with low solidarity (Akers & Sellers, 2016). According to supporters of the social disorganization theory ethnic heterogeneity prevents the acceptance of a dominant norm, which are arguments close to how economists view diverse preferences and coordination failure. High diversity can affect trust and differing ethnic and cultural groupings will have low affinity for each other (Rothstein, 2011). They argue that social disorganization weakens social bonds and shared values, leading to the lack of communication between different groups for solving collective dilemmas. Heterogeneity undermines intra-groups cultural connection (Chon, 2012, p. 733).

Using social disorganization theories, most studies focus on economic factors, such as income inequality and other identity-promoting factors that divide people as part of a complex that explains crime, but are in turn often blamed on underlying societal heterogeneity. Economic and social divisions thus are tied up to reduce legitimacy of states and legal systems, where some groups or individuals will come to view state institutions as illegitimate (Nivette & Eisner, 2013). These arguments link closely with the explanations of development economists about how ethnic and other diversity reduces the prospects of development because of coordination failure and social frictions.

Rather than diversity, many argue that what matters is polarization, where two or more relatively large groups mobilize, and where bargaining is more likely to breakdown in serious disputes. Rather than cross-cutting cleavages that force consensus and prevents mobilization around one identity, relative homogeneity

leads to segmented cleavages, which many see as more problematic for governance (Arendt Lijphart, 2004). Where fairly large groups are segmented along group lines, therefore, cooperation is likely to be limited and us versus them dynamics are likely to be more prevalent (Esteban & Ray, 2008). Can it be that rather than diversity, what matters is ethnic polarization due to relative homogeneity?

Indeed several studies in criminology and sociology report a positive effect of higher diversity on homicides (Altheimer, 2007; Cole & Gramajo, 2009). The existing studies on ethnic diversity and homicide unfortunately do not take into account the arguments in the specialized literature about appropriate measurement of ethnic heterogeneity, nor the possibility of polarization rather than diversity being the culprit. Moreover, these studies are hampered by small sample size, or the use of a single point in time, and many relevant omitted variables (Altheimer, 2007; Cole & Gramajo, 2009; Hansmann & Quigly, 1982). Importantly, none of the previous studies control for country size, or existing armed conflict, when estimating the effect of heterogeneity on the homicide rate. Since large countries are likely also to have more heterogenous populations and because countries where the state has lost the monopoly on the use of force are likely to experience the break down of law and order, previous studies may suffer from omitted variables bias. We follow other recent studies that have tried to bridge the study of civil war with that of crime and violence, which some suggest are in fact theoretically highly linked (Collier & Hoeffler, 2004; Rivera, 2016). We hypothesize the following:

H1. Higher ethnic fractionalization increases the homicide rate

H2. Ethnic polarization increases the homicide rate

H3. Ethnic fractionalization and polarization increase homicide rates conditional on income inequality

3. Data and Methods

3.1 Dependent variable & estimation strategy

The homicide rate is a valid indicator of the level of violent crime in a society because homicides are far less likely to be underreported relative to other forms of crime (Fajnzylber, Lederman, & Loayza, 2002; Rivera, 2016). The measurement and gathering of homicide data is not straightforward, however. We rely on the World Bank´s *World Development Indicators* (WDI), which has consistently reported homicide rates (World Bank, 2016). According to the WDI,

"The intentional killing of a human being by another is the ultimate crime. Its indisputable physical consequences manifested in the form of a dead body also make it the most categorical and calculable. … Criminal justice data were collected through UNODC regular collections of crime data from Member States, through publicly available data produced by national government sources and from data compiled by other international and regional agencies, including from Interpol, Eurostat, the Organization of American States and UNICEF. Public health data on homicides were mainly derived from databases on deaths by cause disseminated by the World Health Organization (WHO). The inclusion of recent data was given a higher priority in the selection process than the length of the time series (number of years covered). *An analysis of official reports and research literature is regularly carried out to verify homicide data used by government agencies and the scientific community. As a result of the data collection and validation process, in many countries several homicide datasets have become available from different or multiple sources. Therefore, data series have been selected to provide the most appropriate reference counts*" (our italics).

However, it should be noted that the WDI also notes that:

The degree to which different societies apportion the level of culpability to acts resulting in death is also subject to variation. Consequently, the comparison between countries and regions of "intentional homicide", or unlawful death purposefully inflicted on a person by another person, is also a comparison of the extent to which different countries deem that a killing be classified as such, as well as the capacity of their legal systems to record it. Caution should therefore be applied when evaluating and comparing homicide data.

Despite the uncertainties associated with gathering homicide data, we feel that the World Bank´s effort to collect data and verify using a variety of sources makes the WDI data the most realiable data available currently. Indeed, we obtain a correlation of r = 0.996 between the WDI data and data obtained directly from the *Homicide Monitor* maintained by the Igarapé Institute in Rio de Janeiro, Brasil. Recently, many criminological experts, such as Manuel Eisner, rely on this data (Eisner, 2015). Before getting deeper into the methods and data section, we first examine our dependent variable in some detail.

***** FIGURE 1 ABOUT HERE*****

As seen in figure 1, the global rate of homicide has been steadily reducing since the Mid-1990s, a pattern consistent with that of the United States (Gramlich, 2017; Levitt & Dubner, 2006). Eastern Europe has seen the steepest declines, and Western countries in general enjoy the lowest rates of homicide, which are also in decline in recent years.

Figure 2 also suggests declines in the homicide rate in other regions across the globe, the steepest decline being in Sub Saharan Africa, a region which has now reached a significantly lower level than Latin America. Latin America shows a gradual increase in recent years. North Africa and the Middle East as well as Asia lie below the global average. Despite what seems like uniform declines in homicide across the globe, there is considerable variation between the countries within the regions (Weiss, Santos, Testa, & Kumar, 2016). While these trends, thus, might disprove simple notions about societal disarray due to increasing societal

heterogeneity, more sophisticated modelling is required to isolate the effect of ethnic diversity on homicide.

<center>*****FIGURE 2 ABOUT HERE*****</center>

We analyze a sample of roughly 142 countries with populations over half a million inhabitants and covers the period 1995 to 2013. The sample is considerably larger than most other comparable studies, which have at most 60 countries in their sample (Nivette, 2011; Nivette & Eisner, 2013). Many previous studies on the topic have not used more than a handful of years. This paper uses Ordinary Least Squares (OLS) regression analysis on time-series, cross-sectional (TSCS) dataset. The main problems with pooled data are potential bias due to serial correlation and heteroscedasticity. Therefore, we compute Newey-West standard errors, which are robust to first order serial autocorrelation and heteroscedasticity (Newey & West, 1987). Initially, we conducted the Wooldridge test for autocorrelation, which suggested that our data do exhibit first-order serial correlation (Drukker, 2003). We include time fixed effects in all our tests to capture any unique events due to data collections and definitions that may have changed as well as to prevent spurious effects from trending data. Due to the time-invariant nature of the heterogeneity measures, we cannot estimate fixed effects. We estimate the following regression equation:

$$\text{(Log)Homicide rate}_{it} = b_0 + \text{Frac}_{it} + Z_{it} + e_{it}$$

In robustness tests, we also test our basic models using the Driscoll-Kraay standard errors, which take into account cross-sectional correlation, or spatial dependence (Driscoll & Kraay, 1998; Hoechle, 2007).

3.2 Independent Variable(s)

3.2.1 Ethno-linguistic Fractionalization

Measuring social heterogeneity is not unproblematic (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003; Fearon, 2003). We rely on Alesina et al´s measure of ethnic fractionalization as our primary measure of fractionalization for the simple reason that he and his co-authors have generally been the most pessimistic about the effects of fractionalization on societal outcome. This measure captures the probability that two randomly drawn individuals in a country are from different ethnolinguistic groups. The ethnic fractionalization index will increase with the number of ethnolinguistic groups and will increase the more equal the size of the groups. It should be noted that we prefer to use fractionalization measures using all groups rather than just politically-relevant groups as some others have done because politically-relevant groups underestimates the extent of fractionalization and is plagued by selection bias (Marquardt & Herrera, 2015). Alesina et al.´s ethnic fractionalization correlates at r = 0.90 with Fearon´s measure of ethnic fractionalization.

Alesina et al. (2003) base their definition of ethnicity on both racial and linguistic characteristics. For instance, ethnicity, they argue, in some of the European and Sub-Saharan African countries is largely based on languages. While the definition of ethnicity for Latin American countries involve a combination of racial and linguistic characteristics. In order to construct an alternative measure,

they collected disaggregated data on 650 ethnic groups for 190 countries from multiple sources, such as the Encyclopedia Britannica, which was the source of the data in 124 of 190 countries along with data from the CIA's World Fact Book and several other sources. If two or more sources for the index of ethnic fractionalization were identical to the third decimal point, then Alesina et al. (2003) used these sources. If their sources diverged resulting in variance in the index of fractionalization to the second decimal point, then they used the source where the reported ethnic groups constituted the greatest share of the total population. The formula used for constructing the fractionalization index is:

$$Frac_j = 1 - \sum_{i=1}^{N} S^2_{ij} \qquad (2)$$

Where, S_{ij} is the share of group i ($i = 1……N$) in country j. Note that a higher value represents greater fractionalization and vice-versa.

To measure ethnic polarization, we primarily use Fearon and Laitin´s (2003) data that measure the size of the second-largest group. If the size of the largest minority approaches 0.5, or half of the population, then a country is essentially inhabited by two large groups. Indeed, if one squares the ethnic fractionalization measure, one essentially comes close to capturing this dimension of polarization (Schneider & Wiesehomeier, 2008). Thus, we test both a linear term and a quadratic term of ethnic fractionalization to model polarization effects. Additionally, we test a measure of polarization introduced by economists, which correspond well with Fearon´s size of the second-largest group (Esteban & Ray, 2008; Montalvo & Reynal-Querol, 2005). The correlation between Fearon´s size of

the second-largest group variable and Reynal-Querol´s polarization measure is r = 0.77, which suggests that they capture slightly varying aspects of polarization.

3.2.2 Control Variables

We keep our models simple and avoid the "kitchen sink" approach in order to aid interpretation of the basic results (Achen, 2005). One important control when testing the effects of ethnic and other diversity is total population size. Large countries are more likely to contain more ethnolinguistic and other groups than smaller populations. Large countries might be harder to govern. Previous studies fail to control for country size (Altheimer, 2007; Cole & Gramajo, 2009). We use the log of total population taken from the World Development Indicators (WDI) online dataset (World Bank, 2017).

Most studies include per capita income to capture the level of development, which is a catch-all variable for the strength of state institutions, quality of public services, security infrastructure, and the opportunity costs of individuals for engaging in anti-social behavior (Collier, 2000; Fearon & Laitin, 2003). We use the log of per capita income measured in terms of 2011 current international dollars (WDI). Following others, we include regime type in the model to account for political structure (LaFree & Tseloni, 2006; Nivette, 2011). We use the Polity IV dataset, which accounts for both autocratic and democratic features of a country (Gurr & Jaggers, 1995). Therefore, we add two dummy variables capturing both features, using anocracies (inconsistent polities) as the reference category. Thus, an autocracy takes the value 1 if the polity scale is between -10 and -6 (0 if not), while a democracy takes the value 1 if the polity scale is above +6 (0 if not). Finally, we observe whether or not a country is suffering civil war with at least 25 battle-

related deaths in a single year, where ongoing civil war takes the value 1 (0 if not) as well as the years of peace since the last conflict starting in the year 1946, which is a count variable (Gleditsch, Wallensteen, Eriksson, Sollenberg, & Strand, 2002).[ii]

To test whether ethnic heterogeneity and polarization are conditioned by income inequality, we enter interactive effects using the GINI index supplied by the WDI data. Since this data is mostly recorded in quintiles, we interpolate the values inbetween the five-year periods. Moreover, we test several possible intervening variables between ethnic fractionalization and polarization, such as grievance causing group discrimination and exclusion discussed in the conflict literature (Cederman et al., 2010). We also test poor economic performance by testing unemployment rates as total male unemployment as a share of the total labor force as well as the share of youth unemployment. The male population is defined as persons between the ages of 15 and 65. The youth population is males between the ages of 15 and 25. These data are taken from the WDI.

Finally, we test the effect of institutional quality in order to see if the effects of heterogeneity on the homicide rate works through fair and legitimate state institutions. Those economists that see social heterogeneity underpinning economic failure, often point to the failure of governance under heterogeneous conditions (Easterly, 2006). We utilize the widely used International Country Risk Guide (ICRG) data as our measures of good governance and institutional quality (Kaufmann, Kraay, & Zoido-Lobaton, 1999).[iii] The ICRG data rely on newspaper reports, expert judgements, and country expert calibration of the level of control of corruption and bureaucratic quality to measure good governance. If social heterogeneity is the underlying cause of social failure as many claim, we should be able to observe these effects directly through these variables. These measures

are also fairly good proxies for how "legitimate" a state´s institutions are in the eyes of the population. All variables and summary statistics are presented in the appendix.

4. Results

Table 1, column 1 presents results using the linear term of ethnic diversity.

*****TABLE 1 ABOUT HERE*****

As seen in there, ethnic fractionalization has a positive and significant effect on the homicide rate, holding constant all the control variables. Substantively, holding all other variables at their mean values, a standard deviation increase in ethnic fractionalization increases the homicide rate by 21% of a standard deviation of the homicide rate. In real terms, this amounts to roughly 3 extra homicides per 100,000 people.[iv] Relative to a similar increase in income per capita, holding all other variables at their means, decreases the homicide rate by roughly 5 deaths per 100,000 people. Arguably, the effect, though positive, is relatively small.

The results of the control variables are not surprising when it comes to the level of income, but strong democracies show a positive effect as do strong autocracies. These results support others that find similar results on democracy using completely different crime and homicide data as well as alternative measures of democracy (LaFree & Tseloni, 2006). Why strong democracies increase homicides after income is controlled may suggest that poor democracies lack administrative capacity, or among the poor countries, democracies potentially have marginally better reporting, compared with anocracies

(Rosendorff & Vreeland, 2006). However, given that the World Bank has taken great care to crosscheck national reporting against specialized agencies, such as the WHO, OECD, UNOCD and other agencies as well as verified with experts, and because homicides are generally harder to hide, we suspect that the results capture substantive effects. Notice that strong autocracies also show a positive association with homicides, which puts into question the "underreporting argument." We leave this for future studies to examine more closely.

In column 2, we add Fearon´s measure of the size of the second-largest group. As seen there, the effect of having a large minority, or ethnic polarization, has a strong positive effect that is statistically highly significant. A standard deviation increase in the size of the second-largest group increases the homicide rate by 4 deaths per 100,000 people. This means that as a society approaches greater homogeneity, or becomes more polarized, homicides increase. In column 3, we directly test Reynal-Querol´s measure of ethnic polarization measured according the the Esteban and Ray formula. As seen there, polarization increases the homicide rate. A standard deviation increase in polarization increases the homicide rate by a little over 5 deaths per 100,000 inhabitants. Thus, relative homogeneity has a substantively much larger impact than diversity. To push this reasoning further, we enter the quadratic term (squared term) of ethnic fractionalization in column 4. Indeed, the results show that ethnic fractionalization increases the homicide rate and then decreases at higher levels of fractionalization in an inverted-U shape relationship. These results are further indication that ethnic polaraization and not fractionalization is what explains the homicide rate. This effect can be seen graphically in Figure 3. Ethnic

fractionalization initially increases homicides and then decreases it rapidly at roughly 0.5 (or exactly the middle) of the index.

***** FIGURE 3 ABOUT HERE*****

In Table 2, we test the conditional effects of ethnic fractionalization and polarization with income inequality, following Altheimer (2007) and others that argue that diversity and social dislocation due to inequlity would have the largest consequences in terms of crime and violence.

*****TABLE 2 ABOUT HERE*****

As seen in column 1, contrary to expectation, the conditional effect of higher fractionalization and high inequality lowers the homicide rate, results that are statistically highly significant ($p<0.001$). Interpretation of the conditional effects is best done visually in a marginal effects plot, where we plot the effect of ethnic heterogeneity against the different values of inequality, assessing the level of significance at the 95% confidence interval.

*****FIGURE 4 ABOUT HERE*****

As seen there, increasing inequality conditions the effect of heterogeneity negatively at a decreasing rate, results that are statisitically significant. Notice that income inequality and ethnic fractionalization both have independent effects that are positive and statistically highly significant. Following Neumayer (2005), when

we drop the time-invariant fractionalzation measure and run a fixed effects estimation, the statistically significant effect of the gini variable becomes negative and statistically highly significant.[v] In columns 2 and 3, however, the conditional effects of the size of the second largest group and the GINI and polarization and the GINI are both statistically not different from zero. The conditional effects, thus, do not suggest that income inequality makes the effect of polarization on homicides any worse than polarization´s independent effect, which is statistically always significant.

Tables 3 and 4 present results of potential intervening variables in the basic models containing the fractionalization measures, or the polarization effect.

*****TABLE 3 ABOUT HERE*****

As seen in column 1, the share of the excluded population from political power has no statistically significant effect on the homicide rate. Surprisingly, in column 2, the share of the discriminated population shows a negative and statistically highly significant effect. In other words, the greater the politically discriminated size of the population, the lower the homicide rate, a result that generally does not support the view that people would become more aggrresive against each other when they face discrimination. Substantively, a standard deviation increase in the share of the population that is politically discriminated reduces homicides by 2 deaths per 100,000 people. In columns 3 and 4 we enter our unemployment measures. Only total unemployment has a statistically significant effect, but surprisingly youth unemployment level is not statistically significant. Substantively, a standard deviation increase in the total unemployment rate

21

increases homicides by a little less than 1 death per 100,000 people, which is negligible.

In Table 4, we estimate our governance and demographic variables.

*****TABLE 4 ABOUT HERE*****

As seen in column 1, final government consumption as a share of GDP has a statistically significant, negative effect on the homicide rate. However, this result does not alter the basic results on the ethnic diversity variables, suggesting that the effect of diversity does not work through government consumption. A standard deviation increase in government consumption reduces homicides by less than 2 murders per 100,000 inhabitants. In column 2, the control of corruption also has a statistically highly significant negative effect on the homicide rate. This result too does not affect ethnic fractionalization´s effect on homicide. Substantively, a standard deviation increase in control of corruption reduces the homicide rate by almost 5 deaths per 100,000 population, more than twice the impact of government consumption. This is a fairly large effect, but there is some reason to believe that the homicide rate might influence the construction of governance measures, such as the control of corruption. In any case, the fact that it does not affect the results of the ethnic fractionalization measures is telling. In column 3, bureaucratic quality too has a statistically significant negative effect. Substantively, a standard deviation increase in this variable reduces the homicide rate by a little over 7 deaths per 100,000 people, which is a very large effect given that a standard deviation of the homicide rate is only 14.5 deaths per 100,000 people.

Columns 4 & 5 display the results of two additional variables capturing demographic factors that potentially affect the results of ethnic heterogeneity. Again, the results on the ethnic variables do not change. The share of the population living in urban areas independently increases the homicide rate. Substantively, a standard deviation increase in the urban population increases the murder rate by 2.9 deaths. A similar increase in quantity of population density, however, reduces the homicide rate by 2 deaths. The negative result of population density and population size suggest that people may not necessarily kill each other because of neo-malthusians claims about scarcity, or the effect of population size and density on state capacity, an issue that requires closer scrutiny in future work. For our purposes, however, ethnic heterogeneity´s inverted-U shape relationship with homicide holds despite the presence of several theoretically-relevant intervening variables. The relationship between ethnic group configuration and social disarray seems to support the polarization position to a far greater extent than pessimists about the social, political and economic consequences of ethnic heterogeneity.

We run several tests of robustness on our basic findings using Alesina et al´s measure of ethnic heterogeneity. Recall that it yields results almost exactly to that of Fearon and Laitin´s measure. First, we ran the basic model without logging the homicide rate. The inverted-U shape for the unlogged dependent variable is even more pronounced (not shown). Secondly, we enter the economic growth rate, which has no effect on the homicide rate and does not alter the basic result on heterogeneity. Next, we enter regional dummies in our basic model with the quadratic equation. We leave out "Western" countries as the reference category. The addition of regional dummies has little effect on the inverted-U shape

relationship between ethnic heterogeneity and the homicide rate. Interestingly, all regions, with Latin America and Sub Saharan Africa showing the highest impacts, have statistically significant positive effects compared with the West, except that the effect of North Africa and the Middle East is not significantly different from zero. This result suggests that culture might not matter more than circumstance since people from the North African and Middle East regions are often blamed for violent crime, at least in terms of the immigration debate in Western Europe (Marshall, 1997).

Next, we test whether the homicide rate might be affected by the foreign born population measured as the international migrant stock as a share of the total population (World Bank, 2017). Since these data are reported in quintiles, we interpolate the values within the 5 year periods between 1995 and 2013. Do the ethnic heterogeneity measures capture the demographic impact of fairly recent immigration? The effect of the migrant stock is negative and statistically highly significant. A standard deviation increase in the international migrant stock as a share of the population reduces the homicide rate by 3.6 murders per 100,000 population.

Next, we dropped all the control variables and ran only the linear and quadratic terms of the ethnic heterogeneity variable. The results still showed a curvilinear, inverted-U relationship between heterogeneity and homicides. We then dropped the ethnic heterogeneity variables and used only the size of the second largest group in all tests reported above. The results remain essentially the same, suggesting that rather than diversity/fractionalization, it is relative homogeneity, or conditions of polarization that matter. Given the uncertainties surrounding the dependent variable, namely the question of data reliability

stemming from the different definitions of homicide that reporting countries might use, we winnowed out the data to test just the industrialized democracies, which are likely to use a very similar deifinition of intentional killing and be the most reliable in terms of reporting. Thus, we create a sample of only the so-called WENAO countries consisting of Western Europe, North America, and Oceania, including Japan, which makes up a group of 23 industrialized countries. Using this sample, our basic result of an inverted U-shape relationship between ethnic fractionalization and homicides uphold.

We tested our basic model for multicollinearity using the VIF test but found none of our controls to be collinear. We also checked for influence points by computing the cooksd statistic. Re-running the basic model without roughly 100 data points with cooksd values above the cutoff of 4/n made little difference to the basic results reported. Finally, we use an estimating method that takes into consideration potential spatial correlation, or cross-sectional dependence that might bias results in panel data analysis (Driscoll & Kraay, 1998; Hoechle, 2007). All our results are robust to potential cross-sectional dependence. Our results, thus, are robust to alternative measures of heterogeneity, sample size, alternative specifications, a sample of only industrialized countries, and estimation methods.

5. Conclusion

There is a contentious debate about the effects of ethnic diversity on social outcomes, such as peace and prosperity. Recent scholarship in economics identifies ethnic and other societal diversity as the underlying cause of economic and social failure due to high social frictions that undermine sound institutional

development (Alesina et al., 2011; Alesina & La Ferrara, 2005). Indeed, theories in political economy place diverse preferences, coordination failure, and distributional struggles among ethnic groups at the center of explanations of poor development outcomes (Bardhan, 1997). The recent wave of immigration and problems related to terrorism have also led some to raise concerns about increasing cultural heterogeneity because of immigration and social cohesion in the Western world (Putnam, 2007). Such fears have led to the rise of populistic politicians in Europe and North America, who raise fears among people about the vagaries of immigration, particularly linking immigration with crime (Wodak, 2015). The pessimistic arguments about ethnic and other heterogeneity are being made when the specialized literature on conflict seems to suggest that ethnic heterogeneity makes countries safer, whereas relative homogeneity reflected in ethnic polarization might be problematic. Following others that have used homicide rates to test other propositions about what causes the risk of civil war, we examined the issue of social heterogeneity and violent crime (homicide). The everyday nature of homicide is arguably a valid measure of the degree of social trust and cooperation among peoples and communities (Rivera, 2016).

Keeping in mind the limitations of the homicide data, which may be affected by issues pertaining to comparability, our results, using a variety of measures, suggest that ethnic heterogeneity and ethnolinguistic diversity relate to the homicide rate in an inverted-U pattern, where high diversity reduces the homicide rate while the highest impact on homicide is roughly when a country has two large groups. These results support the polarization and ethnic dominance arguments supported in empirical analyses of civil war (Collier & Hoeffler, 2004; Esteban & Ray, 2008). Two alternative measures of polarization measured as the

26

size of the second largest group as well as a direct measure polarization calculated on the basis of Esteban and Ray´s (2008) reasoning both show positive effects on the homicide rate. The results fail to support the view that high fractionalization generates the social frictions that prevent favorable social, political and economic outcomes in so far as violent crime measures socio-political failure. If a country´s homicide rate is a reflection of the legitimacy of state institutions and effectiveness of the provision of public safety and security, then a more diverse society seems to be beneficial—indeed, support for a diversity dividend. Moreover, ethnic diversity is conditioned by income inequality measured by the GINI index negatively on homicide rates, a result clearly at odds with several dominant explanations of crime in criminology and sociology, such as social dislocation and group conflict theory in so far as the GINI captures the relevant dimensions of societal cleavages.

The results taken together also raise several questions about structural / critical theories explaining crime and violence as a reaction against injustice in terms of discrimination, and that such reactions are endemic in illegitimate political orders. For example, high levels of democracy are robustly related to higher homicide rates, results supported in other studies using different measures of democracy and violent crime (LaFree & Tseloni, 2006). The rapid democratization in Latin America has not seemed to dampen the high homicide rates there. Like others, we too find that income inequality´s effect is not robust to fixed effects estimation that accounts for country heterogeneity, but that absolute wealth in terms of per capita income and good institutions in terms of good governance are what reduce interpersonal violence (Neumayer, 2005). Indeed, a direct measure of the share of the discriminated population has a negative effect

on the homicide rate, suggesting that horizontal inequalities among groups might not matter for predicting homicides, a conclusion we make only tentatively as this issue is not central to our investigation. Importantly, measures that gauge change in the size of ethnic groups over time, such as how demographic transitions and differential growth rates among ethnic groups matter might be usefully examined in future studies.

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ENDNOTES

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[i] We focus primarily on ethno-linguistic diversity because the extant literature focuses on this dimension of social diversity rather than other sources of diversity, such as religions and occupations, or even class. We use the term ethnic fractionalization and heterogeneity, as well as diversity, interchangeably. Many scholars assume that high

ethnic diversity and the lack of social cohesion are synonymous. See, for example, Easterly et al. (2006).

[ii] Civil War data is the "conflict incidence" variable in the Uppsala Conflict Data Project´s civil war data. Peace years are calculated using the BTSCS command in STATA, which simply counts the years of peace since the last failure. See http://www.pcr.uu.se/research/ucdp/datasets/ (last accessed 14 August, 2016).

[iii] The ICRG researcher datasets are available commercially through: https://www.prsgroup.com/about-us/our-two-methodologies/icrg (accessed 14th August, 2016)

[iv] We compute substantive effects by multiplying the beta coefficient of X by the standard deviation of X and then dividing the product by the standard deviation of (log)Y. We then use this percentage to calculate the actual homicide rate using the value of the unlogged Y variable.

[v] These results are not shown, but available upon request. However, due to interpolation of the data and the fact that our time dimension is fairly short, we do not place too much faith in these results and leave it to future studies to examine more closely.