Secularization Theory and Religion[*]

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ABSTRACT

What is the relationship between religion and human development? Using data from the pooled 1981-2014 World and European Values Surveys, we examine the effect of human development on a country's level of religious attendance and belief. Consistent with the idea that the primary causal mechanism underlying secularization theory has to do with the substitutability of secular and religious goods, we find that human development has a negative effect on religious attendance but no effect on religious belief. Our results indicate that as societies develop, we should not be surprised if religious belief remains high even as religious attendance declines. The negative effect of human development on religious attendance is driven primarily by a country's level of education and health. Our analysis suggests that it is important to think carefully about what one's theoretical model of the secularization process implies for different aspects of religion.

Religion remains a key driving force in the political world (Gill, 2001; Norris and Inglehart, 2004). It affects a wide range of phenomena such as voter behavior (Green, 2007; Esmer and Pettersson, 2007), political participation (Omelicheva, 2018; Driskell, Embry and Lyon, 2008), economic preferences for redistribution (Stegmueller, 2013; Jordan, 2014) and the welfare state (Gill and Lundsgaarde, 2004), as well as attitudes towards various social policies that lie at the heart of global culture wars (Inglehart and Baker, 2000; Layman, 2001). As a result, it's important to understand the determinants of religious behavior. In this research note, we reexamine the relationship between religion and human development.

Historically, secularization theory has been the dominant paradigm in studies of religion. Secularization theory focuses on the 'demand' for religion and predicts that religion will decline as societies develop. Over the last twenty years, though, secularization theory has come under sustained criticism for lacking empirical support and a clear causal story (Greeley, 1989; Finke and Stark, 1992; Stark and Finke, 2000). One scholar describes it as little more than "a hodgepodge of loosely employed ideas" (Hadden, 1987, 598). Responding to these criticisms, scholars have developed alternative models of religion, most notably the religious markets model. The religious markets model focuses on the 'supply' of religion and predicts that religion will flourish in countries where the state abstains from intervening in the religious marketplace and religious organizations are free to compete for adherents (Finke, 1990; Iannaccone, 1991; Chaves and Cann, 1992; Finke and Iannaccone, 1993; Stark and Iannaccone, 1994; Finke and Stark, 1998). In many ways, the religious markets model has come to dominate the contemporary study of religion.

Two recent studies, though, suggest that we may have been too quick to discard secularization theory (Gaskins, Golder and Siegel, 2013a,b). Importantly, these studies provide a formal model that lays out a clear causal pathway by which human development affects religion. The core insight in the GGS model, which incorporates both demand-side and supply-side explanations of religion, is that religious and secular benefits are often substitutes for one another. This means that the desire to secure religious goods declines with the ability to earn secular goods. Since the ability to earn secular goods increases with human development, religion will, as secularization theory predicts, decline as societies develop. Empirical studies critical of secularization theory have typically examined religion in the context of wealthy countries. This is problematic because these analyses lack sufficient variation in human development to appropriately evaluate secularization theory's predictions. In their recent studies, GGS evaluate their theoretical claims using a wide range of countries that exhibit significant variation in societal development. In line with secularization theory, they find a strong negative relationship between religion and human development.

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Secularization theorists differ over what they mean by the demise of religion. Specifically, they differ over whether it entails the decline of religious attendance, religious belief, or religion's role in the public sphere. GGS focus on *religious attendance* because the causal mechanism they propose for secularization theory rests on the substitutability of religious and secular goods. Their focus on religious attendance makes sense as it captures the intuition that being religious entails certain costs and that the benefits from being religious are often restricted to those who actively engage in religious activities. More time, effort, and money spent securing religious goods necessarily means receiving fewer secular goods, and vice versa. Not all religious goods, though, have secular substitutes. For example, it's not clear there are secular substitutes for all of the psychic benefits derived from religious belief. More importantly, there are no costs incurred in terms of foregone secular benefits if one simply believes in God. As a result, the GGS model provides no reason to expect that religious belief will decline with human development.

In this research note, we contribute to the existing literature by explicitly contrasting how human development affects religious attendance and religious belief. Our empirical analyses employ a significantly larger and more diverse dataset than previous studies. Consistent with the idea that the primary causal mechanism underlying secularization theory has to do with the substitutability of secular and religious goods, we find that human development has a negative effect on religious attendance but little effect on religious belief. Human development is a multifaceted concept. In the GGS model, it captures anything that increases the ability to obtain secular goods. In our analyses, human development is a composite measure that takes account of a country's level of education, health, and standard of living (UNDP, 2016). In order to see exactly what is driving the relationship between societal development and religion, we disaggregate our measure of human development. We find that none of the disaggregated factors have any effect on religious belief, and that the negative relationship between religious attendance and human development is driven primarily by a country's level of education and health. There is no evidence that supply-side features of the religious marketplace have an effect on either religious attendance or religious belief.

Theory

In the GGS model, individuals derive utility from both the secular and religious worlds. This utility can result from the consumption of material goods, such as cars or bequeathed alms, or from more psychic benefits, such as those that come from having a job or participating in group prayer. An individual's *secular* utility is determined by her net income — the more income she has, the more secular goods she can obtain.

The ability to earn income varies across individuals depending on things like their level of education and health. As countries develop, populations typically become more educated and healthier, and, as a result, one's ability to earn secular income increases. While the GGS model incorporates several factors that affect an individual's *religious* utility, two are of particular relevance here. The first is an individual's level of religious participation, which comprises the time, effort, and money devoted to religious practice. Religious goods and benefits are increasing in participation. The second is the level of pressure exerted by the state on religious participation. Some states repress and regulate religion, whereas others impose 'blue laws' designed to enforce religious standards and limit secular activities.

Individuals in the GGS model make two choices. First, they choose a level of doctrinal strictness, which may be zero, by affiliating with a particular denomination in the religious marketplace. Next, they choose a level of religious participation, which may also be zero. Individuals make these choices to maximize their expected utility from secular and religious goods. When choosing how much to participate in religious activities, individuals face a tradeoff "between the material and psychic goods . . . they can obtain via religious participation and the degree to which lost time, money, and effort devoted to religious participation detract from leisure time and the pursuit and enjoyment of secular goods" (Gaskins, Golder and Siegel, 2013*b*, 1128). The tradeoff exists because religious participation is viewed as a substitute for secular income. This tradeoff is conditioned by the way that states regulate religion. States that regulate religion raise the costs of religious participation, thereby increasing the relative benefits of seeking secular income. In contrast, states that encourage religious activity and allow competition in the religious marketplace lower the costs of religious participation, thereby decreasing the relative benefits of seeking secular income.

It follows from the substitutability of secular and religious goods that religious participation will be lower among those who have a high ability to earn secular income. Since the ability to earn secular income increases with human development, it also follows that religious participation should decline as societies develop. Religious participation should decrease with state regulations that suppress religious practice, but increase with state regulations that suppress secular practice. Each of these individual-level predictions apply at the aggregate level. In particular, human development should lead to less religious participation in a country because it leads to more individuals who earn high levels of secular income, each of whom has a greater incentive to reduce her religious participation. The predictions of the GGS model are, thus, in line with the basic claim of secularization theory that religion will decline as societies develop.[1]

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[1]The GGS model doesn't make the unsustainable claim that religion necessarily disappears as societies develop. The aggregate

The underlying causal mechanism proposed by GGS has to do with the substitutability of religious and secular goods. However, it isn't the case that the pursuit of religious goods always takes away from one's ability to pursue secular goods. Religion provides a wide range of benefits, including social insurance, afterlife, socialization, and doctrinal benefits. Social insurance benefits comprise psychic benefits, such as a sense of belonging and hope, as well as more material benefits, such as money, food, and other social services, in times of need. Afterlife benefits are benefits, such as going to Heaven, that religious believers expect to consume after they die. Socialization benefits include things like holding the same beliefs and engaging in the same religious activities as family and friends. Doctrinal benefits are those individuals receive from truly believing and acting in accordance with the doctrines of a religious faith. Some of these benefits can only be obtained by participating in religious activities, such as attending religious services. Pursuing these benefits necessarily takes away from one's ability to procure secular goods. Other benefits, though, such as doctrinal benefits or the psychic benefits derived from a sense of belonging and hope, can often be obtained through religious belief alone. These benefits can be obtained without forgoing the pursuit of secular goods — individuals can believe in God and engage in secular activity at the same time. This suggests that human development should have different effects on religious attendance and religious belief. Specifically, human development should lower religious attendance but have no effect on religious belief.[2]

Human Development Hypothesis (Religious Attendance): Religious attendance declines with human development.

Human Development Hypothesis (Religious Belief): To the extent that the secularization process is driven solely by the substitutability of secular and religious goods, there will be no relationship between religious belief and human development.

It's important to recognize that secularization theorists have proposed other, albeit loose, arguments for why religion will decline as societies develop. In particular, some scholars have argued that the rise of a rational worldview and the development of science cause people to lose faith in the superstitious dogma of religion (Berger, 1967; Martin, 1978). If these alternative causal mechanisms are at work, we may see both religious attendance and religious belief decline with human development.

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level of religious participation is expected to decline but at a declining rate, approaching a 'floor' determined by the population's preference for doctrinal strictness.

[2]Evidence consistent with these hypotheses comes from recent studies in the United States showing that the proportion of 'nones' — individuals who report no religious affiliation — is rising but that these individuals continue to exhibit high levels of spirituality and religious belief (Putnam and Campbell, 2010; Chaves, 2011).

In terms of the supply side, state regulations on religion should reduce religious attendance due to the substitutability of secular and religious goods, and the fact that regulations on religious activity increase the relative benefits of secular activity. There's no necessary tradeoff between religious belief and secular activity, though. Individuals can seek secular goods without reducing their religious belief. Moreover, states can't enforce regulations on private religious belief in the same way that they can enforce regulations on public religious practice. Thus, we wouldn't expect religious belief to decline with religious regulations.

> **Regulation of Religion Hypothesis (Religious Attendance)**: Religious attendance declines with regulations on religion.

> **Regulation of Religion Hypothesis (Religious Belief)**: To the extent that the secularization process is driven solely by the substitutability of secular and religious goods, there will be no relationship between religious belief and regulations on religion.

Empirical Analysis

To test our hypotheses, we created two dependent variables.[3] *Religious Attendance* is the average level of religious attendance in a country and is measured on a 1-8 scale, with 1 meaning that citizens practically never attend religious services and 8 meaning they attend more than once a week. *Religious Belief* is measured on a 0-1 scale and captures the proportion of individuals in a country who believe in God. Data come from the integrated 1981-2014 World and European Values Surveys (WVS, 2015; EVS, 2015).

On the demand side, our primary independent variable is the *Human Development Index (HDI)*, which is a composite index capturing three underlying dimensions: health, education, and standard of living (UNDP, 2016). The three dimensions are combined to produce a country's *HDI* score on a $0 - 1$ scale, with higher numbers indicating greater human development. We use the natural log of *HDI* to capture the idea, which comes directly from the GGS model, that religious attendance declines with societal development, but at a declining rate. *HDI* captures a broad notion of societal development. This is important as the relevant variable in the GGS model, which depends on human development, captures anything that affects individual income, including things like health and education. As our analyses indicate, our inferences hold even if we use the narrower measure of GDP per capita (Feenstra, Inklaar and Timmer, 2015).

On the supply side, we use two variables from the International Religious Freedom dataset to capture aspects of the religious market place and evaluate our hypotheses about religious regulations (Grim and

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[3]More information about our data can be found in Online Appendix A.

Finke, 2006). *Government regulation* is a $0 - 10$ index measuring the restrictions placed on religion by state actors, while *Social Regulation* is a $0 - 10$ index measuring the restrictions placed on religion by nonstate actors such as religious groups or the culture at large.

In line with Gaskins, Golder and Siegel (2013*a*,*b*), we also include several variables to control for other factors thought to affect religion. *Income Inequality* measures the Gini index of income inequality (Solt, 2016).[4] According to deprivation theory, inequality promotes religion by exacerbating existential security threats, thereby encouraging the poor to seek comfort in religion (Norris and Inglehart, 2004; Karakoç and Baskan, 2012). According to relative power theory, inequality promotes religion by exacerbating social tensions, thereby encouraging the rich to use religion as a means of social control (Solt, Habel and Grant, 2011). In contrast to these theories, the GGS model does not make a firm prediction about the impact of inequality on religion. The model recognizes that inequality may act as a threat that increases the fundamental desire for religious comfort. However, it also recognizes that increasing inequality can influence religion by changing a country's income distribution. The generality of the model's assumptions don't allow us to make a firm prediction about this second causal pathway as it's possible to construct special cases in which inequality increases or decreases religious activity.

Communist is a dichotomous variable indicating whether a country is communist. Although there's variation in the extent to which communist regimes suppress religion, the generally hostile stance of communist authorities towards religion should raise the cost of acting religiously. Moreover, it's well-documented that many communist countries use their education system to socialize their citizens into holding more secular beliefs (Van den Bercken, 1985; Froese, 2004; Ramet, 1998). Thus, we'd expect both religious attendance and religious belief to be lower in communist countries. *Postcommunist* is a dichotomous variable indicating whether a country has ever been communist. This variable captures the possibility that communism continues to have a negative effect on religion even after countries have transitioned to democracy. One reason for this is that religious institutions are less likely to have developed into key social institutions and will be less valuable as social networks. *Percent Catholic*, *Percent Protestant*, and *Percent Muslim* measure the population percentages that identify as Catholic, Protestant, and Muslim. The intuition here is that some religions place greater emphasis on religious adherence than others. Individuals who grow up in countries

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[4]As is well-documented, there is considerable measurement uncertainty when it comes to income inequality scores. *Income Inequality* comprises 100 distinct measures of income inequality that together are designed to accurately reflect this uncertainty (Solt, 2016). We incorporate the uncertainty in the inequality scores into our empirical analysis by running our statistical model 100 times, once for each of the different inequality scores, and averaging the results. The original analyses by GGS ignored the measurement uncertainty in their inequality estimates. For more information about *Income Inequality*, see Online Appendix A.

where these religions predominate are likely to be socialized into having greater religious sentiment.

To maximize comparability, we replicate the estimation strategy and model specification adopted by GGS (2013b). Our models are estimated using ordinary least squares (OLS) regression.[5] We don't employ country fixed effects for two reasons. First, almost a quarter of our countries are 'singletons' and would be dropped with the inclusion of country fixed effects. Second, our religious regulation (and other) variables are time invariant. As a result, including country fixed effects would result in the estimation of a demand-side only model of religion, which would be problematic. Country random effects are also problematic due to the very small number of observations per country (Clarke and Wheaton, 2007). We include UN-specified regional fixed effects to capture unobserved heterogeneity across regions, as well as dichotomous variables to capture common wave effects in the WVS-EVS surveys. Finally, we also employ cluster-robust standard errors to deal with any heteroskedasticity and the nonindependence of observations from the same country.

In Table 1, we report the results from two sets of models, one focusing on religious attendance and the other on religious belief. To provide some context for our results on religious attendance, we first show the equivalent results reported by GGS (2013b, 1132). Our sample is significantly larger and more diverse than that used by GGS. Due to our longer time frame, our sample has almost 80% more country-surveys and 25% more countries. As a reminder, the principal difference when it comes to the measurement of the covariates between our models and the GGS models is that we explicitly incorporate the measurement uncertainty in *Income Inequality* into our model estimations (see footnote 4). In three models, we employ *GDP per capita* rather than *HDI* as our measure of societal development.

As predicted, there is strong evidence that religious attendance declines with human development. This is evident from the negative and statistically significant coefficients on our two measures of societal development in all six religious attendance models. Also as predicted, there is little evidence that religious belief declines with human development. Although the coefficients on our measures of societal development are negative in the religious belief models, they do not reach conventional levels of statistical significance. Together, these results suggest that support for secularization theory writ large depends on whether we are considering religious attendance or religious belief. While religious attendance declines with human development, this doesn't necessarily seem to be the case for religious belief. Importantly, these results are consistent with the central theoretical claim in the GGS model that a key driving force in the secularization

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[5]One potential issue with OLS in the context of *Religious Belief* is that proportions are bounded between 0 and 1. We note, however, that our inferences are robust to using a two-sided tobit model and a generalized linear model with a logit link function.

Table 1: Determinants of Aggregate Religious Attendance and Belief

	DV: Average Level of Religious Attendance (1-8)						DV: Average Level of Religious Belief (0-1)		
	Gaskins, Golder, & Siegel (GGS)								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Demand Side									
ln(Human Development Index)	−4.56***	−4.40**	-	−1.25*	−1.84*	-	−0.29	−0.35	-
	(1.65)	(1.18)		(0.69)	(1.01)		(0.20)	(0.29)	
ln(GDP per capita)	-	-	−0.91***	-	-	−0.38**	-	-	−0.05
	-	-	(0.28)	-	-	(0.19)	-	-	(0.04)
Supply Side									
Government Regulation	−0.16***	−0.12**	−0.12**	−0.14**	−0.07	−0.07	−0.01	0.0005	−0.001
	(0.06)	(0.05)	(0.05)	(0.07)	(0.07)	(0.06)	(0.01)	(0.01)	(0.01)
Social Regulation	0.04	0.06	0.06	0.04	0.08	0.08	0.01	0.02*	0.02*
	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)	(0.06)	(0.01)	(0.01)	(0.01)
Controls									
Income Inequality	-	0.05***	0.04***	-	0.94	0.81	-	0.30	0.29
	-	(0.01)	(0.01)	-	(1.97)	(1.90)	-	(0.29)	(0.27)
Communist	-	−1.94*	−2.16	-	−1.35**	−1.44***	-	−0.42***	−0.42***
	-	(0.98)	(1.36)	-	(0.53)	(0.49)	-	(0.08)	(0.07)
Postcommunist	-	−1.46	−1.89	-	−0.41	−0.50	-	−0.10*	−0.11*
	-	(1.11)	(1.46)	-	(0.37)	(0.42)	-	(0.06)	(0.06)
Percent Catholic	-	0.02***	0.02***	-	0.01**	0.01**	-	0.002**	0.001*
	-	(0.01)	(0.01)	-	(0.01)	(0.005)	-	(0.001)	(0.001)
Percent Protestant	-	0.0003	0.0002	-	−0.01	−0.01	-	−0.001	−0.001
	-	(0.01)	(0.01)	-	(0.01)	(0.01)	-	(0.001)	(0.001)
Percent Muslim	-	0.01	−0.01	-	0.003	0.004	-	0.001	0.001
	-	(0.01)	(0.02)	-	(0.004)	(0.004)	-	(0.001)	(0.001)
Constant	3.90***	2.33**	5.46***	4.34***	2.29*	3.93***	0.85***	0.52**	0.78***
	(1.11)	(1.07)	(1.80)	(0.51)	(1.22)	(1.35)	(0.10)	(0.21)	(0.19)
Regional Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WVS Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	176	164	141	312	286	298	245	226	238
Countries	78	71	62	97	86	87	89	82	83
R^2	0.47	0.71	0.69	0.55	0.63	0.65	0.51	0.62	0.63

*$p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

Note: Cells show coefficients with robust standard errors clustered by country in parentheses. Models 1-3 replicate the results shown in Gaskins, Golder and Siegel (2013b, 1132). While our results are based on data from the 1981-2014 period, the results from GGS are based on data from the 1980-2004 period.

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process has to do with the substitutability of secular and religious goods.

Supply-side explanations of religion receive little support from our analyses. While the GGS results suggest that government regulations reduce religious attendance, this inference is not consistently supported by our larger and more diverse sample. Although the coefficients on *Government Regulation* remain negative, they are no longer statistically significant once the control variables are included. There is no evidence that government regulations ever have an effect on religious belief. The results with respect to *Social Regulation* are even weaker. There is no evidence, for example, that religious regulations imposed by non-state actors ever have a negative effect on religious attendance or religious belief. Indeed, the positive and statistically significant coefficients on *Social Regulation* in Models 8 and 9 suggest that, if anything, social regulations on religion may actually *increase* religious belief.

In terms of the control variables, there's strong evidence that religious attendance and religious belief are significantly lower in communist countries — the coefficients on *Communist* are always negative and are significant in five of the six models that include controls. Only the negative effect of communism on belief persists into the postcommunist period. While the coefficients on *Postcommunist* are negative, they're only significant in the belief models. These particular results suggest that attempts by communist countries to socialize their citizens into holding more secular beliefs can have a long-lasting effect on religion. Recent research has focused on the impact of inequality on religion. While the GGS results suggest that inequality increases religious attendance, our analyses indicate that this result doesn't hold in our larger and more diverse dataset once we take account of the measurement uncertainty that exists in the inequality scores.[6] We also find no evidence that inequality ever has an effect on religious belief. Finally, our results indicate that countries with large Catholic populations tend to have higher levels of religious attendance and belief.

HDI is a composite measure capturing a country's level of education, health, and standard of living. In Table 2, we present results from models where we disaggregate the individual components of the *HDI* measure. The results show that the negative relationship between human development and religious attendance is driven primarily by a country's level of education and health. This is indicated by the negative and significant coefficients on *Education Index* and *Health Index* in Models 1 and 2, and the insignificant coefficient on *Standard of Living Index* in Model 3. Consistent with the results in Table 1 and the idea that a key driving force in the secularization process has to do with the substitutability of secular and religious

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[6]Our decision to take account of the measurement uncertainty in the inequality scores in our analyses is particularly important. It turns out that the statistically significant results with respect to *Income Inequality* reported by GGS, and shown in Models 2 and 3, disappear if we incorporate the measurement uncertainty regarding income inequality into *their models and their sample*.

Table 2: Individual Components of the Human Development Index and Religion

	Average Level of Religious Attendance (1-8)			Average Level of Religious Belief (0-1)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Demand Side						
Life Expectancy Index	−2.62*	-	-	−0.42	-	-
	(1.50)	-	-	(0.31)	-	-
Education Index	-	−2.05*	-	-	−0.39	-
	-	(1.17)	-	-	(0.28)	-
Stanard of Living Index	-	-	−2.01	-	-	−0.30
	-	-	(1.30)	-	-	(0.29)
Supply Side						
Government Regulation	−0.06	−0.08	−0.06	−0.0002	−0.002	−0.00001
	(0.07)	(0.07)	(0.07)	(0.01)	(0.01)	(0.01)
Social Regulation	0.07	0.08	0.08	0.02*	−0.02*	0.02*
	(0.07)	(0.07)	(0.06)	(0.01)	(0.01)	(0.01)
Controls						
Income Inequality	1.23	0.95	1.26	0.34	0.31	0.34
	(1.95)	(1.99)	(1.90)	(0.29)	(0.28)	(0.26)
Communist	−1.31***	−1.27**	−1.48***	−0.41***	−0.41***	−0.42***
	(0.45)	(0.54)	(0.52)	(0.07)	(0.09)	(0.08)
Postcommunist	−0.31	−0.26	−0.43	−0.09*	−0.08	−0.11*
	(0.39)	(0.36)	(0.42)	(0.05)	(0.05)	(0.06)
Percent Catholic	0.01**	0.01**	0.01**	0.001*	0.002*	0.002**
	(0.01)	(0.01)	(0.005)	(0.001)	(0.001)	(0.001)
Percent Protestant	−0.01	−0.01	−0.01	−0.001	−0.001	−0.001
	(0.01)	(0.01)	(0.01)	(0.001)	(0.001)	(0.001)
Percent Muslim	0.004	0.002	0.004	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)
Constant	5.12***	4.15***	4.38**	1.00***	0.87***	0.87***
	(1.78)	(1.52)	(1.67)	(0.26)	(0.23)	(0.25)
Regional Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
WVS Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	298	286	298	238	226	238
Countries	87	86	87	83	82	83
R^2	0.64	0.63	0.65	0.63	0.62	0.63

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

Note: Cells show coefficients with robust standard errors clustered by country in parentheses. Models 1-3 show results with respect to religious attendance, while models 4-6 show results with respect to religious belief.

goods, we find little evidence that the individual *HDI* components influence religious belief. Although the coefficients on the *HDI* components are negative in the belief models, they do not reach conventional levels of statistical significance.

Conclusion

Secularization theory focuses on the 'demand' for religion and predicts that religion will decline as societies develop. Over the last twenty years, though, secularization theory has come under sustained criticism. This criticism has led to the development of alternative models of religion that focus on supply-side features of the religious marketplace. Two recent studies, though, suggest we may have been too quick to discard secularization theory. Incorporating both demand-side and supply-side explanations, Gaskins, Golder and Siegel (2013*a*,*b*) lay out a clear causal pathway by which religion declines with human development. The causal mechanism they propose rests on the assumption that secular and religious goods are often substitutes. As societies develop, the ability to secure secular goods increases and, as a result, people will shift away from seeking religious goods towards seeking secular goods.

However, it is not the case that the pursuit of religious goods always requires a reduction in secular activity. Religious benefits that can be obtained only through religious attendance lower the ability to produce secular goods, but religious benefits that can be obtained through religious belief do not. Thus, we should see a difference in how societal development affects religious attendance and religious belief. Specifically, and to the extent that the secularization process is driven solely by the substitutability of secular and religious goods, we should find that religious attendance, but not religious belief, declines with human development. Using a larger and more diverse dataset than previous studies, this is precisely what we find. Our results indicate that as societies develop, we should not be surprised if religious belief remains high even as religious attendance declines.[7] These results are consistent with recent studies in the United States showing that the proportion of religious 'nones' is increasing even while the proportion of those professing religious belief remains high (Putnam and Campbell, 2010; Chaves, 2011). To see exactly what's driving our results, we disaggregate our human development measure into its three component parts. We find that none of these component parts have any effect on religious belief, and that the negative relationship

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[7]Although we don't find a statistically significant relationship between religious belief and societal development, the estimated relationship is consistently negative. To the extent that this relationship is real, it suggests that other mechanisms besides the substitutability of secular and religious goods may play some role in the secularization process.

between religious attendance and human development is driven primarily by a country's level of education and health. Our analyses suggest that it's important to think carefully about what one's theoretical model of the secularization process implies for different aspects of religion. Depending on one's purported causal mechanism, we should expect only some aspects of religion to decline with human development.

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Online Appendix A: Data and Variables

In what follows, we provide more detail on our data and variables.

Dependent Variables

We start with our two dependent variables, *Religious Attendance* and *Religious Belief*, both of which are based on data found in the combined 1981-2015 World Values Survey (WVS, 2015) and the 1981-2008 European Values Survey (EVS, 2015). There are six waves in the World Values Survey data and four in the European Values Survey data. The data were downloaded on August 2, 2017.

1. *Religious Attendance* is based on the following question (f028) in the WVS and EVS codebooks:

> "Apart from weddings, funerals, and christenings, about how often do you attend religious services these days? More than once per week, once a week, once a month, only on special holy days, once a year, less often, or practically never?"

We reverse the original WVS-EVS scale for this variable so that higher values indicate higher levels of religious attendance. Aggregate data on *Religious Attendance* is produced by taking country-survey means. Ultimately, *Religious Attendance* is measured on a $1 - 8$ scale, with 1 meaning that respondents practically never attend religious services and 8 meaning that they attend more than once a week. After cleaning, our data has the following summary statistics: $N = 336$, $\mu = 4.33$, $\sigma = 1.29$. WVS-EVS data for this variable are available for the following countries and years:

> Albania [1998, 2002, 2008]; Algeria [2002, 2013]; Andorra [2005]; Argentina [1984, 1991, 1995, 1999, 2006, 2013]; Armenia [1997, 2008, 2011]; Australia [1981, 1995, 2005, 2012]; Austria [1990, 1999, 2008]; Azerbaijan [1997, 2011]; Bahrain [2014]; Bangladesh [1996, 2002]; Belarus [1990, 1996, 2000, 2008, 2011]; Belgium [1981, 1990, 1999, 2009]; Bosnia and Herzegovina [2001, 2008]; Brazil [1991, 2006, 2014]; Bulgaria [1991, 1997, 1999, 2005, 2008]; Burkina Faso [2007]; Canada [1982, 1990, 2000, 2006]; Chile [1990, 1996, 2000, 2006, 2011]; China [1990, 2001, 2007, 2012]; Colombia [1997, 1998, 2005, 2012]; Croatia [1996, 1999, 2008]; Cyprus [2006, 2008, 2011]; Czech Republic [1991, 1998, 1999, 2008]; Denmark [1981, 1990, 1999, 2008]; Dominican Republic [1996]; Ecuador [2013]; Egypt [2001, 2008, 2013]; El Salvador [1999]; Estonia [1996, 1999, 2008, 2011]; Ethiopia [2007]; Finland [1981, 1990, 1996, 2000, 2005, 2009]; France [1981, 1990, 1999, 2006, 2008]; Georgia [1996, 2008, 2009, 2014]; Germany [1981, 1990, 1997, 1999, 2006, 2008, 2013]; Ghana [2007, 2012]; Greece [1999, 2008]; Guatemala [2004]; Hungary [1982, 1991, 1998, 1999, 2008, 2009]; Iceland [1984, 1990, 1999, 2009]; India [1990, 1995, 2001, 2006, 2014]; Indonesia [2001, 2006]; Iran [2000, 2007]; Iraq [2004, 2006, 2012]; Ireland

[1981, 1990, 1999, 2008]; Italy [1981, 1990, 1999, 2005, 2009]; Japan [1981, 1990, 1995, 2000, 2005, 2010]; Jordan [2001, 2014]; Kazakhstan [2011]; Korea [1982, 1990, 1996, 2001, 2005, 2008, 2014]; Kosovo [2008]; Kyrgyzstan [2003, 2011]; Latvia [1990, 1996, 1999, 2008]; Lebanon [2013]; Libya [2014]; Lithuania [1997, 1999, 2008]; Luxembourg [1999, 2008]; Macedonia [1998, 2001, 2008]; Malaysia [2006, 2012]; Mali [2007]; Malta [1983, 1991, 1999, 2008]; Mexico [1981, 1990, 1995, 1996, 2000, 2005, 2012]; Moldova [1996, 2002, 2006, 2008]; Morocco [2007, 2011]; Netherlands [1981, 1990, 1999, 2006, 2008, 2012]; New Zealand [1998, 2004, 2011]; Nigeria [1990, 1995, 2000, 2011]; Norway [1982, 1990, 1996, 2007, 2008]; Pakistan [2001, 2012]; Peru [1996, 2001, 2006, 2012]; Philippines [1996, 2001, 2012]; Poland [1990, 1997, 1999, 2005, 2008, 2012]; Portugal [1990, 1999, 2008]; Romania [1993, 1998, 1999, 2005, 2008, 2012]; Russia [1990, 1995, 1999, 2006, 2008, 2011]; Rwanda [2007, 2012]; Saudi Arabia [2003]; Serbia [1996, 2001, 2005, 2008]; Singapore [2002, 2012]; Slovakia [1990, 1991, 1998, 1999, 2008]; Slovenia [1992 1995, 1999, 2005, 2008, 2011]; South Africa [1982, 1996, 2001, 2006, 2013]; Spain [1981, 1990, 1995, 1999, 2000, 2007, 2008, 2011]; Sweden [1982, 1990, 1996, 1999, 2006, 2009, 2011]; Switzerland [1989, 1996, 2007, 2008]; Taiwan [1994, 2006, 2012]; Tanzania [2001]; Thailand [2007, 2013]; Trinidad and Tobago [2006, 2011]; Tunisa [2013]; Turkey [1990, 1996, 2001, 2007, 2009, 2011]; Uganda [2001]; Ukraine [1996, 1999, 2006, 2008, 2011]; United Kingdom [1981, 1990, 1999, 2005, 2009]; United States [1982, 1990, 1995, 1999, 2006, 2011]; Uruguay [1996, 2006, 2011]; Uzbekistan [2011]; Venezuela [1996, 2000]; Vietnam [2001, 2006]; Yemen [2014]; Zambia [2007]; Zimbabwe [2001, 2012].

2. *Religious Belief* is based on the following question (f050) in the WVS and EVS codebooks:

"Do you believe in God?"

Religious Belief is a dichotomous variable that equals 1 if an individual believes in God and 0 otherwise. Aggregate data on *Religious Belief* is produced by taking country-survey means. After cleaning, our data has the following summary statistics: $N = 266$, $\mu = 0.82$, $\sigma = 0.18$. WVS-EVS data for this variable are available for the following countries and years:

Albania [1998, 2002, 2008]; Algeria [2002, 2013]; Argentina [1984, 1991, 1995, 1999, 2013]; Armenia [1997, 2008, 2011]; Australia [1981, 1995, 2012]; Austria [1990, 1999, 2008]; Azerbaijan [1997, 2011]; Bangladesh [1996, 2002]; Belarus [1990, 1996, 2000, 2008, 2011]; Belgium [1981, 1990, 1999, 2009]; Bosnia and Herzegovina [2001, 2008]; Brazil [1991, 2014]; Bulgaria [1991, 1997, 1999, 2008]; Canada [1982, 1990, 2000]; Chile [1990, 1996, 2000, 2011]; China [2012]; Colombia [1998, 2012]; Croatia [1996, 1999, 2008]; Cyprus [2008, 2011]; Czech Republic [1991, 1998, 1999, 2008]; Denmark [1981, 1990, 1999, 2008]; Dominican Republic [1996]; Ecuador [2013]; Egypt [2001]; El Salvador [1999]; Estonia [1996, 1999, 2008, 2011]; Finland [1990, 1996, 2000, 2009]; France [1981, 1990, 1999, 2008]; Georgia [1996, 2008, 2014]; Germany [1981, 1990, 1997, 1999, 2008, 2013]; Ghana [2012]; Greece [1999, 2008]; Hungary [1982, 1991, 1998, 1999, 2008]; Iceland [1984, 1990, 1999, 2009]; India [1990, 1995, 2001, 2014]; Indonesia [2001]; Iran [2000]; Iraq [2004, 2012]; Ireland [1981, 1990, 1999, 2008];

Italy [1981, 1990, 1999, 2009]; Japan [1981, 1990, 1995, 2000, 2010]; Jordan [2001, 2014]; Kazakhstan [2011]; Korea [1982, 2008, 2014]; Kosovo [2008]; Kyrgyzstan [2003, 2011]; Latvia [1990, 1996, 1999, 2008]; Lebanon [2013]; Libya [2014]; Lithuania [1997, 1999, 2008]; Luxembourg [1999, 2008]; Macedonia [1998, 2001, 2008]; Malaysia [2012]; Malta [1983, 1991, 1999, 2008]; Mexico [1981, 1990, 1995, 1996, 2000, 2012]; Moldova [1996, 2002, 2008]; Morocco [2011]; Netherlands [1981, 1990, 1999, 2008, 2012]; New Zealand [1998, 2011]; Nigeria [1990, 1995, 2000, 2011]; Norway [1982, 1990, 1996, 2008]; Pakistan [1997, 2001, 2012]; Peru [1996, 2001, 2012]; Philippines [1996, 2001, 2012]; Poland 1990, 1999, 2008, 2012]; Portugal [1990, 1999, 2008]; Romania [1993, 1998, 1999, 2008, 2012]; Russia [1990, 1995, 1999, 2008, 2011]; Rwanda [2012]; Saudi Arabia [2003]; Serbia [1996, 2001, 2008]; Singapore [2002, 2012]; Slovakia [1991, 1998, 1999, 2008]; Slovenia [1992 1995, 1999, 2008, 2011]; South Africa [1982, 1990, 1996, 2001, 2013]; Spain [1981, 1990, 1995, 1999, 2000, 2008, 2011]; Sweden [1982, 1990, 1996, 1999, 2009, 2011]; Switzerland [1996, 2008]; Taiwan [1994, 2012]; Tanzania [2001]; Thailand [2013]; Trinidad and Tobago [2011]; Turkey [1996, 2001, 2009, 2011]; Uganda [2001]; Ukraine [1996, 1999, 2008, 2011]; United Kingdom [1981, 1990, 1999, 2009]; United States [1982, 1990, 1995, 1999, 2011]; Uruguay [1996, 2011]; Uzbekistan [2011]; Venezuela [2000]; Vietnam [2001]; Zimbabwe [2001, 2012].

Independent Variables

Our empirical analyses contain variables that capture both the demand side and supply side of religion.

Demand Side

On the demand side, our primary independent variable is the *Human Development Index (HDI)*. We use the *Human Development Index* as our measure of societal development because it captures a broad notion of what constitutes human development. Annual *HDI* data from 1980 to 2015 come directly from the Human Development Report Office (UNDP, 2016).[1] We obtained the data on July 31, 2018.

3. *Human Development Index (HDI)* has a $0 - 1$ scale, and is a composite measure of a country's level of human development based on three underlying dimensions.

- Health Index: The health index measures life expectancy at birth. It is calculated as:

$$\text{Health Index} = \frac{\text{Average Age at Death} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}},$$

where the minimum and maximum values were taken as 20 years and 85 years, respectively.

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[1]Data for the 1980-2015 time period are not available in the various annual Human Development Reports themselves. We obtained the necessary data through direct communication with an analyst in the Human Development Report Office itself.

- Education Index: The education index measures the years of schooling in a country. It is composed of two subindices – expected years of education and mean years of education – that are combined to create the Education Index. The expected years of schooling index is calculated as:

$$\text{Expected Years of Schooling} = \frac{\text{Expected Years of Schooling} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}},$$

where the minimum and maximum values were taken as 0 years and 18 years, respectively. The mean years of schooling index is calculated as:

$$\text{Mean Years of Schooling Index} = \frac{\text{Mean Years of Schooling} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}},$$

where the minimum and maximum values were taken as 0 years and 15 years, respectively. Finally, the Education Index is calculated as:

$$\text{Education Index} = \frac{\text{Expected Years of Schooling Index} + \text{Mean Years of Schooling Index}}{2}.$$

- Standard of Living Index: The standard of living index is calculated using adjusted gross national income (GNI) per capita (PPP US$). It is calculated as:

$$\text{Standard of Living Index} = \frac{\ln(\text{Actual GNI}) - \ln(\text{Minimum Value})}{\ln(\text{Maximum Value}) - \ln(\text{Minimum Value})},$$

where the minimum and maximum values were taken as $100 and $75,000, respectively.

The *Human Development Index (HDI)* is calculated as the geometric mean of these three normalized indices:

$$\text{Human Development Index} = (\text{Education Index} \times \text{Health Index} \times \text{Standard of Living Index})^{\frac{1}{3}}.$$

More technical information about exactly how a country's HDI score is calculated can be found at http://hdr.undp.org/sites/default/files/hdr14_technical_notes.pdf. In terms of summary statistics, we have $N = 330$, $\mu = 0.74$, $\sigma = 0.12$.[2]

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[2]In Models 1-3 in Table 1 in the main text, we show the results reported by Gaskins, Golder and Siegel (2013*b*). The *HDI* measure used by GGS is calculated slightly differently to the one that we have just described. This difference simply reflects the fact that the United Nations Development Programme (UNDP) periodically changes how it calculates its *Human Development*

As a robustness check, we also use gross domestic product (GDP) per capita as a measure of societal development. Annual data on GDP per capita comes from version 9.0 of the Penn World Tables (Feenstra, Inklaar and Timmer, 2015). The data were downloaded on August 6, 2017.[3]

4. *GDP per capita* measures expenditure-side real GDP per capita in thousands of 2011 purchasing power parity US dollars. In terms of summary statistics, we have $N = 345$, $\mu = 19.11$, $\sigma = 15.29$.

Supply Side

Our primary focus in this paper is on the demand side of religion. However, we also incorporate the supply side of religion using variables from the aggregated International Religious Freedom (IRF) Data (Grim and Finke, 2006), which can be found in the Association of Religion Data Archive. The data were downloaded on August 4, 2017. Since 1999 U.S. embassies have produced an annual International Religious Freedom Report on their host country. Together these reports cover 196 countries. The IRF data codes these reports using a 243-item coding instrument (questionnaire). As Grim and Finke (2006, 9) note, "reporting adheres to a common set of guidelines, and training is given to embassy staff, who investigate the situation and prepare reports ... Once an embassy completes a report, this report is vetted by various State Department offices that have expertise in the affairs of that country and in human rights." The coding of all 196 countries was done by the lead rater. Two other raters coded 142 of the 196 countries. The inter-coder reliability was high, with a Cronbach's alpha of 0.9047 (Grim and Finke, 2006, 12). We use two variables from the IRF dataset: *Government Regulation* and *Social Regulation*.

5. *Government Regulation* is defined as the restrictions placed on the practice, profession, or selection of religion by the official laws, policies, or administrative actions of the state. *Government Regulation* is a summary measure coded on a 0-10 scale based on six underlying questions:

    1. Does the report mention whether foreign missionaries are allowed to operate. 0 = allowed and/or no

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Index. In our analyses, we use the most up-to-date data and calculation for the *HDI* measure. For those who are interested, a country's *HDI* score always combines information about health, education, and standard of living. However, the precise way in which this information is aggregated into a single measure has changed over time. As we have seen, the UNDP now calculates the HDI as (Education Index $\times$ Health Index $\times$ Standard of Living Index)$^{\frac{1}{3}}$. When GGS conducted their analyses, the HDI was calculated as $\frac{1}{3}$ Education Index $+ \frac{1}{3}$ Health Index $+ \frac{1}{3}$ Standard of Living Index. More information about exactly how the *HDI* score was calculated in the analyses conducted by Gaskins, Golder and Siegel (2013b) can be found in their Online Appendix B.

    [3]The GDP per capita data used by Gaskins, Golder and Siegel (2013b) come from version 6.1 of the Penn World Tables.

limits reported, 1 = allowed, but within restrictive limits, and 2 = prohibited.

2. Does the report mention that proselytizing, public preaching, or conversion is limited or restricted. 0 = no, 1 = yes, but (equally) for all religions, 2 = yes, but only for some religions.

3. Does the report indicate that the government interferes with an individual's right to worship? 0 = no, or no interference, 1 = some interference, 2 = severe interference.

4. How is freedom of religion described in the report? 0 = law/constitution provides for freedom of religion and the government 'generally respects' this right in practice, 1 = law/constitution provides for freedom of religion and the government generally respects this right in practice, but some problems exist, e.g., in certain locations, 2 = limited and/or rights are not protected, 3 = does not exist.

5. Does the report mention that the government 'generally respects' this right in practice? 0 = yes, 1 = yes, but exceptions or restrictions are mentioned, 2 = the phrase 'generally respects' is not used.

6. Does the report specifically mention that the government policy contributes to the generally free practice of religion. 0 = yes, 1 = yes, but exceptions are mentioned, 2 = no.

To construct *Government Regulation*, each of the six underlying variables was rescaled to a 0 to 1 range, and then multiplied by 1.6667 to give an additive maximum of 10 (Grim and Finke, 2006, 13). In terms of summary statistics, $N = 339$, $\mu = 2.86$, $\sigma = 2.76$.

6. *Social Regulation* is defined as the restrictions placed on the practice, profession, or selection of religion by other religious groups, associations, or the culture at large. This form of regulation might be tolerated or even encouraged by the state but is not formally endorsed or implemented by government action. *Social Regulation* is a summary measure coded on a 0-10 scale based on five underlying questions:

1. Social attitudes towards other or nontraditional religions are reported to be 0 - amicable, 1 = discriminatory (but not negative), 2a = negative just in certain areas, 2b = negative just wards certain religious branches, 3 = both 2a and 2b, 4 = hostile.

2. According to the report, what are social attitudes to conversions to other religions? 0 = no problems reported, 1 = some tension, 2 = negative, 3 = physically hostile.

3. Does the report mention that traditional attitudes and/or edicts of the clerical establishment strongly discourage proselytizing? 0 = no, 1 = yes.

4. According to the report, do established or existing religions try to shut out new religions in any way? 0 = no, 1 = yes.

5. What is the situation regarding social movements in relation to religious brands in the country? 0 = none or amicable, 1 = flashes of activity, 2 = regional and organized activity, 3 = national and organized activity.

To construct *Social Regulation*, each of the five underlying variables was re-scaled to a 0 to 1 range, and then multiplied by 2 to give an additive maximum of 10 (Grim and Finke, 2006, 19). In terms of summary statistics, $N = 339$, $\mu = 5.28$, $\sigma = 2.63$.

Controls

In order to match the empirical analyses conducted by Gaskins, Golder and Siegel (2013*b*), we included a number of control variables. One control variable, *Income Inequality* deserves more discussion and so we start with that.

7. *Income Inequality* is an estimate of the Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income. The data are from version 6.0 of the Standardized World Income Inequality Database (SWIID) (Solt, 2016).[4] SWIID uses "a missing-data multiple-imputation algortithm to standardize observations collected from the OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean generated by CEDLAS and the World Bank, Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, national statistical offices around the world, and academic studies while minimizing reliance on problematic assumptions by using as much information as possible from proximate years within the same country. The data collected by the Luxembourg Income Study is employed as the standard" (**?**). The SWIID maximizes the comparability of income inequality data across the broadest possible set of cases and is "ideal for broadly cross-national work" (Solt, 2016, 1280). The SWIID currently contains comparable Gini indices of income

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[4]In their original research, Gaskins, Golder and Siegel (2013*b*,*a*) measure income inequality using the Standardized Income Distribution Database (SIDD) from **?**. The SWIID dataset extends the coverage of this database and employs a more rigorous methodology for constructing cross-nationally comparable measures of income inequality.

inequality for 192 countries for as many years as possible from 1960 to the present. The data were down-loaded on August 5, 2017. In terms of our particular country-survey dataset, we have 320 observations on *Income Inequality*.

The fact that the SWIID attempts to combine information on inequality from numerous datasets means that its estimates of income inequality are measured with uncertainty. This measurement uncertainty is primarily a result of any remaining incomparability in the different measures of income inequality after the standardization procedure has been implemented. This uncertainty is captured in the way that SWIID, instead of reporting just one estimate of income inequality for each country-year, reports 100 income inequality estimates, each of which is a draw from the posterior distribution produced by the algorithm used to standardize the different sources of income inequality data. To incorporate this uncertainty into our empirical analyses, we run our statistical model 100 times, each time using a different one of the 100 variables that report the uncertainty in the SWIID estimates. We then report the average of these results.[5]

8. *Communist* is a dichotomous variable indicating whether a state is communist. $N = 348$, $\mu = 0.03$, $\sigma = 0.17$.

9. *Postcommunist* is a dichotomous variable indicating whether the state had previously been communist. $N = 348$, $\mu = 0.27$, $\sigma = 0.45$.

10-12. *Percent Catholic, Percent Protestant, Percent Muslim* measure the percentages of the population comprised by Catholics, Protestants, and Muslims. The data for these variables come from **?** and were downloaded on August 4, 2017. For *Percent Catholic*, the summary statistics are $N = 343$, $\mu = 31.96$, $\sigma = 36.01$; for *Percent Protestant*, the summary statistics are $N = 343$, $\mu = 16.90$, $\sigma = 26.81$; and for *Percent Muslim*, the summary statistics are $N = 343$, $\mu = 15.91$, $\sigma = 31.41$.

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[5]The data in the SIDD from **?** include only one estimate for income inequality. As a result, the original analyses by Gaskins, Golder and Siegel (2013*b*,*a*) did not take account of the uncertainty in their income inequality variable.