Moralizing Gods and Armed Conflict

Ahmed Skali*

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Abstract

This study documents a robust empirical pattern between moralizing gods, which prescribe fixed laws of morality, and conflict prevalence and fatalities, using spatially referenced data for Africa on contemporary conflicts and ancestral belief systems of individual ethnic groups prior to European contact. Moralizing gods are found to significantly increase conflict prevalence and casualties at the local level. The identification strategy draws on the evolutionary psychology roots of moralizing gods as a solution to the collective action problem in pre-modern societies. A one standard deviation increase in the likelihood of emergence of a moralizing god increases casualties by 18 to 36% and conflict prevalence by 4 to 8% approximately.

JEL Classification: D74, O55, Z12

Keywords: Conflict; Commitment Problem; Religion; Africa; Cooperation

1 Introduction

Religion has been the subject of scholarly attention in a wide range of disciplines, including recent work in economics, psychology, biology,[1] and many other fields of inquiry. Religion has also been frequently linked to violent conflicts; a wealth of anecdotal evidence suggests that very few things galvanize a willingness to fight contests in a kill-or-be-killed fashion like religious beliefs do. Still, there has so far been little empirical evidence robustly linking religion to violence, and causality has remained elusive. This is an important shortcoming in the existing literature, considering the devastating impacts of armed conflict, which entails enormous human and economic costs and locks many developing countries in poverty and conflict traps (Collier *et al.*, 2003).

*School of Economics, Finance and Marketing, Royal Melbourne Institute of Technology. Thoughts and comments from editor Lionel Page, two anonymous referees, Paul Raschky, Jakob Madsen, Erik Hornung, Trent MacDonald, Stephanie Rizio, Benno Torgler, Alberto Posso, Julien Brailly, and conference and seminar participants at Monash University, the University of Melbourne, the Royal Melbourne Institute of Technology, the 2016 Economics and Biology of Contests Conference at Queensland University of Technology, 2016 Public Choice Society Meetings, 2015 Australasian Public Choice Conference and 2015 Australasian Development Economics Workshop are gratefully acknowledged.

[1] For recent contributions in economics, see for example Akçomak, Webbink and ter Weel (2015), Michalopoulos, Naghavi and Prarolo (2016), Arruñada (2010), Becker and Woessmann (2009), Botticini and Eckstein (2007), and Augenblick, Cunha, Dal Bó and Rao (2012). Recent work in psychology includes Norenzayan (2013), Shariff (2015), Norenzayan and Shariff (2008), Bourrat, Atkinson and Dunbar (2011), McNamara, Norenzayan and Henrich (2016); while contributions in biology include Roes and Raymond (2003), Roes (2009), Peoples and Marlowe (2012), and Johnson (2005).

Combining anthropological data on the religious beliefs of African ethnicities, prior to European contact, with data for all conflict events in Africa over the 1989 - 2013 period, this study documents the novel, robust empirical pattern that the share of the population, at the local level, whose ethnic ancestors believed in a god with moral rules, is positively associated with conflict prevalence and fatalities. To rule out the possibility that this relationship is driven by a third factor that impinges on both belief formation in pre-modern societies and contemporary conflicts, the identification strategy in this paper relies on an Instrumental Variables (IV) approach. The endogenous regressor, which is the likelihood of emergence of moralizing gods at the local level, is instrumented with ancestral settlement size and the distance to the point of origin of the nearest moralizing god.

The first instrument, ancestral settlement size, is motivated by recent research in evolutionary psychology. In his book *Big Gods*, Norenzayan (2013) provides a detailed account of how moralizing gods help mitigate the collective action problem formulated in Olson's (1965) early seminal work. The logic behind the instrument is as follows: small settlements, which function as tight-knit communities, can successfully enforce cooperative norms of behavior without the need for a moralizing god. An agent who deviates from the cooperative norm pays a hefty reputational penalty, because the small community size means her transgression is likely to become common knowledge. Ethnic groups with small settlements can therefore maintain reputation-based, evolutionarily stable cooperation norms, because would-be transgressors face a credible threat of exclusion from future socio-economic interactions, thereby threatening their survival chances. As the size of the representative settlement grows, the reputation mechanism no longer functions as a commitment device. The newfound anonymity affords agents a chance to deviate from cooperative norms and bear little expected cost, which results in large-scale free-riding. Moralizing gods can solve the free-riding problem by providing incentives, in the form of costly supernatural punishment, to do the "right" thing even when no human is watching. This finding is well-documented in Norenzayan (2013) and Norenzayan and Shariff (2008). In Section 3.3, the Hadza, an ethnic group present in Tanzania, are discussed as a salient example of cooperation without gods in small societies.

The second instrument used in this paper is the distance to the point of origin of the nearest moralizing god. This instrument is motivated by the idea that the likelihood of adoption of neighboring belief systems increases with geographic proximity. As such, geographic proximity to a society with a moralizing god provides a source of exogenous variation in the likelihood of emergence of a moralizing god. This idea is supported by Watts *et al.*'s (2015) finding that the Austronesian expansion, which began around 5000 B.C., helped diffuse moralizing gods through cultural exchanges between societies. Cultural exchanges are, in turn, more likely to occur between neighboring societies. An important assumption behind this instrument is that the locations of the point-of-origin is orthogonal to the characteristics of the local area. In this study, this condition is likely to be met, as previous research (Botero *et al.*, 2014; Michalopoulos, 2012) has shown that the emergence of moralizing gods and ethnic groups, respectively, are well-explained by local geographic factors. The distance instrument used herein is closely related to others employed in recent contributions in the economics literature. Akçomak, Webbink and ter Weel (2015) study the effect of the Brethren of the Common Life (BCL), a religious community that emphasized literacy, on city growth and human capital accumulation in the 14^{th} century Netherlands, instrumenting the presence of the BCL with the distance to its city of origin, Deventer. The earlier seminal contribution of Becker and Woessman (2009) uses the distance to Wittenberg, the point of origin of the Protestant Reformation, as an instrument for the spread of Protestantism, and shows that human capital accumulation, rather than the Protestant work ethic as famously asserted by Weber (1930), may be behind the relative prosperity of Protestant regions. Some other salient uses of distance-based instrumental variables are discussed in more detail in Section 3.3.

The principal appeal of using these two instruments jointly, beyond facilitating testing of overidentifying restrictions, is that each instrument speaks to one of the most compelling reasons why we would expect moralizing gods to emerge, namely the need for a coordination device that mitigates free-riding, and the concentric diffusion of ideas. Empirically, the instruments perform very well: in addition to being strongly correlated with the endogenous regressor and econometrically valid, the first-stage regressions capture over 80% of the cross-sectional variation in the likelihood of emergence of moralizing gods. This provides some reassurance that the instruments are successful at capturing the bulk of the historical processes leading up to the emergence of moralizing gods.

This study contributes to the literature in the following ways. First, it tests of one of the leading rational theories used to understand behavior in contests in the armed conflict literature: the commitment problem, which emerges where one or more agents cannot credibly commit to peace: peace contracts become unenforceable and conflict ensues (Blattman and Miguel 2010; Fearon 1995). Although Blattman and Miguel (2010) describe it as one of the most crucial areas of research for conflict scholars, the commitment problem has, to the best of my knowledge, not been tested empirically so far.[2] This lack of empirical testing in the existing literature is potentially due to the absence of a suitable naturally occurring setting. In this paper, religion is used as an impediment to credible commitment. The central idea to this test is that societies with a tradition of a moralizing god are less likely to compromise away from their beliefs, no matter how small the deviation (Sinnott-Armstrong, 2013). Because morality-based beliefs are often not debatable, religion provides an ideal testing ground for the commitment problem theory.

Second, in studying the relationship between religion and violence, this paper relates to the emerging body of empirical evidence on the religion and conflict nexus. In a recent contribution, Basedau, Pfeiffer and Vüllers (2016) show that religious considerations are a robust predictor of conflict onset. Isaacs (2016) studies religious rhetoric by political actors, and finds that, although violent rhetoric correlates with violence, the relationship is potentially endogenous, as previously violent actors are more likely to use violent religious rhetoric. Svensson (2007) finds that conflicts are significantly less likely to be terminated by a formal negotiation process when one of the conflict actors makes a religious claim.

Third, this study addresses another critical issue in the conflict literature: the necessity for research on the causes of armed conflict at the sub-national level (Blattman and Miguel 2010, p. 8, term sub-national-level work the "most promising avenue for new empirical research"). This study contributes to a limited, recent literature which studies conflict at the sub-national level across many countries (including Michalopoulos and Papaioannou 2016; Besley and Reynal-Querol 2014; Hodler and Raschky 2014; Almer, Laurent-Lucchetti and Oechslin 2014; and Harari and La Ferrara 2013). The course taken by the literature follows recent research examining sub-national level evidence for single countries (see for example Dube and Vargas 2013; Urdal 2008; Bohara, Mitchell and Nepal 2006) and from the earlier, large cross-country literature. Throughout this article, the empirical work is conducted at the grid-cell level, where each cell extends over 100 km by 100 km. Grid-cells can be thought of as virtual countries, which are arbitrary units of observation drawn deterministically by Geographic Information Systems (GIS) software. Crucially, all empirical specifications in this paper include country fixed effects, which are able to control for country-specific conflict correlates, including state capacity, colonial history, geography, and many other factors. As such, this paper takes a step towards more disaggregated research.

Fourth, this paper also contributes to the recent literature in economics on the long shadows of historical institutions, which has produced many results that shed light on our understanding of how

[2] Key theoretical contributions include, for example, Dal Bó and Powell (2009), Powell (2006), Schwarz and Sonin (2008), Garfinkel and Skaperdas (2000), and Baliga and Sjöström (2004).

deeply rooted, stark differences in contemporary cross-country development came to arise.[3] The use of instrumental variables in this paper improves upon the empirical approach used in most papers in this literature. While the body of knowledge about the long shadows of history has grown enormously in recent years, implementing appropriate quasi-experimental methods in historical context has proven difficult. With the notable exceptions of Nunn (2008) and Nunn and Wantchekon (2011), who devise identification strategies relying on external instruments, many studies regress a contemporary outcome variable Y on a key right-hand side regressor X that is determined in the distant past. This approach has been hugely beneficial in learning about the consequences of historical factors, since the determination of X in the distant past means reverse causality concerns are unlikely. Nevertheless, the presence of confounding biases remains a potential concern. Although their results are remarkably robust, Michalopoulos and Papaioannou (2013, p. 148) discuss this point explicitly, and acknowledge the lack of exogenous variation in the data. In this paper, because we cannot rule out that the emergence of moralizing gods and violence in the modern era are both driven by some unobserved variable, ordinary least squares (OLS) estimates of the effect of ancestral religions on modern conflict may be biased and inconsistent, justifying the use of an IV approach. In studying the mechanism through which an ancestral social norm is formed, this paper also follows on BenYishay, Grosjean and Vecci (2015), who explain the emergence of matrilineal inheritance with the prevalence of fishing as a primary activity, which can itself be traced back to reef density.

The remainder of this paper is organized as follows. Section 2 provides some background, including contrasting arguments as to the effect of religion on conflict. In Section 3, the empirical approach and data are presented. Section 4 discusses the empirical results and Section 5 offers some concluding remarks.

2 Religion and Conflict: Contrasting Arguments

2.1 Moralizing Gods and Violence

As noted in the introduction, human history is replete with examples of violent conflict with some level of religious overtones. Even followers of religions that are associated with relatively peaceful behavior, at least in the popular perception, can sometimes turn ruthlessly violent. For example, in Burma and Sri Lanka, Buddhist monks have attacked Muslim civilians. Strathern (2013) describes this as the result of the "overriding moral superiority of (one's) worldview."

In the field of psychology, Bushman *et al.* (2007) test this notion of overriding moral superiority, in an experimental study of religious adherence and aggression. Participants were asked to read a violent passage said to come from either the Bible or an ancient non-religious scroll. Then, participants competed on a task where the winner received the option to engage in aggression, by playing a loud noise in the loser's headphones. Participants who self-identified as believers were significantly more likely to exercise the aggressive option, and especially more likely to do so when primed to believe that the violent passage was from the Bible. Bushman *et al.* (2007) conclude that violence that is sanctioned by moralizing gods

[3]Recent research has documented, for example, that modern-day fertility and attitudes to gender roles have been shaped by centuries-old division of labor (Alesina, Giuliano and Nunn, 2011, 2013), that more democratic contemporary institutions are well-explained by the traditional political accountability of local chiefs (Gennaioli and Rainer, 2007), that a history of political centralization is associated with better development outcomes (Michalopoulos and Papaioannou, 2013), that the origins of modern distrust and underdevelopment in Africa can be traced back to the slave trade that began in the 16th century (Nunn, 2008; Nunn and Wantchekon, 2011), that early democratic features predict long-term economic success (Madsen, Raschky and Skali, 2015), that pre-colonial conflicts in Africa have left a legacy of conflict (Besley and Reynal-Querol, 2014) and, more generally, that culture matters for economic growth (Gorodnichenko and Roland, 2011).

significantly increases aggression.

In economics, a similar notion termed "limited morality" can be found in Tabellini (2008) and Gorodnichenko and Roland (2011). Limited morality refers to one's willingness to set aside any moral objections when dealing with out-groups. Gorodnichenko and Roland (2011, p. 1) describe limited morality as follows: "Limited morality (...) views given norms of morality valid only within a given group such as the extended family, the clan or the tribe. When interacting with people outside one's extended family, these social norms do not apply and opportunistic and amoral behavior is considered morally acceptable and justified." Thus, limited morality also helps explain why the presence of moral rules dictated by a moralizing god can result in violence, even if violence can, notionally, be prohibited in some parts of the religious scriptures.

Another key issue highlighted in Atran and Ginges (2012, p. 855) is the role of moralizing gods in triggering "intractable conflicts." Sinnott-Armstrong (2013) discusses how belief systems with moralizing gods can make compromise impossible. Suppose a tree on Eve's property is struck by lightning and threatens to collapse on Adam's neighboring house. Adam first asks Eve to cut the tree down, but she refuses, because she enjoys sitting in the shade from the tree. Adam then offers to cut the tree himself and replace it at his own cost, to which Eve agrees. However, one of Eve's three brothers objects to this compromise, fearing that the young tree would not provide enough shade. Adam convinces him to accept this compromise, pointing out that if the tree were to fall on Adam's house, Eve's family would be legally liable for all repair costs. Another of Eve's brothers is not swayed by Adam's argument, but is eventually convinced as Adam reminds him of their past friendship. Sinnott-Armstrong's (2013) contention is that, as long as no element of sacredness enters the problem, a compromise can be reached. To illustrate this point, we turn to the role of Eve's third brother, who rejects all forms of compromise. Although he is aware of legal liabilities and of their cordial relationships as neighbors, he thought God was declaring the tree sacred when he struck it with lightning. No earthly consequence, no matter how grave, would ever be sufficient to accept having the tree removed and incur the wrath of God; therefore, no compromise is possible. Cooperation has effectively broken down, no bargaining solution can be reached, and conflict is likely to ensue.

In political science, Hassner (2003) identifies the role of unwillingness to compromise on sacred issues as a critical aspect of many conflicts. For example, Hassner ascribes the failure of the 2000 Camp David peace talks between Palestine and Israel to an inability to agree on a compromise for a religious site that is sacred to both Judaism and Islam. In ancient Greece, four wars were fought over the shrine of Apollo. In Independence, Missouri, two churches that broke away from the Church of Jesus Christ of Latter Day Saints fought an acrimonious legal battle over an empty lot. This lot was deemed by the Mormon doctrine to be the site of a sacred temple to be built upon Christ's second coming. In India, the Babri mosque in Ayodhya was destroyed in 1992 by militant Hindu nationalists, triggering some of the most deadly riots in India's history. The mosque's demolition was seen as retribution for the alleged destruction of a Hindu temple by a Muslim ruler approximately 400 years prior, on the site of the Babri mosque (Hassner 2003, pp. 16-18).

2.2 Moralizing Gods and Cooperation

On the other hand, and despite the abundance of anecdotal evidence linking religion and violence, religious issues are behind only a small fraction of all conflicts (Philips and Axelrod, 2007). The argument that moralizing gods can be expected to decrease violence is simple, yet very compelling. It is well-known in the social sciences that, in order to elicit cooperative behavior, the likelihood of free riding must be

reduced (Olson, 1965). A moralizing god, with the ability to punish transgressions and deviations from cooperative behavior even if no human is watching, is therefore an extremely powerful commitment device (Norenzayan 2013, Norenzayan and Shariff 2008). Because moralizing gods can function as commitment devices and enhance cooperation, it would be reasonable to expect moralizing gods to be negatively correlated with violence.

Support for this notion has also been found in the recent economics literature. In particular, Michalopoulos, Naghavi and Prarolo (2016) illustrate this argument by documenting a robust pattern for the adoption of Islam. As a set of rules that provides binding agreements, Islam, with its moralizing god, has been adopted more heavily in desert areas, where the need for such a commitment device is comparatively greater.

3 Empirical Approach and Data

3.1 The Grid-Cell as the Unit of Observation

The empirical analysis in this paper is conducted at the grid-cell level. GIS software is used to draw a set of parallel horizontal lines and a set of parallel vertical lines; the distance between two parallel lines is 0.9 degrees, which is approximately 100 km at the equator. The gridding process therefore draws cells of about 100 km by 100 km, as shown in Figure 1. Geo-referenced data for ethnic groups and conflict, as described below, are then matched by location to a unique grid-cell.

Figure 1: Conflict Events on the Songhai Ethnic Homeland.
Source: Author's calculations based on UCDP/GED and Nunn and Wantchekon (2011)

Grid-cells can be thought of as virtual countries, with boundaries that are drawn arbitrarily. Using grid-cells as the unit of analysis means we have repeated observations for each country and are therefore able to control for country-specific characteristics, which would not be feasible in cross-country regressions (Michalopoulos, 2012). This is an important consideration because, from the previous literature, we know that many causes and correlates of conflict are country-specific. A key country characteristic that is expected to impinge on conflict is the rule of law: holding all else equal, states with stronger national institutions are likely to witness fewer deaths from conflicts than weak or failed states. Controlling for

state capacity will be adequately accomplished by including country dummies. Another likely important factor is colonial history, as Michalopoulos and Papaioannou (2016) show that improper border design by colonial powers affects conflict all the way to the present. These factors, along with culture, geography, and all other country-specific conflict predictors, will be adequately accounted for by the country dummies.

3.2 Main Variables

Ancestral Beliefs

Table 1 presents summary statistics for all variables used in this paper. The data on ancestral religions is constructed from the pioneering work of anthropologist George Peter Murdock (1959, 1967). In two major ethnographic projects, Murdock provides a spatial mapping of 834 ethnicities in Africa through the *Human Relations Area Files* (Murdock, 1959), and detailed socio-cultural characteristics of these ethnicities in the *Ethnographic Atlas* (Murdock, 1967). The original *Atlas* was published in 29 installments in the *Ethnology* journal between 1962 and 1967 and subsequently revisited by J. Patrick Gray for the *World Cultures Journal* in 1986. The data in the *Atlas* reflect the body of knowledge collected by explorers and anthropologists in numerous field studies. Because Murdock (1967) explicitly set out to capture the characteristics of ethnic groups prior to contact with Europeans and colonization, these data are taken to reflect the historical patterns that unfolded in long time horizons leading up to colonization. For Africa, these data provide unique insights into the ancestral characteristics of indigenous societies.

In particular, the Murdock (1967) data contain detailed information about the degree of religiosity for 224 ancestral ethnicities. The original "High Gods" variable in Murdock (1967) is coded as follows: 0 means a god is absent or "not reported in substantial descriptions of religious beliefs"; 1 means a high god is present but not concerned with human affairs; 2 means a god is involved in human affairs but not supportive of human morality; and 3 denotes a god that is both involved in human affairs and supportive of human morality (Murdock, 1967, p. 17). This last type of god is what the evolutionary biology literature refers to as *moralizing* (Roes and Raymond 2003; Roes 2009, 2014; Laurin, Shariff, Henrich and Kay 2012; Peoples and Marlowe 2012; Johnson 2005). Because moralizing gods prescribe fixed positions with respect to certain issues, religious adherents can be unwilling to deviate from the prescribed position, no matter how small the deviation (Sinnott-Armstrong, 2013). Among other studies, Roes (2009), Roes and Raymond (2003) and Johnson (2005) all use the "High Gods" variable from Murdock (1967) or its equivalent in the smaller Standard Cross Cultural Sample (Murdock and White, 1969), another well-known ethnographic database, as their measure of religious beliefs. Based on this variable, I construct *Moralizing God* at the grid-cell level as the share of the population in each grid-cell whose ethnic ancestors had moralizing god traditions. Details on the construction and sources for all variables employed in this paper are available in the appendix.

Location of Ethnic Homelands and Validation

In order to locate the ethnic homeland of each society in the *Ethnographic Atlas*, I use Nunn and Wantchekon's (2011) digitized map of the *Human Relations Area Files* project (Murdock, 1959; Figure 2). Nunn and Wantchekon's map is a GIS shapefile where each ethnic group is assigned to a unique polygon. Lending validity to the analysis, Nunn and Wantchekon (2011) document a strong correlation between the current place of residence of Afrobarometer survey respondents and the spatial location of their ethnicity's traditional ethnic homeland.

Figure 2: Ancestral Ethnic Homelands.
Source: Nunn and Wantchekon (2011)

Although the boundaries of ethnic groups in Murdock (1967) are likely to have been drawn with some degree of imprecision, the correlation between conflict events and ethnic homelands is visible in the data. Figure 1 shows the homeland of the Songhai ethnic group in Mali: despite the likely mapping errors, it is apparent that conflict events cluster along a thin strip of the Songhai's ancestral homeland.

Conflict Data

The conflict data are from version 4 of the Uppsala Conflict Data Project Georeferenced Event Dataset (UCDP/GED: Sundberg and Melander 2013; Croicu and Sundberg 2015). UCDP/GED, the longest existing geo-referenced time-series conflict dataset, is a comprehensive dataset of all occurrences of armed conflict across all African countries between 1989 and 2013. GED monitors and reports all occurrences of civil conflict, and assigns each event by geographic coordinates to a point location on a GIS shapefile. Figure 3 displays the raw data for conflict locations in the GED dataset. GED also provides information on the number of fatalities, the participants, and several other variables. Based on the point coordinates given in UCDP/GED, each conflict event is assigned to a 100 km x 100 km grid-cell.

Using the entire observation window of the UCDP/GED dataset (1989-2013), two outcome variables are defined at the grid-cell level. First, $ln(Fatalities)$, which measures conflict deadliness, is the natural logarithm of the total number of deaths from conflict in each grid-cell. Second, $s(Conflict)$, which measures conflict prevalence, is the share of conflict years to total years. A year is coded as a conflict year if the death toll from conflict exceeds 25, following the convention in the literature (Blattman and Miguel 2010, p. 3). Where $s(Conflict)$ is the dependent variable, only grid-cells with a population density over 10 people per square kilometer are considered, as very scarcely inhabited areas are unlikely to be informative.

3.3 Identification Strategy

Consider the following empirical model:

Figure 3: Conflict Locations.
Source: UCDP/GED

Table 1: Summary Statistics.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Fatalities	919	1781.98	17,455.81	1	360,400
s(Conflict)	919	0.09	0.19	0	1
Moralizing God	919	0.37	0.48	0	1
Ancestral Settlement Size	919	0.24	0.10	0	1
Moral Dist	919	459.03	487.56	6.21	2448.81
Agricultural Suitability	919	0.32	0.26	0	1
Disease Suitability	919	0.33	0.29	0	1
Ruggedness	919	0.17	0.20	0	1
Extended Family	919	0.45	0.47	0	1
Early Intensive Agriculture	919	0.39	0.48	0	1
Early Political Centralization	919	0.29	0.43	0	1
% Christian	884	0.22	0.32	0	1
% Muslim	884	0.08	0.23	0	1

Notes. Each observation corresponds to a 100 km $*$ 100 km grid-cell. *Moral Dist* is measured in km. *Moralizing God*, *Ancestral Settlement Size*, *Extended Family*, *Early Intensive Agriculture* and *Early Political Centralization* represent the share of the population in each grid-cell whose ethnic ancestors displayed the relevant characteristic. *Agricultural Suitability*, *Disease Suitability* and *Ruggedness* are normalized between 0 and 1.

$$Conflict_g = \alpha_c + \beta_1 Moralizing\ God_g + \beta_2 PD_g + \beta_3 Pop_g + \mathbf{X}_g\delta + \varepsilon_g \quad (1)$$

where *Conflict* is either conflict deadliness (*ln(Fatalities)*) or conflict prevalence (*s(Conflict)*), d*Moralizing God* denotes the share of the population in grid-cell g whose ancestors belonged to ethnic groups with moralizing gods in the pre-colonial era, *PD* and *Pop* control for population density and size, $\mathbf{X}$ denotes other grid-cell level controls, α_c is a vector of country dummies, and ε is a stochastic error term. Estimating (1) via OLS is likely to yield biased and inconsistent estimates for β_1. Even after controlling for an extensive set of covariates, the possibility that an unobserved factor affects both violence and belief systems cannot be ruled out. In order to reliably estimate β_1, we therefore need to isolate a source of variation in *Moralizing God* that affects conflict outcomes only through its effect on *Moralizing God*. The IV approach used in this paper uses ancestral settlement size and the distance to the point of origin of the nearest moralizing god as sources of variation in *Moralizing God*. The first-stage equation is then:

$$Moralizing\ God_g = \alpha_c + \gamma_1 SettlSize_g + \gamma_2 MoralDist_g + \gamma_3 PD_g + \gamma_4 Pop_g + \mathbf{X}_g\phi + \epsilon_g \quad (2)$$

The first IV used in this paper is ancestral settlement size, which is derived from Murdock (1967), and is rooted in early seminal research as well as recent research in the social sciences. The original variable denotes whether the representative settlement in each ethnic group comprised of fewer than 50 inhabitants, 50 to 100, some intermediate categories, 1,000 to 5,000, 5,000 to 50,000, or more than 50,000 people. The ancestral settlement size instrument is the share of the grid-cell's population whose ethnic ancestors hail from groups where settlement size exceeds 5,000. In *The Logic of Collective Action*, Olson (1965) explicitly mentions that the size of the community increases the free-rider problem. Norenzayan (2013) describes anonymity as the enemy of cooperation. Wade (2015) discusses the belief system of the Hadza, an ethnic group of approximately 1,000 people in north-central Tanzania. The Hadza do not believe in a moralizing god: they worship celestial objects, but without any moral dimension. Despite the lack of a moralizing god, the Hadza are very cooperative in everyday life, as they do not "need a supernatural force to encourage this, because everyone knows everyone else in their small bands. If you steal or lie, everyone will find out - and they might not want to cooperate with you anymore" (Wade, 2015, p. 20). In small communities like the Hadza, cooperation can be enforced through reputation mechanisms. This instrument exploits the stylized fact that larger cities provide anonymity: in larger communities, the reputational penalty that contract-breakers face is comparatively smaller. Incentives to deviate from cooperative norms therefore emerge. Unless some other coordination mechanism is binding, cooperation is expected to break down. This is where moralizing gods provide a solution. All-knowing gods with moral values emerge as a solution to the commitment problem and contracts can be enforced despite the lack of a reputation-based mechanism (Norenzayan 2013, Norenzayan and Shariff 2008). The choice of 5,000 as a cutoff is motivated by the expectation that, in towns of under 5,000, the reputation-based coordination mechanism should be effective, while the next highest category includes towns of up to 50,000, which is likely too large to support the reputation mechanism.

The second instrument, distance to the nearest moralizing god, is constructed as the distance between the grid-cell centroid and the centroid of the nearest ethnic group with a moralizing god in the pre-colonial era. This instrument exploits two plausible sources of exogeneity. First, the gridding process performed with GIS software is arbitrary, such that the exact point location of each grid-cell centroid

is deterministically drawn by the grid. Second, and most importantly, the emergence of cultural norms in general, and of moralizing gods in particular, is likely to be orthogonal to the characteristics of neighboring areas. The idea behind this instrument is that the diffusion of technology, broadly construed, follows a concentric pattern from the point of origin. As such, geographic proximity to a society with a moralizing god is a source of exogenous variation in the likelihood of emergence of a moralizing god in the home region. This instrument is closely related to instruments used in several recent contributions in the literature. In addition to the studies discussed in the introduction, Nunn (2008) and Nunn and Wantchekon (2011) respectively use the distance to the coast and the distance to major slave destinations as instruments for the intensity of raids and captures of people who were sold as slaves. Dittmar (2011) uses distance from Mainz, the birthplace of printing, as an instrument for the adoption of the printing press. Because the *homo sapiens* species originated in the horn of Africa, Ashraf and Galor (2013) use the distance to Addis Ababa as an instrument for genetic diversity. The critical assumption behind the identification strategy used in these studies is that the locations of the point-of-origins they use are exogenous. In this study, this particular assumption is likely to be true, as previous research (Botero *et al.*, 2014; Michalopoulos, 2012) has shown that the emergence of moralizing gods and ethnic groups, respectively, is well-explained by local geographic factors. This lends support to the view that the emergence of moralizing gods is likely to be orthogonal to the features of neighboring areas.

The exclusion restriction states that each instrument must not have a direct effect on contemporary conflict outcomes and must not be correlated with unobserved confounders. The first instrument, pre-colonial settlement size, is unlikely to have a direct effect on modern conflict outcomes, but an indirect effect cannot be ruled out entirely. This is why it is important to control for population size and density. If ancestral settlement size affects contemporary conflict outcomes through contemporary population variables, then their inclusion will remove this potential source of invalidity. The exclusion restriction for the second instrument will be satisfied as long as distance to the nearest moralizing god has no effect on conflict outcomes, other than through the likelihood of emergence of moralizing gods. In theory, it is possible that proximity to an ethnic group with a moralizing god could affect conflict through some other channel. Insofar as hypothetical other channels are also a function of geographic distance, explicitly accounting for spatial correlation addresses this potential source of invalidity. All specifications therefore use Conley's (1999) standard errors for cross-sectional spatial dependence of an unknown form. Conley standard errors model spatial dependence as a decaying function of geographic distance and assume no spatial correlation past a specified cutoff distance. The cutoff distance is set at 1000 km here; the results (shown in the appendix) are robust to alternate cutoffs.

4 Results

4.1 OLS Results

Tables 2 and 3 present OLS results. Across the board, there is a strong correlation between conflict casualties and the share of the population with a moralizing god tradition (Table 2). This result holds even after controlling for an extensive set of variables, taken at the grid-cell level, which are discussed in the IV results section below. Overall, a one standard deviation increase in the share of the population with a moralizing god is correlated with an increase in conflict deaths between 8 and 18% approximately, which is statistically and economically significant. Table 3 presents the results of regressing conflict prevalence on moralizing gods. The results are more mixed: in the more parsimonious specifications of Columns (1) and (2), *Moralizing God* is not statistically significant. It is however positive and significant

Table 2: Conflict Fatalities: OLS Estimates.

	Dependent Variable: ln(Fatalities)				
Independent Variables	(1)	(2)	(3)	(4)	(5)
Moralizing God	0.198***	0.164***	0.367***	0.197***	0.073**
	(0.059)	(0.039)	(0.047)	(0.046)	(0.042)
Agricultural Suitability		0.601***	0.594***	0.530***	0.599***
		(0.169)	(0.132)	(0.143)	(0.134)
Terrain Ruggedness		0.201***	0.1987***	0.244***	0.255***
		(0.020)	(0.019)	(0.018)	(0.018)
Infectious Disease Suitability		-0.722***	-0.773***	-0.814***	-0.839***
		(0.152)	(0.159)	(0.160)	(0.147)
Early Political Centralization			-0.648***	-0.697***	-0.628***
			(0.072)	(0.063)	(0.066)
Early Intensive Agriculture			0.077	-0.016	-0.100**
			(0.051)	(0.063)	(0.049)
Early Extended Family			0.174***	0.199***	0.092***
			(0.067)	(0.063)	(0.074)
% Christian				-0.437***	-0.236***
				(0.049)	(0.055)
% Muslim				-0.166	-0.036
				(0.220)	(0.229)
Split Group					0.478***
					(0.036)
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	11,829	11,829	11,829	11,762	11,762
Grid-Cells	496	496	496	478	478
R^2	0.29	0.31	0.32	0.31	0.31

Notes. Ordinary Least Squares estimates with Conley (1999) standard errors. Conley standard errors account for spatial correlation of an unknown form as a decaying function of geographic distance; the spatial correlation is assumed to be zero when the distance exceeds 1000 km. Population size, density and a constant term are included in all specifications. ***, ** and * denote significance at the 1, 5 and 10% levels respectively.

Table 3: Conflict Prevalence: OLS Estimates.

	Dependent Variable: s(Conflict)				
Independent Variables	(1)	(2)	(3)	(4)	(5)
Moralizing God	-0.003	-0.001	0.016***	0.017***	0.010***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Agricultural Suitability		0.074***	0.082***	0.084***	0.088***
		(0.013)	(0.012)	(0.011)	(0.011)
Terrain Ruggedness		0.121***	0.113***	0.120***	0.118***
		(0.019)	(0.015)	(0.016)	(0.016)
Infectious Disease Suitability		-0.042***	-0.066***	-0.059***	-0.067***
		(0.006)	(0.007)	(0.007)	(0.007)
Early Political Centralization			-0.033***	-0.036***	-0.035***
			(0.004)	(0.004)	(0.004)
Early Intensive Agriculture			-0.019***	-0.021***	-0.026***
			(0.002)	(0.002)	(0.002)
Early Extended Family			0.022***	0.024***	0.021***
			(0.004)	(0.004)	(0.004)
% Christian				-0.022***	-0.017***
				(0.006)	(0.006)
% Muslim				0.089***	0.085***
				(0.018)	(0.018)
Split Group					0.027***
					(0.002)
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	10,947	10,947	10,947	10,916	10,916
Grid-Cells	919	919	919	884	884
R^2	0.48	0.50	0.50	0.47	0.48

Notes. s(Conflict) is the share of years with conflict, to total years. In each grid-cell, a year is coded as a conflict year if the number of deaths exceeds 25 (following the convention in the conflict literature, see Blattman and Miguel 2010, p. 3). OLS estimates with Conley (1999) standard errors, which account for spatial correlation of an unknown form as a decaying function of geographic distance; the spatial correlation is assumed to be zero when the distance exceeds 1000 km. Population size, density and a constant term are included in all specifications. ***, ** and * denote significance at the 1, 5 and 10% levels respectively.

in Columns (3)-(5), which account for more covariates. This gives us some indication that OLS may be biased downward, as the addition of covariates causes the parameter of interest to increase significantly. This intuition will be confirmed in the IV results.

4.2 2SLS-IV Results: Overview

Tables 4 and 5 present the results of the 2SLS-IV regressions. The top, middle and bottom panels respectively display second stage results, first stage results, and additional information. The second stage results indicate that a one standard deviation increase in *Moralizing God* is expected to increase conflict fatalities by 18 to 37%, and conflict prevalence by 4 to 8% approximately. These effects are highly significant in all specifications. In the first stage, the two IVs are highly significant, of the expected sign, and relatively large in magnitude. Moreover, the two IVs are powerful: F-tests of excluded instruments range from 47.21 to 84.84. These values comfortably clear the Stock and Yogo (2005) critical value of 19.93. This indicates that the size of the IV bias is less than 10% of the OLS bias.

Although the first stage R^2 is by no means a panacea for model fit, its magnitude is informative as well. The first stage results suggest that 76 to 86% of the variation in *Moralizing God* is explained by the variables included in the regression. This provides support for the idea that the two IVs are capturing the bulk of the historical processes behind the emergence of moralizing gods. Importantly, the 2SLS-IV coefficients on *Moralizing God* are significantly larger than their OLS counterparts. In general, this can be interpreted as evidence that (i) OLS suffers from endogeneity, causing a downward bias; or (ii) the exclusion restriction may not hold.

If OLS is in fact biased downward, then adding relevant controls to the model should reduce the bias. This is the pattern that is seen in Table 3: whereas *Moralizing God* is insignificant in the first two columns, it becomes highly significant in Columns (3)-(5). This is consistent with (i) above; the following sections 4.3 and 4.4 examines (ii) and find substantive evidence in favor of the exclusion restriction.

4.3 Covariates as Checks on the Exclusion Restriction

The p-values for Sargan's overidentifying restrictions test come quite far from rejecting the null hypothesis of instrument validity, with all but one p-value ranging from 0.21 to 0.97. This indicates that no meaningful correlation is found between the instruments and the error term from the second stage regressions. In only one case (Column (2) of Table 5), Sargan's test only weakly rejects the null at the 10% level. In an ideal world where the exclusion restriction holds, there are no variables absent from the model through which the IVs affect the outcome variable. If the exclusion restriction holds, adding covariates to the model should not affect the instruments. This is what the bottom panel of Tables 4 and 5 show. The coefficients on the two IVs remain highly significant in all specifications and vary relatively little in size. This provides corroborating evidence consistent with the exclusion restriction.

Geographic Features

Column (2) of Tables 4 and 5 introduces a set of geographic controls which may affect both religiosity and violence. Soil suitability for agriculture (Ramankutty, Foley, Norman and McSweeney, 2002) potentially has a direct, albeit ambiguous, impact on violence. More fertile lands are akin to a more generous resource constraint, which should induce less fighting, but fighting could also increase as the returns to owning the economic pie increase. Infectious disease suitability is the malaria suitability index from Kiszewski *et al.* (2004). Infectious diseases are potentially correlated with both conflict and religion: Letendre, Fincher and Thornhill (2010) show that the spread of infectious diseases triggers the emergence

Table 4: 2SLS-IV Estimates: Conflict Fatalities.

	(1)	(2)	(3)	(4)	(5)
2SLS Results	Dependent Variable: ln(Fatalities)				
Moralizing God	0.762***	0.377**	0.746***	0.657***	0.545**
	(0.291)	(0.175)	(0.232)	(0.245)	(0.241)
Agricultural Suitability		0.665***	0.721	0.670***	0.670***
		(0.203)	(0.593)	(0.189)	(0.188)
Terrain Ruggedness		0.196***	0.190***	0.235***	0.239***
		(0.019)	(0.018)	(0.018)	(0.018)
Infectious Disease Suitability		-0.715***	-0.768***	-0.832***	-0.955***
		(0.156)	(0.164)	(0.161)	(0.146)
Early Political Centralization			-0.710***	-0.777***	-0.745***
			(0.086)	(0.075)	(0.074)
Early Intensive Agriculture			0.031	-0.078	-0.178***
			(0.049)	(0.069)	(0.056)
Early Extended Family			0.153***	0.181***	0.132**
			(0.059)	(0.060)	(0.064)
% Christian				-0.346***	-0.227***
				(0.062)	(0.052)
% Muslim				-0.219	-0.204
				(0.223)	(0.236)
Split Group					0.449***
					(0.054)
Sargan p-value	0.90	0.40	0.85	0.86	0.95
R^2	0.36	0.38	0.39	0.39	0.39
First Stage Results	Dependent Variable: Moralizing God				
Ancestral Settlement Size	0.127***	0.167***	0.093***	0.097***	0.084***
	(0.016)	(0.010)	(0.010)	(0.010)	(0.009)
Moral Dist	-0.067***	-0.068***	-0.064***	-0.067***	-0.066***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
F-test of excluded instruments	52.54	63.81	50.88	47.21	46.44
R^2	0.84	0.81	0.82	0.84	0.86
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	11,829	11,829	11,829	11,762	11,762
Grid-Cells	496	496	496	478	478

Notes. Two-Stage Least Squares (2SLS) estimates with Conley (1999) standard errors. Conley standard errors account for spatial correlation of an unknown form as a decaying function of geographic distance; the spatial correlation is assumed to be zero when the distance exceeds 1000 km. Results for alternate cutoffs are shown in the appendix. Population size, density and a constant term are included in all specifications. Second stage regressors are also included in first stage regressions. ***, ** and * denote significance at the 1, 5 and 10% levels respectively.

Table 5: 2SLS-IV Estimates: Conflict Onset.

	(1)	(2)	(3)	(4)	(5)
2SLS Results	Dependent Variable: s(Conflict)				
Moralizing God	0.121***	0.097***	0.153***	0.160***	0.162***
	(0.017)	(0.012)	(0.012)	(0.011)	(0.010)
Agricultural Suitability		0.096***	0.118***	0.126***	0.129***
		(0.014)	(0.013)	(0.012)	(0.012)
Terrain Ruggedness		0.098***	0.084***	0.085***	0.082***
		(0.018)	(0.016)	(0.017)	(0.018)
Infectious Disease Suitability		-0.042***	-0.078***	-0.070***	-0.074***
		(0.006)	(0.007)	(0.007)	(0.007)
Early Political Centralization			-0.061***	-0.067***	-0.067***
			(0.004)	(0.007)	(0.005)
Early Intensive Agriculture			-0.035***	-0.033***	-0.035***
			(0.002)	(0.002)	(0.002)
Early Extended Family			0.022***	0.025***	0.023***
			(0.004)	(0.004)	(0.004)
% Christian				0.013***	0.016***
				(0.006)	(0.006)
% Muslim				0.049***	0.046***
				(0.019)	(0.019)
Split Group					0.012***
					(0.002)
Sargan p-value	0.21	0.05	0.97	0.71	0.61
R^2	0.45	0.47	0.47	0.48	0.48
First Stage Results	Dependent Variable: Moralizing God				
Ancestral Settlement Size	0.140***	0.160***	0.057***	0.062***	0.044**
	(0.028)	(0.024)	(0.019)	(0.021)	(0.020)
Moral Dist	-0.050***	-0.052***	-0.051***	-0.046***	-0.047***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
F-test of excluded instruments	72.73	84.84	68.55	50.39	51.97
R^2	0.76	0.77	0.79	0.81	0.81
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	10,947	10,947	10,947	10,916	10,916
Grid-Cells	919	919	919	884	884

Notes. s(Conflict) is the share of years with conflict, to total years. In each grid-cell, a year is coded as a conflict year if the number of deaths exceeds 25 (following the convention in the conflict literature, see Blattman and Miguel 2010, p. 3). Two-Stage Least Squares (2SLS) estimates with Conley (1999) standard errors. Conley standard errors account for spatial correlation of an unknown form as a decaying function of geographic distance; the spatial correlation is assumed to be zero when the distance exceeds 1000 km. Results for alternate cutoffs are shown in the appendix. Population size, density and a constant term are included in all specifications. Second stage regressors are also included in first stage regressions. ***, ** and * denote significance at the 1, 5 and 10% levels respectively.

of ethnocentric cultural norms and in turn can cause conflict. Finally, terrain ruggedness (GLOBE *et al.*, 1999) can affect cultural norms because of increased isolation and difficulty of access from the outside, and also has a direct effect on armed conflict (Fearon and Laitin, 2003). Ruggedness is the sum change in elevation between each pixel and its eight adjacent pixels, averaged across the grid-cell.

Moralizing God remains highly significant when these variables are included in the regressions. On the whole, soil suitability for agriculture correlates positively with conflict fatalities. This corroborates the findings of Roes and Raymond (2003), who find that an increase in the size of the economic pie at stake increases the rents to controlling the pie, which affects conflict casualties positively. Terrain ruggedness is also found to have a positive effect on violence, which is in line with Fearon and Laitin's (2003) well-known result that mountainousness increases insurgency risk. Finally, infectious disease suitability is negatively correlated with conflict fatalities. This is somewhat surprising; a possible interpretation of this result could be Malthusian in nature: deaths due to infectious diseases could reduce the resource pressure and therefore lead to lower violence.

Ethnicity-Level Characteristics

In Column (3) of Tables 4 and 5, a set of potentially confounding ancestral ethnographic characteristics are included as additional regressors. These variables are constructed from Murdock's (1967) *Ethnographic Atlas*. First, I control for early political centralization, following the influential work of Diamond (1997). The inclusion of this control is motivated by the idea that state and religion have emerged jointly in many locations throughout history. Less centralized states at the ethnic group level have a poor record of maintaining order, such that the correlation observed between conflict and ancestral religion could be driven by omitted ancestral state capacity. This variable is constructed as the share of the population within each grid-cell whose ethnic ancestors had a centralized state. Second, it is important to control for early intensive agriculture. The timing of the agricultural transition is a robust determinant of long-term differences in economic development (Putterman and Weil, 2010); at the same time, conflict is affected by poverty (Blattman and Miguel, 2010) and it is likely that more historically affluent societies have evolved social norms that are traditionally less tolerant of violence. Because of historical affluence, societies with a history of intensive agriculture are also less likely to evolve moralizing gods. The agricultural intensity variable is the share of the population whose ethnic ancestors practiced intensive agriculture prior to European contact. The third ethnographic control, family structure, is the share of the population whose main mode of family organization in pre-colonial times was the extended family. There is evidence of two-way causality between family structure and religious values (Arland, 1985). Also, societies characterized by extended families often have clan-like structures with frequent between-clan violence (Reilly, 2001).

In the results, early political centralization is negatively associated with armed conflict fatalities, suggesting that ethnic groups with a long history of political centralization are better at preventing violence. This is consistent with the consensus in the literature that conflicts are more likely to occur when state capacity is low (Bates 2001, 2008; Herbst, 2000). Extended family traditions are strongly associated with violence, in line with Reilly (2001). Agricultural intensity enters the regression with a negative sign, but is not always significant. The evidence is therefore mixed as to whether historical affluence or recent income shocks (e.g. Hodler and Raschky, 2014; Couttenier and Soubeyran, 2014) are better conflict predictors.

Contemporary Religion

Column (4) of Tables 4 and 5 addresses the possibility that, if religion does cause conflict, then the

results may be driven by current rather than traditional belief systems. It is indeed plausible that, in trying to understand current violence, we may be better off looking at current beliefs rather than ethnic ancestors' beliefs in the pre-colonial era. To attend to this concern, I compute measures of contemporary religiosity (percentage Christian and percentage Muslim) at the grid-cell level, based on data from Joshua Project. Here, the results vary for conflict prevalence and conflict deadliness. Percentage Christian and Percentage Muslim are both strongly associated with increased incidence of conflict. Percentage Christian appears to reduce fatalities from conflict, while Percentage Muslim has no effect.

Partitioned Ethnic Groups

Column (5) of Tables 4 and 5 picks up on the theme of partitioned ethnic groups, which was covered extensively by Michalopoulos and Papaioannou (2016),[4] who exploit the arbitrary national border design during the Scramble for Africa to show that partitioning ethnic groups across national boundaries results in increased violence. In Column (5), I therefore include a *Split Group* dummy which is set equal to 1 if the grid-cell includes an ethnic group which appears in more than one country, and 0 otherwise. The results show that partitioned ethnicities do indeed affect conflict: grid-cells with a partitioned group experience significantly more frequent and more deadly conflict, but the size and significance of *Moralizing God* in the 2SLS results remains unaffected.

4.4 A Resampling-Based Approach to Testing for Overidentifying Restrictions

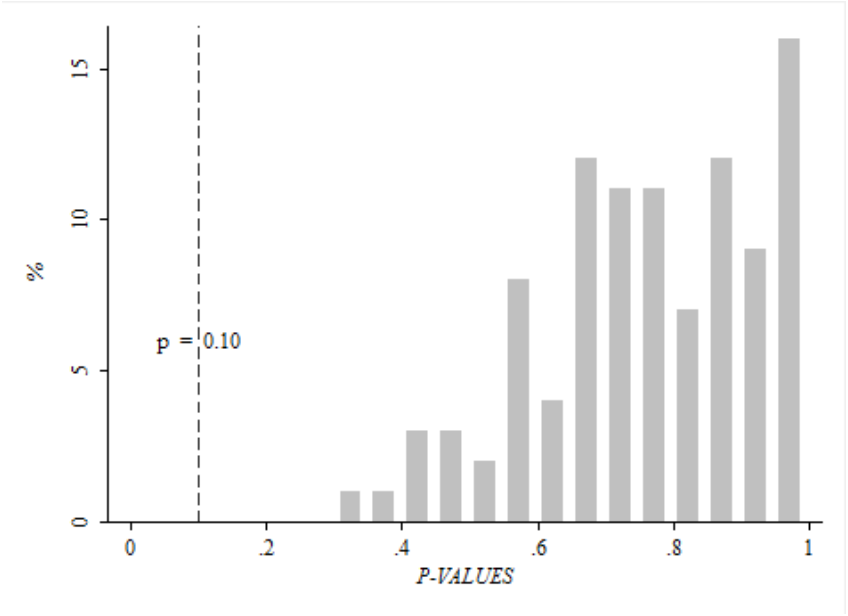
This section examines whether instrument validity is sensitive to the choice of samples used in Tables 4 and 5. If the instruments are invalid, then performing Sargan's test over many different samples should allow us to detect potential invalidity and reject the null, if appropriate. I therefore take a jackknife approach and re-estimate each of the specifications of Tables 4 and 5 (Column (5)), which use the full set of controls, over 100 random samples, dropping 10% of available observations each time. 200 p-values from Sargan's test are computed (100 for each dependent variable), and the distribution of those p-values is shown in Figure 4. None of the 200 p-values is smaller than 0.10, which provides additional support for the exclusion restriction.

5 Concluding Remarks

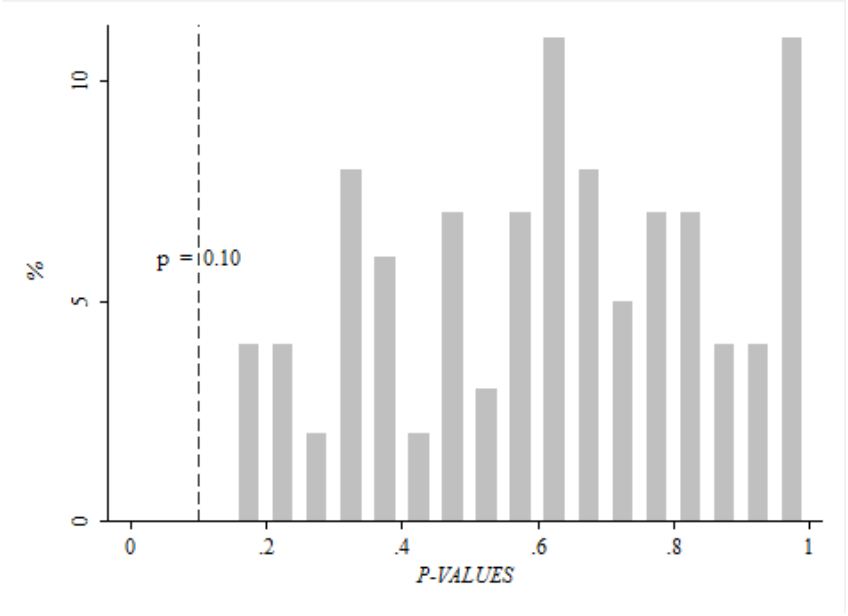
This research has examined the link between moralizing gods and conflict outcomes. Traditions of moralizing gods at the local level were instrumented with pre-colonial settlement size and geographic proximity to ethnic groups with moralizing gods, following recent research in evolutionary psychology and biology, and economics. The results suggest that moralizing god traditions have a significant, positive impact on conflict deaths, as suggested by the commitment problem hypothesis.

Although on the balance, moralizing gods are associated with more violence, it would be interesting, in further research, to examine whether the observed conflict deadliness is heterogeneous contingent on whether the fighting occurs within or between groups. This is a potentially fruitful question, which is not addressed in this paper due to data limitations. It may be tempting to think that ethno-religious groups have effective conflict resolution institutions for within-group conflict but not for between-group conflict, leading to violence only in the latter case, but the answer is likely to be different. Moralizing gods frequently serve as justifications for violence targeted at in-groups as well as out-groups. Religious

[4] I am thankful to an anonymous referee for suggesting this check.



Panel A. Dep. Var.: ln(Fatalities). Specification: Table 4 Column (5).



Panel B. Dep. Var.: s(Conflict). Specification: Table 5 Column (5).

Figure 4: Distribution of Sargan p-values.
Notes: p-values from 100 random samples, excluding 10% of observations at a time.
The dashed line indicates a p-value of 0.10.
Source: Author's calculations.

scriptures are often understood to sanction the killing of fellow group members, under more or less clear circumstances.

Finally, it is important to caution against an overreaching interpretation of the results in this paper. While the analysis does suggest that religion is causally associated with violence in today's world, this study does not comment on whether the world as a whole would have been a better place if moralizing gods had never appeared at all. Norenzayan (2013) suggests it is difficult to conceive of successful, cooperative large-scale societies emerging without a moralizing god providing an overarching commitment device. In his words, "societies with atheist majorities - some of the most cooperative, peaceful, and prosperous in the world - climbed religion's ladder, and then kicked it away."

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