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Help or Hindrance? Religion's Impact on Gender Inequality in Attitudes and Outcomes

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Summary. — This paper investigates the effect of religiosity on attitudes toward gender equality using World Values Survey data. Results indicate that religiosity is strongly correlated with gender inequitable attitudes across countries. Further, OLS, TSLS, and 3SLS regression estimates reveal that gender inequitable attitudes are associated with negative effects on seven measures of gender equality of well-being and public policy. No single religion stands out as more gender inequitable than others. The impact of religiosity is likely transmitted via "stealth" effects on everyday behavior in economic transactions in labor markets, household resource allocation, and government spending.

Key words — religion, religiosity, gender inequality, well-being, economic growth

1. INTRODUCTION

Despite progress in some areas, gender inequality persists globally in key areas, such as income, education, economic security, and gender-related violence. Increased attention has been directed at the contribution of institutions to the perpetuation of gender stratification in recent years (Cavalcanti & Tavares, 2007; Guiso, Sapienza, & Zingales, 2003; Morrisson & Jütting, 2005; Sen, 1999, 2007). A good deal of evidence indicates that formal religious institutions, which shape cultural norms, social rules, and behaviors, have a measurable impact on the rigidity of gender roles and attitudes (Inglehart & Norris, 2003). There is little research, however, on whether those gender inequitable attitudes contribute to unequal outcomes for women.

Why might gender attitudes, induced by religious and other institutions, have a tangible effect on gender inequality in well-being? Embedded norms and stereotypes shape everyday behaviors and decision-making, ranging from choices about whether to lay off a woman or a man during economic downturns; to educate daughters or sons when money is scarce; or to promote a man or a woman into a managerial position. Credentials influence these decisions, of course. Objective external constraints are also part of the decision-making process (will an education increase a boy's income more than a girl's?). But in each case, the decision-maker inevitably assesses credentials through the lens of an internal gender ranking rule, influenced by external social conditions and the norms and stereotypes embedded in culture. That ranking rule is a reflection of an underlying set of power relations that are an enactment of the degree of gender stratification a society will tolerate.

Economists have sought to explain gender inequalities in wages, producing a large body of research that finds roughly 20–30% of wage gaps cannot be accounted for by gender-related productivity differences (Weichselbaumer & Winter-Ebmer, 2005). The unexplained portion of gender wage gaps has been attributed to discrimination, but economists have not progressed very far in empirically identifying the mechanisms that account for discriminatory decision-making. It is plausible that at least some of the unexplained one-third of gender wage gaps and other forms of measured gender inequality can be traced to institutions—including religious institutions—that contribute to gender hierarchal attitudes.

This paper seeks to shed light on two aspects of the role of institutions in perpetuating inequality. First, we evaluate the data to assess the contribution of religious institutions to the perpetuation of gender ideology, norms, and stereotypes, and thus social attitudes that legitimate gender inequality in social, economic, and political spheres. We do this using cross-country data on gender attitudes from the World Values Survey (WVS). The survey data permit an assessment of the effect of individuals' degree of religiosity and their religious denomination on attitudes toward gender equality. The gender attitude questions concern rigidity of gender identity, women's roles as mothers and workers, and beliefs about gender hierarchy in employment, education, and politics. We take this analysis one step further to explore whether differences in religiosity of citizens can explain cross-country variation in objective measures of gender equality in well-being.

2. RELIGION, RELIGIOSITY, GENDER

The role of religion in perpetuating norms that promote gender inequitable attitudes is complex because religious institutions themselves are not monolithic. A wide variety of voices are in evidence in religious organizations, even if dominated by hierarchical authorities. Through internal debates and struggles, religious doctrines, norms, and rules can change over time, albeit at a relatively slow pace. In hierarchical structures, however, a dominant factor in shaping gender attitudes is the views held by those at the top of the religious structure at any given point in time.

There are several explanations for why the gender norms that religious institutions instill might be gender inequitable.

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The first relates to religiosity as a response to economic insecurity and the second underscores the role of hierarchy in formal institutions. With regard to the former, the intensity of religious beliefs has been posited to be a response to economic insecurity and the stage of economic development (Norris & Inglehart, 2004). Assuming the link between religion and economic security is valid, we might anticipate that individuals under stress have a need for clear, rigid rules, including behavioral norms. Further, in such circumstances, survival instincts elevate the goal of high fertility in the face of excessive infant and adult mortality rates. In such a scenario, attitudes toward gender roles may be rigid and dichotomous in response to a struggle for economic survival.

The organizational structures that characterize most major religions may be a second factor. To varying degrees, the dominant organized religions have access to and control over material resources, and as such, exercise power to create and maintain social norms that perpetuate structures of power to preserve their control. Elite groups tend to capture power in institutions, and thus, patriarchal dominance in the economic sphere is likely to be replicated in religious organizations. Seen in this light, religious institutions may reflect patriarchal [1] values in order to buttress the economic, social, and political power of males to the disadvantage of women (Kardam, 2005; Norris & Inglehart, 2004; Sen, 2007). Whatever their other roles, such as solace and even social support, if religious institutions inculcate gender norms and rules that disadvantage women, they may hinder policy efforts aimed at closing gender gaps in important areas, such as education and employment.

Where norms that embody gender hierarchy and rigid roles dominate the social landscape, the heterosexual family and women's primary role as (unpaid) caretaker are emphasized. Divorce, abortion, and homosexuality contradict the social roles prescribed for women (and by implication, delineate separate roles for men) and tend to be viewed unfavorably. Further, sons tend to be more valued than daughters in patriarchal contexts.

If organized religions in their current state do indeed perpetuate gender inequitable attitudes, we might expect that people who exhibit higher degrees of religiosity hold more gender inequitable attitudes. An important question is whether the incidence of gender unequal attitudes in a country translates into gender inequality of outcomes. In other words, is there evidence that gender inequality in measures of well-being is more pronounced in countries exhibiting a greater degree of religiosity?

It is useful to consider why religiosity and dominant religion might have an impact not only on attitudes but also on real economic outcomes. Two transmission mechanisms exist. First, at the micro level, gender unequal attitudes act as a "stealth" factor, shaping everyday decisions. Employers' choices on whom to hire and whom to lay off are affected by norms regarding who in the gender hierarchy is most deserving of a job. Families make decisions on which family member should undertake paid labor or unpaid caring labor. We, therefore, might anticipate that insofar as religiosity affects norms and attitudes, there will be consequent measurable effects at the country level on gender gaps in education, the sex ratio, and shares of the labor force, to name a few.

The second transmission mechanism is the effect of religious attitudes on a government's distribution of resources (for example, for education and health care) and regulation, such as enactment and enforcement of anti-discrimination legislation in employment, and rules on access to loans, inheritance, and property ownership. In countries with dominant religions that are gender inequitable, it is possible that gender outcomes are worsened through the government channel as well.

An individual's religious denomination may influence gender norms and outcomes, implying that some religions could be more patriarchal than others. However, whether any one organized religion is more patriarchal than others is an empirical question on which there is as yet no consensus. Psacharopoulos and Tzannatos (1989) find that Muslims, Hindus, and Catholics have lower female labor force participation rates than other religions and the non-religious. Islam has been identified as significantly more patriarchal than other dominant religions on such measures as education and life expectancy (Baliamoune-Lutz, 2007; Dollar & Gatti, 1999; Fish, 2002; Forsythe & Korzeniewicz, 2000) although some recent empirical evidence challenges that view (Donno & Russet, 2004; Noland, 2005).

The debate is clearly not yet resolved. Nevertheless, these findings suggest that in addition to a person's religiosity, religious denomination may also influence gender attitudes. Based on this discussion, we hypothesize that the greater the degree of religiosity a person exhibits, the more likely s(he) is to hold gender inequitable attitudes. We make no theoretical predictions *vis-à-vis* the effect of a person's adherence to a particular religious denomination.

It is important to note that we are not able to precisely identify causality from religiosity to gender attitudes although we can assess correlation. This reflects the understanding that religiosity is itself a produced social condition, linked to, for example, the size of the welfare state, cultural value patterns, historical conditions, and social divisions that might lead to religious identification as a form of group solidarity (Verweij, Ester, & Nauta, 1997). There are thus feedback loops between broader cultural, economic, and social conditions that manifest in religious formations.

3. EMPIRICAL ANALYSIS OF RELIGIOSITY AND GENDER ATTITUDES

(a) *Data and measures of religiosity and gender attitudes*

The empirical analysis that assesses the relationship between religiosity and gender attitudes is based on data from the World Values Survey (WVS). The survey has produced a complex dataset with over 300,000 respondents covering a range of issues including family, environment, work, religion, gender, government, and politics. This large-scale survey has been carried out in a series of five waves (1981–84, 1989–93, 1994–99, 1999–2004, and 2005–08). It provides coverage of 90% of the world's population, generating representative national data for 97 countries and regions (see Table A.1 for the country sample used in this analysis; WVS regions were omitted). The number of countries surveyed has expanded over time, and as a result, the country sample changes in each wave. [2] Waves 2–5 are used in the statistical analysis that follows due to the limited country coverage of Wave 1, but the descriptive data analysis includes all waves.

The intensity of religious beliefs is conveyed in a variety of WVS questions. As they are strongly correlated, the following question is used in the empirical analysis due to its broad coverage: (1) *How important is religion in your life?* A second set of questions measure exposure to religious institutions and participation in religious activities. The questions are: (2) *Do you belong to a religious denomination?* (3) *If yes, what religious denomination do you belong to?* And (4) *Apart from weddings,*

funerals, and christenings, about how often do you attend religious services these days?

It is necessary to measure both the intensity of religious beliefs and religious participation because for some religions, such as Buddhism, regular attendance at religious services is not a customary feature of practice. Question 4, in contrast, captures the intensity of an individual's exposure to religious teachings. We might expect that those with higher levels of participation have more opportunity to be inculcated with religious teachings that influence gender attitudes. Since people's attitudes toward gender may be influenced by their exposure to religious beliefs, even if they are currently not practicing, it is also necessary to control for the impact of the country's dominant religion in our empirical analysis.

Gender attitudes are captured in the following two groups of questions. The first group relates to attitudes toward women's role as mother, and more generally, gender roles: (5) *A woman needs children in order to be fulfilled* (agree?); (6) *Approve of woman as single parent* (agree?); (7) *A working mother can establish as warm secure a relationship with children as a mother who does not work* (agree?); and (8–9) *Can abortion (divorce) be justified always, never be justified, or something in between?* The second set of questions reflects attitudes toward gender hierarchies in employment, income, political power, and education: (10) *When jobs are scarce, men should have more right to a job than women* (agree?); (11) *Problem if women have more income than husband* (agree?); (12) *On the whole, men make better political leaders than women do* (agree?); and (13) *A university education is more important for a boy than for a girl* (agree?). [3]

Table 1 summarizes descriptive statistics for the WVS questions used in this study. It also provides details on the precise wording of questions, measurement of variables, and recoding. Gender attitude variables have been recoded so that a higher value reflects a more gender inequitable attitude. All religion variables have been recoded so that a higher value reflects a greater degree of religiosity and participation.

(b) *Empirical analysis of impact of religiosity on gender attitudes*

Using multivariate regression techniques, [4] we estimate the impact of religiosity and the individual's declared religious affiliation on gender attitudes for the entire WVS country sample, controlling for other individual characteristics that can influence gender attitudes. [5] The gender of the respondent, coded as 1 for males and 0 for females, is included as an explanatory variable. If men benefit materially from gender inequality, regardless of whether they are religious, we hypothesize they may hold more gender hierarchical attitudes. On the other hand, men may be less inclined than women to exhibit religious tendencies insofar as on average men experience less economic insecurity than women. Thus, we have no *a priori* expectations about the direction or size of the effect of gender on attitudes in the presence of controls on religiosity.

Education and household income are controlled for, consistent with previous research, which finds these variables to be correlated with attitudes toward women (Del Boca & Locatelli, 2006; Heineck, 2004). Education is coded on an 8-point scale in response to the question *What is the highest level of education you have attained?*, with university education or more coded as 1. Income is coded in response to the question: *Here is a scale of incomes. We would like to know in what group your household is, counting all wages, salaries, pensions, and other incomes that come in. Just give the letter your household falls into before taxes and other deductions*. The variable used in this analysis is measured on a 3-point scale (recoded from a 10-point scale) where the highest income group is coded as 1.

Age is measured in years. The respondent's age captures cohort effects, that is, generational shifts in gender attitudes. Why might age influence attitudes? First, religious teachings may evolve over time. Second, younger people on average have had less exposure to organized religions, and as a result, less social conditioning that could contribute to unequal attitudes. Finally, as more women engage in paid work outside the home, children may adopt less traditional attitudes regarding gender roles (Fernandez, Fogli, & Olivetti, 2004; Seguino, 2007a). Regrettably, the data do not allow us to differentiate between the individual impacts of these three hypotheses in the analysis that follows.

Religious denominations have been recoded into nine groupings: all major denominations (Buddhist, Catholic, Hindu, Jewish, Muslim, Orthodox, Protestant), the grouping "other" for minor religions, and the percentage reporting no religious affiliation. [6] A number of criticisms can be leveled against the groupings used in this analysis. Noland (2005) notes, for example, that Islamic practice varies widely across both time and space. Lumping together all countries for which Islam is the dominant religion, therefore, may be too broad to be analytically meaningful. A similar claim can be made with regard to Protestantism, a religion that has sprouted a number of splinter groups with very different tenets than the mainstream group. These concerns suggest caution in interpreting the effects of dominant religions.

The individual's religious denomination is measured as a dummy variable and the omitted group is "no religion." The coefficients measure the additional effect of an individual's religious denomination relative to the group that declares no religious affiliation. Institutions and cultural practices at the country level may also affect gender attitudes. We, therefore, estimate a fixed effects model with robust standard errors and include dummy variables for survey waves to control for trends over time in gender attitudes. [7]

The estimated equation is of the form:

$$GA_j = \beta_0 + \alpha_i + \beta_1 R1_j + \beta_2 R2_j + \beta_3 Gender_j + \beta_4 Age_j + \beta_5 Ed_j + \beta_6 Y_j + \beta_7 D1_j \ldots \beta_{14} D8_j + \beta_{15} W1_j \ldots \beta_{17} W3_j + \varepsilon_j \quad (1)$$

where GA_j is one of the 9 the gender attitude questions for the jth individual, α is the fixed effect for country i, $R1$ and $R2$ are the religiosity measures (importance of religion and religious participation), *Gender* and *Age* are as previously defined, *Ed* is education, Y is income, $D1$–$D8$ are dummies for the major religious denominations, $W1$–$W3$ are wave dummies, and ε is the error term.

Table 2 reports the results obtained from regressing each gender attitude question on the explanatory variables for all countries in the pooled World Values Survey. While the amount of data appears daunting to digest, the results are in fact quite straightforward and unambiguous with regard to the effect of religiosity on gender attitudes. For all gender attitudes questions, the importance of religion in the individual's life is positively associated with gender inequitable attitudes. The frequency of attendance at religious services (denoted "religious participation" in Table 2) is associated with gender inequitable attitudes for 7 of the 9 questions. The religious participation variable is measured on an 8-point scale as compared to a 4-point scale for religiosity, which partially explains the relative sizes of the coefficient. If measured on the same scale, however, the size of the participation effect would still

Table 1. *Summary statistics of WVS religiosity, gender, and political attitude variables*

		Mean	S.D.	Minimum	Maximum	Number of obs.	Original coding	Recoded
	Religiosity, beliefs, and religious participation							
1	How important is religion in your life?	2.949	1.075	1	4	306,376	Very impt = 1	Very impt = 4
2	Do you belong to a religious denomination?	0.801	0.400	0	1	256,487	Yes = 1	*No change*
3	Religious denomination							
4	Apart from weddings, funerals and christenings, about how often do you attend religious services these days?	4.517	2.507	0	8	324,765	More than once a week=1	More than once a week=8
	Gender attitudes and beliefs							
5	Do you think that a woman has to have children in order to be fulfilled or is this not necessary?	0.613	0.487	0	1	242,724	Needs children = 1	*No change*
6	If a woman wants to have a child as a single parent but she doesn't want to have a stable relationship with a man, do you approve or disapprove?	1.100	0.952	1	2	317,100	Approve = 1, disapprove = 0, depends = 2	Disapprove = 2, 1 = depends, 0 = approve
7	A working mother can establish as warm secure relationship with children as a mother who does not work.	2.047	0.873	1	4	219,094	Agree strongly = 1	*No change*
8	Can abortion be justified always, never be justified, or something in between?	7.287	2.935	1	10	318,944	Never justified = 1	Never justified = 10
9	Can divorce be justified always, never be justified, or something in between?	6.206	3.047	1	10	322,810	Never justified = 1	Never justified = 10
10	Agree or disagree? When jobs are scarce men should have more right to a job than women.	1.982	0.881	1	3	302,968	Agree = 1	Agree = 3, neither = 2, disagree = 1
	Do you agree strongly, agree, disagree, or disagree strongly with the following?							
11	If a woman earns more money than her husband, it's almost certain to cause problems.	2.527	0.900	1	4	67,990	Agree strongly = 1	Agree strongly = 4
12	On the whole, men make better political leaders than women do.	2.569	0.974	1	4	196,642	Agree strongly = 1	Agree strongly = 4
13	A university education is more important for a boy than for a girl.	2.038	0.918	1	4	201,094	Agree strongly = 1	Agree strongly = 4
	The role of government and church							
14	It would be better for [this country] if more people with strong religious beliefs held public office.	3.081	1.271	1	5	140,341	Agree strongly = 1	Agree strongly = 5
15	Religious leaders should not influence government.	2.258	1.129	1	5	127,205	Agree strongly = 1	*No change*

Table 2. *Religiosity, religion, and gender attitudes*

Independent variables	Woman needs children to be fulfilled (agree?)	Approve of woman as single parent (disagree?)	A working mother can establish as warm secure relationship with children as mother who does not work (disagree?)	Can abortion be justified, always, never, or something in between? (never justified?)	Can divorce be justified, always, never, or something in between? (never justified?)	When jobs scarce, men deserve jobs more than women (agree?)	Problem if women have more income than husband (agree?)	Men make better political leaders than women (agree?)	A university education is more important for boy than girl (agree?)
Religion important	0.023	0.058	0.012	0.521	0.414	0.051	0.033	0.040	0.038
	(0.004)***	(0.01)***	(0.007)*	(0.03)***	(0.03)***	(0.007)***	(0.01)***	(0.01)***	(0.01)***
Religious participation	0.005	0.021	0.009	0.109	0.108	0.007	0.003	0.004	0.008
	(0.002)***	(0.004)***	(0.002)***	(0.01)***	(0.01)***	(0.003)**	(0.01)	(0.003)	(0.003)***
Gender	0.009	0.071	0.160	0.154	0.149	0.174	0.044	0.275	0.221
	(0.004)**	(0.01)***	(0.01)***	(0.03)***	(0.04)***	(0.01)***	(0.03)	(0.01)***	(0.01)***
Age	0.003	0.004	0.001	0.011	0.014	0.004	0.001	0.003	0.003
	(0.0002)***	(0.0005)***	(0.0003)***	(0.011)***	(0.002)***	(0.001)***	(0.001)*	(0.0004)***	(0.0004)***
Education	0.015	0.016	0.025	0.062	0.076	0.034	0.026	0.024	0.032
	(0.002)***	(0.003)***	(0.003)***	(0.001)***	(0.01)***	(0.004)***	(0.003)***	(0.003)***	(0.004)***
Income	0.016	0.004	0.036	0.107	0.089	0.023	0.040	0.025	0.030
	(0.003)***	(0.005)	(0.006)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.004)***	(0.005)***
Buddhist	0.009	−0.005	0.049	−0.045	0.251	0.031	0.081	0.068	0.100
	(0.02)	(0.03)	(0.04)	(0.08)	(0.09)***	(0.04)	(0.03)**	(0.03)***	(0.03)***
Hindu	0.062	0.152	0.027	0.319	0.604	0.005	0.042	−0.040	−0.065
	(0.01)***	(0.04)***	(0.04)	(0.10)***	(0.061)***	(0.04)	(0.03)	(0.05)	(0.06)
Jew	0.064	0.080	−0.012	−0.760	−0.464	−0.050	−0.059	−0.024	0.093
	(0.03)**	(0.07)	(0.06)	(0.44)*	(0.29)*	(0.06)	(0.06)	(0.06)	(0.07)
Muslim	0.056	0.129	0.041	0.418	0.237	0.068	0.060	0.057	0.015
	(0.02)***	(0.07)*	(0.03)	(0.13)***	(0.19)	(0.05)	(0.04)	(0.04)	(0.07)
Orthodox	0.014	0.072	−0.012	−0.037	−0.072	−0.040	−0.006	−0.041	−0.024
	(0.01)	(0.04)**	(0.02)	(0.08)	(0.09)	(0.02)*	(0.03)	(0.03)	(0.04)
Other religion	0.024	0.125	0.086	0.352	0.548	0.030	0.024	−0.0005	−0.022
	(0.01)**	(0.04)***	(0.02)***	(0.09)***	(0.13)***	(0.03)	(0.03)	(0.03)	(0.03)
Protestant	−0.006	0.047	0.029	0.224	0.295	−0.055	0.020	−0.001	−0.049
	(0.02)	(0.03)*	(0.02)*	(0.08)***	(0.08)***	(0.03)**	(0.02)	(0.03)	(0.03)*
Catholic	0.028	0.005	0.017	0.284	0.182	0.001	0.010	−0.008	−0.009
	(0.01)***	(0.02)	(0.20)	(0.07)***	(0.07)***	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.207	0.299	1.602	3.167	2.527	1.434	1.892	1.861	1.258
	(0.04)***	(0.07)***	(0.16)***	(0.32)***	(0.21)***	(0.07)***	(0.12)***	(0.05)***	(0.06)***
Number of obs.	139,709	194,996	138,212	195,447	198,020	204,108	52,008	158,459	161,543
Adj. R^2	0.043	0.109	0.031	0.184	0.120	0.089	0.015	0.052	0.041
No. of countries	81	92	77	93	93	93	44	81	81

Notes: Robust standard errors in parentheses. All regressions include a country fixed effect and wave dummy variables. The gender dummy variable takes the value of 0 for females and 1 for males. Estimation is performed using STATA 11.0.

*$p < 0.10$.

**$p < 0.05$.

***$p < 0.01$.

be smaller than the effect of importance of religion in a person's life. This implies that the notion that exposure to religious doctrines through frequent attendance at services is responsible for gender inequitable attitudes is not well supported by the data. Religious values are apparently internalized through a variety of avenues, regardless of whether a person attends services or not. [8]

All denominations are associated with more gender inequitable attitudes relative to the "no religious affiliation" group on at least some of the questions. Most religious denominations are associated with restrictive attitudes on abortion and divorce compared to the "no religion" reference group. It is notable that religious denomination, more generally, has only a limited effect on attitudes in response to the prompts *It is a problem if women have more income than their husbands*; *Men make better political leaders*; and *A university education is more important for a boy than girl*. No major religious denomination stands out as being significantly more strongly associated with gender inequitable attitudes than the others. It is notable, however, that Protestants, Buddhists, and Hindus hold significantly more gender inequitable attitudes than the non-religious on 4 out of 9 of gender attitudes questions, more than the remaining major denominations.

We turn now to the control variables, which are themselves of independent interest. On all but one question, men hold significantly more unequal gender attitudes than women, after controlling for differences in education, age, income, and religion. These results highlight an interesting contradiction in women's collective identities as women and religious persons, given that they are on average more religious than men. [9]

Older individuals hold more gender inequitable attitudes than the young on average. This may reflect the impact of a trend toward more gender equitable attitudes globally. With women's increased labor force participation in many countries, it is possible that the young hold more gender equitable attitudes because they see mothers and other adult women taking on a wider array of roles in society, including in paid work. This is consistent with social role theory, which argues that gender attitudes are strongly impacted by children's observation of the gender roles of parents and other adults (Eagly & Diekman, 2003).

As expected, education contributes to gender-equalizing attitudes. Individuals from higher income households also hold more gender equitable attitudes, an effect that is significantly positive for all but one gender attitude question. Interestingly, household income level is not positively correlated with degree of approval of women as single mothers, suggestive of the way that gender roles are modified as the need for two household incomes rises.

4. CONTRIBUTION OF RELIGIOSITY TO GENDER OUTCOMES

We now turn to an exploration of religiosity's relationship with objective measures of gender equality via the effect on gender attitudes and views on the role of religion in government. It is useful to reiterate the possible transmission mechanisms from religion to gender outcomes. Insofar as religions inculcate attitudes that promote a gender hierarchy and rigid gender roles with women as caretakers, there can be direct effects in everyday behavior that disadvantage women. Women may feel pressure to quit work when they have children. Employers may hire or promote men over women. Parents may invest more resources in boys than girls.

An indirect effect is the influence of religious attitudes on government policies. The stronger the belief that religion should guide government decisions, the more likely we are to observe gender inequitable policies, rules, and distribution of resources, contributing to gender inequality in material well-being. Figure 1 describes pathways by which the effects of religiosity are transmitted to gender outcomes, with arrows indicating the direction of causality and hypothesized signs of the relationships noted.

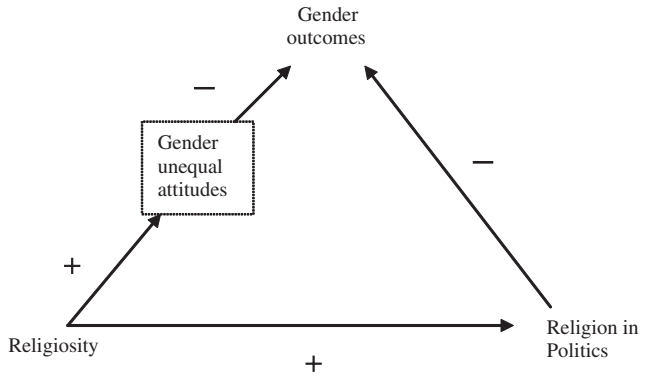

Figure 1. *Religiosity impacts on gender well-being outcomes.*

(a) *Data*

(i) *Dependent variables: gender equality in well-being*

Six individual gender well-being indicators are employed as dependent variables: the ratio of females to males in the population, the ratio of female-to-male primary and secondary gross school enrollment rates, female share of the labor force, female share of professional and technical positions, the percentage of births attended by skilled personnel, and maternity leave compensation. The latter is a measure of effective weeks of paid maternity leave. [10]

Each of these measures can be critiqued on conceptual grounds or in terms of measurement error. School enrollment ratios are gross, rather than net, and do not measure the quality of education (Grown, 2008). The female share of the labor force is not an accurate measure of economic activity as surveys frequently under-enumerate women's economic activity in agricultural economies (classifying some women as "not in the labor force"). Women's share of professional and technical positions draws from outcomes in the formal sector of the economy, reflecting primarily elite women's access to jobs of high status. Scholars have rightly raised concerns about the absence of more comprehensive measures that could assess women's differential care burden, gender-based violence, and gender empowerment (Cueva Betata, 2006; Folbre, 2006; Grown, 2008). These problems, duly noted, are suggestive of the ongoing challenges faced in accurately measuring gender gaps in well-being.

In addition to individual measures of gender equality in well-being, we employ a composite measure, the Social Watch's Gender Equality Index (GEI). The GEI assesses the degree of gender equality in three domains: empowerment (% of women in technical positions, % of women in management and government positions, % of women in parliaments, and % of women in ministerial posts); economic activity (income and labor force participation gap); and education (gaps in literacy, primary, and secondary school enrollment rate, and tertiary education). This measure incorporates some of Dijkstra's (2006) recommendations for formulating a true gender inequality measure, avoiding the pitfalls of previous measures, such as the Gender Development Index (GDI) and the Gender Empowerment Measure (GEM), which also capture

a country's level of development, and are, therefore, not strictly inequality measures. The GEI is calculated as an average of the mean values obtained in the three dimensions. [11] The data used to measure gender gaps in income, it should be noted, is based on imputing a value of the female to the male wage of 0.75 for countries that do not have gender-disaggregated wage data under the argument the global average wage gap is approximated by that value. To some extent then, the GEI also suffers from measurement error.

(ii) *Explanatory variables*

In order to summarize the effects of individual beliefs reflected in the WVS gender attitudes questions, an index was created. The index is calculated as the country average of responses to gender Questions 5, 7, 8 and 10 in Table 1. The scales of responses to questions differ (see Table 1) and so weights were calculated to ensure each question has an equal weight in the index.

The rationale for limiting the group of questions to form the composite index is twofold. First, missing observations for some of the questions would have reduced the sample size beyond an acceptable level. Second, the index emphasizes those attitudes that can lead to concrete gender differences in material outcomes. [12] Question 10 (*Men have more right to a job when jobs are scarce*) is most closely linked to gender hierarchical attitudes that can create unequal outcomes in a variety of domains although the remaining three questions used to form this index also reflect attitudes that can constrain women's economic choices and access to resources. As with the individual gender attitude questions, the index is measured such that a higher value indicates more unequal gender attitudes.

To conduct this analysis, we must control for other macro-level factors affecting gender equality in well-being. Several prior studies have explored the determinants of gender equality in well-being (without, however, exploring the impact of religiosity). Aggregate well-being, measured as GDP, is ubiquitously included as an explanatory variable though with contradictory evidence on its impact on equality (Baliamoune-Lutz, 2007; Dollar, 1999; Donno & Russett, 2004; Forsythe & Korzeniewicz, 2000; Seguino, 2007b). Why might the level of GDP affect gender equality? As a country's *per capita* income rises, more resources can be shared with women: (1) at the household level, because higher incomes leave more resources for female members of the family, who previously received a smaller share; (2) due to higher levels of government spending, insofar as these increase female access to education and health care, and (3) if job creation disproportionately affects women, increasing the opportunity cost of discrimination against women and increasing women's bargaining power. Income is measured as the natural log of *per capita* GDP in constant $2000. We also include the logged square of *per capita* GDP to account for non-linearities (that is, the possibility that the size of the effect of *per capita* GDP on gender well-being declines at higher levels of income). A weakness of the GDP measure is that it gives us little indication of the role of gender in the paid economy.

The degree of social expenditures also matters for gender well-being (related to point 2 above), net of the level of *per capita* income. As countries like China and Cuba have demonstrated, significant public expenditures on public health can extend life expectancy in otherwise low-income countries. It can also reduce competition over resources, potentially creating more space for movement toward gender equality. To capture social expenditures, we use the natural log of life expectancy, [13] a variable that reflects the extensiveness and efficacy of public health expenditures.

(b) *Estimation*

To explore the effect of religiosity on gender equality in well-being, we employ three estimation techniques: simple OLS, two-stage least squares (TSLS), and three-stage least squares (3SLS) multiple-equation estimation. For the OLS estimates, each of the objective gender indicators is regressed on the gender attitudes index with *per capita* GDP, *per capita* GDP squared, and life expectancy as controls: The estimated equation is:

$$\mathrm{GE}_i = \alpha_0 + \alpha_1 \mathrm{GDP}_i + \alpha_2 \mathrm{GDP}_i^2 + \alpha_3 \mathrm{LE}_i + \alpha_4 \mathrm{GAI}_i + \upsilon_i \qquad (2)$$

where GE is one of 7 gender equality variables for country i, GDP is measured in natural logs, LE is life expectancy also measured in natural logs, GAI is the gender attitudes index, and υ is the error term. Data for the gender well-being variables are for the most recent year available. Lagged values of *per capita* GDP and life expectancy (averaged over the period 1990–2000) are employed in order to address the problem of potential feedback effects from gender well-being to *per capita* GDP and development. The assumption that GDP is endogenous reflects insights from a rich literature on the effect of gender equality on economic growth (Cavalcanti & Tavares, 2007; Esteve-Volart, 2004; Klasen, 2002; Seguino, 2000).

TSLS is used to address the possibility that gender attitudes are not exogenous. Attitudes may be influenced by women's relative material status. For example, if women's share of the labor force or professional and managerial jobs is low, their subordinate status could be reflected in gender attitudes. TSLS eliminates the potential bias in the gender attitudes index due to endogeneity by removing that portion of gender attitudes that is correlated with the residuals. It also provides a robustness check on the OLS regressions since the sample size will vary due to the inclusion of instruments of varying availability. Instruments for gender attitudes are the religiosity variables (Questions 1 and 4 in Table 1), dummies for the dominant religion in the country, the remaining exogenous variables in the OLS regressions, and two questions measuring attitudes toward the role of religion in politics (Questions 14 and 15 in Table 1). [14]

The 3SLS procedure consists of estimating a three-equation system of equations simultaneously with gender inequality in well-being, gender attitudes, and *per capita* GDP all treated as endogenous variables. The specification for the first equation in the 3-equation system, gender equality in well-being, is identical to that shown above in Eqn. (2), with the exception that *per capita* GDP and its square as well as life expectancy are averaged over the period 1995–2005.

The specification for the second equation in the 3SLS estimation, gender attitudes, is:

$$\mathrm{GAI}_i = \gamma_0 + \gamma_1 R1_i + \gamma_2 R2_i + \gamma_3 RP1_i + \gamma_4 RP2_i + \gamma_5 D1 \ldots + \gamma_{12} D8_i + \upsilon_i \qquad (3)$$

where $R1$ and $R2$ are our two key religiosity variables (importance of religion and religious participation), $RP1$ and $RP2$ are religion and politics variables (Questions 14 and 15 in Table 1), $D1 \ldots D8$ are dummies for the dominant religion in the country, and v is the error term.

The specification of the third equation in the 3SLS estimation, *per capita* GDP, is:

$$\mathrm{GDP}_i = \delta_0 + \delta_1 RD_i + \delta_2 RD_i^2 + \delta_3 M2_i + \delta_4 M2_i^2 + \delta_5 \mathrm{FSH}_i + \delta_6 \mathrm{RED}_i + \eta_i \qquad (4)$$

where RD is expenditures on research and development (R&D) as a percentage of GDP in country i; $M2$ is the money

supply as a percentage of GDP, measured as the sum of currency, demand deposits, savings, and foreign currency deposits; FSH is female share of the labor force; RED is the ratio of female-to-male primary and secondary school enrollment rates; and η is the error term.

This specification takes into account insights from the gender and growth literature. Female share of the labor force and the ratio of female-to-male school enrollment ratios have been argued to have positive effects on GDP, based on a selection distortion argument—greater gender balance in labor force participation and education draws more heavily from the available pool of talent, thus stimulating efficiency and national income (Klasen & Lamanna, 2009).

R&D expenditures are an indicator of the pace of innovation in an economy and thus a determinant of economic growth, and by implication can be used to explain cross-country differences in the level of GDP. *M*2 as a percentage of GDP is employed to capture the stimulus to spending and growth (within limits) induced by an expansion of the money supply. [15]

Per capita GDP in Eqn. (4) is for 2005. *M*2 and its square, life expectancy, female share of the labor force, and the female/male enrollment rate variable are averaged over 1995–2005 while R&D is the average for 1996–2005. The following exogenous variables are used as instruments in all three equations in the 3SLS estimates: R&D and its square, *M*2 and its square, life expectancy, the religiosity and religion and politics variables, and dominant religion dummies. Table 3 gives summary statistics and data sources of the variables used in the analysis.

(c) *Results*

Results of the three econometric exercises are presented in Table 4. With regard to the 3SLS results, because the focus of this paper is on the impact of religiosity, only the estimates associated with gender inequality in well-being are reported there. The complete 3SLS results are reported in Table A.2.

Turning to the determinants of the composite measure of gender equality in well-being (the GEI), GDP and GDP squared have statistically significant effects on gender equality only in the OLS regression. [16] The coefficient on life expectancy is positive but not significant. The gender attitudes index has a negative effect on the GEI in all three statistical approaches. The size of this impact is quite large. Measured at the mean and using the 3SLS results, a one-unit increase in the gender attitudes index (approximately a 9% increase) contributes to a 10% decline in the GEI.

Note that the sample size changes with the three statistical methods, ranging from 43 to 73. The similarity of the results across the three methods despite the change in sample size (due to missing data for some of the variables added in the TSLS and 3SLS regressions) is indicative of the robustness of these results. The significant negative effect of gender attitudes in the TSLS and 3SLS regressions at the 1% level is notable since these methods essentially isolate the effect of that portion of gender inequality attitudes related to the degree of religiosity in a country. More precisely, the TSLS and 3SLS regression results reflect the effect of religiosity, attitudes toward politics in religion, and dominant religions on gender inequality in well-being, via their impact on gender attitudes.

The female-to-male population ratio and the ratio of female-to-male primary and secondary school gross enrollment rates produce similar results to the GEI, with the exception of the effect of *per capita* GDP. In contrast to the GEI, as living standards rise, gender equality, measured as female-

Table 3. *Summary statistics for variables in gender well-being regressions*

Variable	Mean	S.D.	Minimum	Maximum	Number of obs.	Period	Source
Gender Equality Index	66.26	1.19	40.00	89.00	87	2008	Social Watch
F/M population ratio	101.74	5.25	81.00	115.00	91	2005	*Human Development Report 2008*
F/M gross primary and secondary school enrollment (%)	101.28	8.81	74.00	117.0	88	2007	*Human Development Report 2008*
Female share of labor force (%)	41.80	7.40	14.82	51.38	89	2005	World Development Indicators CD-ROM 2008
Female share of professional and technical workers	49.51	10.26	22.00	71.00	89	Latest year 1997–2006	*Human Development Report 2008*
Births attended by skilled health personnel	87.54	2.93	6.00	100.00	61	Latest year 2003–05	World Development Indicators CD-ROM 2008
Paid maternity leave equivalency in weeks	12.70	6.68	0.00	45.00	74	2001	APESMA Professional Women's Network
Log *per capita* GDP constant 2000 $	3.54	0.69	2.09	4.65	92	Average 1995–2005	World Development Indicators CD-ROM 2006
Gender Attitudes Index	10.58	1.61	6.75	14.11	79	Average 1989–2005	World Values Survey
Log life expectancy	4.25	0.16	3.73	4.01	91	Average 1995–2005	World Development Indicators CD-ROM 2008
R&D as % GDP	1.03	0.93	0.02	4.21	79	Average 1995–2005	World Development Indicators CD-ROM 2008
M2 as % GDP	52.29	42.83	9.69	218.69	77	Average 1995–2005	World Development Indicators CD-ROM 2008

Note: Paid maternity leave equivalency in weeks calculated from data on weeks paid time and percentage of pay replaced.

Table 4. *Influence of religiosity on gender well-being outcomes*

Independent variables	Gender Equality Index			F/M population ratio			F/M primary and secondary school enrollment ratio		
	OLS	TSLS	3SLS	OLS	TSLS	3SLS	OLS	TSLS	3SLS
GDP	30.815	25.437	9.763	35.045	39.329	40.034	49.143	38.723	33.946
	(17.64)*	(16.93)	(19.66)	(9.20)***	(10.29)***	(15.10)***	(14.61)***	(12.68)***	(19.76)*
GDP^2	−4.797	−4.606	−2.008	−5.608	−6.283	−6.592	−7.217	−6.066	−5.299
	(2.45)*	(2.36)**	(2.86)	(1.37)***	(1.59)***	(2.19)***	(2.05)***	(1.80)***	(2.84)*
Life expectancy	0.173	0.076	−3.259	6.161	6.931	8.412	5.208	3.741	0.817
	(3.54)	(3.25)	(4.79)	(3.56)**	(3.03)**	(3.69)**	(3.72)	(3.45)	(4.80)
Gender index	−6.356	−7.921	−6.533	−2.274	−2.684	−3.102	−3.326	−3.978	−4.601
	(0.64)***	(1.01)***	(0.98)***	(0.63)***	(0.69)***	(0.75)***	(0.80)***	(1.04)***	(0.96)***
Constant	86.214	119.621	141.563	48.199	43.046	43.663	35.018	70.184	96.536
	(40.33)**	(40.23)***	(40.12)***	(21.34)***	(19.55)**	(30.82)***	(31.43)	(29.91)***	(40.15)**
Number of obs.	73	59	43	76	61	43	72	59	42
Adj. R^2	0.612			0.274			0.405		

	Female share of labor force			Female share of professional and technical positions			Births attended by skilled health personnel (%)			Maternity leave compensation		
	OLS	TSLS	3SLS	OLS	TSLS	3SLS	OLS	TSLS	3SLS	OLS	TSLS	3SLS
GDP	−6.619	−8.717	−10.011	67.953	72.351	36.542	149.723	148.392	71.652	9.797	20.284	26.334
	(10.83)	(10.74)	(15.20)	(23.44)***	(25.30)***	(29.04)	(43.67)***	(42.21)***	(44.62)	(16.11)	(15.27)	(29.25)
GDP^2	−0.039	0.298	0.415	−10.705	−11.632	−6.639	−20.602	−20.669	−8.689	−1.597	−3.282	−4.069
	(1.51)	(1.49)	(2.21)	(3.31)*	(3.64)***	(4.23)	(6.14)***	(5.94)***	(6.54)	(2.36)	(2.22)	(4.18)
Life expectancy	2.111	1.983	0.608	1.325	1.917	−0.376	−0.470	−4.503	−17.138	−9.781	−9.245	14.720
	(2.67)	(2.49)	(3.71)	(5.28)	(5.41)	(7.27)	(11.13)	(11.50)	(11.55)	(7.86)	(8.16)	(6.91)**
Gender index	−4.564	−4.223	−4.899	−5.251	−6.346	−6.328	−6.379	−7.772	−7.432	−1.687	−1.870	−2.141
	(0.66)***	(0.64)***	(0.75)***	(0.89)***	(1.48)***	(1.64)***	(1.74)***	(2.73)***	(2.52)***	(0.78)**	(1.05)*	(1.28)*
Constant	104.786	105.104	120.892	−2.078	3.691	77.148	−101.731	−66.309	100.128	58.408	42.824	57.059
	(27.50)***	(26.08)***	(31.03)***	(46.63)***	(50.99)	(60.54)	(91.29)	(95.93)	(99.31)	(48.05)	(49.53)	(56.97)
Number of obs.	75	60	43	66	53	39	51	40	38	61	49	33
Adj. R^2	0.528			0.386			0.567			0.156		

Notes: Robust standard errors in parentheses. GDP measured in natural logs. Since R^2 is an unreliable measure of fit in TSLS and 3SLS estimation, it is not reported here. Instruments in TSLS for the gender attitudes index are: importance of religion, frequency of religious participation, percentage of population for whom religion important or very important, dominant religion dummies, percentage of population that believes political leaders should be religious, and disagree that religious leaders should not influence government, and all remaining independent variables. Exogenous variables used as instruments in 3SLS include: all instruments from the TSLS regressions, and R&D and its square, M2 and its square, and life expectancy. All well-being variables measured such that higher values correlate with a higher status for women. The gender (attitudes) index is measured such that a higher value indicates more gender inequitable attitudes. Estimation is performed using STATA 11.0.

* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.001$.

to-male population ratios and educational attainment, improves but at a decreasing rate (the sign of the *per capita* GDP squared variable is negative). Life expectancy has a positive effect, significant only in the female/male population ratio regressions. The gender attitudes index has a negative effect on both measures of gender equality and in all cases the effect is statistically significant. The magnitude of the effect is smaller than on the GEI; a one-unit increase in the gender attitudes index induces a 3% and 5% decrease in the female/male population rate and female/male education ratio, respectively.

The effect of *per capita* GDP on female share of the labor force is not statistically significant. Life expectancy has a positive effect but it is not statistically significant in any of the regressions. Finally, the gender attitudes index has a negative and significant effect on female share of the labor force in all regressions, with a one-unit increase inducing a 10% decline in the female share of the labor force.

The number of countries with data on women's share of professional and technical jobs drops to 66 for the OLS regressions, and 53 and 39 for the TSLS and 3SLS regressions, respectively. *Per capita* GDP has a positive significant effect in the OLS and TSLS regressions, and its square has a negative significant effect. However, coefficients on those variables are not significant in the 3SLS regression. The gender attitudes index has a significant negative effect on women's share of professional and technical jobs. Again, measured at the mean and using the 3SLS results, a one-unit increase in the gender attitudes index results in a 13% decline in female share of professional and technical jobs.

The variable representing the percentage of births attended by skilled health personnel has not been previously explored in the cross-country gender well-being literature to our knowledge. This variable captures women's access to medical services. The result shows that the percentage of births attended by skilled health personnel rises with the level of development at a diminishing rate. The gender attitudes index coefficient is negative and significant in all regressions. The impact is sizeable. A one-unit increase in the gender attitudes index is associated with an 8% decline in percentage of births attended by skilled health personnel. This suggests that gender hierarchical attitudes induced by religiosity negatively impact social expenditures related to women's health.

The regression results on the determinants of the compensation level of maternity leave are particularly interesting. This policy variable measures the effective number of weeks of paid maternity leave, reflecting explicit government policy on support for women's dual role as parent and worker. The indicator captures a mechanism through which we might observe religious gender attitudes on state-level decision-making. Notably, neither *per capita* GDP nor its square is a statistically significant determinant of the number of weeks of paid maternity leave (although signs are in the expected direction). Life expectancy has an unexpected significant negative effect in the 3SLS regression. Gender attitudes have a significant negative effect on maternity leave compensation, with a one-unit increase in the index associated with a 17% decline in weeks of paid maternity leave.

To summarize, the empirical results provide overwhelming statistical evidence that the gender attitudes index has a negative and significant effect on all measures of gender equality in well-being. The results are robust across seven measures of gender equality in well-being and statistical techniques that take into account possible endogeneity of several explanatory variables.[17] The results imply that religiosity has an independent association (if not causality) with gender outcomes, via its effect on shaping gender norms and stereotypes. The transmission of this effect is not determined by the country's level of development.

5. CONCLUSION

Two questions about the persistence of gender inequality continue to reverberate. Why do societies persistently invest less in female well-being than male? And why, even when women reach adult life with equal abilities, do they fare so poorly in labor markets, in political representation, and in gaining access to positions where they have a seat at the table as decision-makers?

This paper seeks to shed light on those questions by investigating the impact of religiosity on attitudes toward gender equality. We find that religiosity is indeed strongly linked to gender inequitable beliefs. Not only religion matters, of course. The gender gap in attitudes is wide, with men showing evidence of holding more inequitable gender attitudes than women. Perhaps more heartening in terms of the potential for public policy to promote greater equality, we also found that individuals with higher levels of education and income showed evidence of holding more gender equitable views. This evidence implies that apart from its intrinsic value and role in stimulating growth, broad-based education is tied to social and institutional change on the macro level.

We find overwhelming statistical evidence that the effect of religiosity extends beyond attitudes to negatively impact several measures of gendered well-being outcomes, even after controlling for *per capita* GDP and level of development. We also found that higher-income countries perform better on some measures of gender equality, such as female-to-male population ratios, education ratios, female share of professional and technical jobs, and skilled health personnel attending births. But for several indicators—women's share of the labor force, maternity leave compensation, and the Social Watch's Gender Equality Index—higher *per capita* GDP does not give robust evidence of ameliorating women's status, suggesting that more interventionist policies may be required.

In this study, no one religion stands out as consistently more gender inequitable in its effects than all the others. This contrasts with several macro-level studies that have examined the role of religion with a focus on Islam (Baliamoune-Lutz, 2007; Dollar, 1999; Forsythe & Korzeniewicz, 2000). The empirical evidence presented here implies that dominant religions—and not exclusively Islam—have varying effects on gender attitudes and outcomes, some positive, some negative. The emphasis in previous research placed on any one religion, therefore, seems misplaced—or at least, is not fully illuminating with regard to the effect on gender attitudes and outcomes. Of greater significance, however, is the finding that once we control for the individual's religion, we find that religiosity itself—the intensity of religious belief and the frequency of religious participation—is consistently negatively correlated with gender attitudes and outcomes.

We may infer from these results that religiosity contributes to and perpetuates hierarchical gender ideology, norms, and stereotypes. Gender norms are difficult to change. Progressively advancing the participation of women in decision-making roles and in labor market participation, however, can hasten positive change. There is some evidence that increases in women's share of employment promote gender equitable norms and stereotypes (Seguino, 2007a). Similarly, evidence from India shows that political affirmative action can reduce gender bias in attitudes (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2008). This suggests that greater efforts to increase women's paid employment—through such policies as paid parental leave, subsidized child care, and affirmative action in employment—could serve as a fulcrum for gender equitable change, along with reservation policies (quotas) on political lists to increase political participation.

There are other potential countervailing forces to those social institutions that would hinder advancement of the goal of gender equality. Academic research identifying the beneficial impact of gender equality and women's organizations that advocate for gender sensitivity in public sector spending, for example, can play a role in shaping government policies and resource distribution.

It does not appear, however, from this analysis, that religious institutions as currently structured provide a pathway for amelioration of women's unequal status. Even if in hard times, religious organizations offer women solace and some material support, the net effect on women's well-being would appear to be negative, based on the empirical results presented in this paper. These results suggest the wisdom of scrutinizing the impact on gender equality of aid funneled through religious organizations. Donors may find that religious non-governmental organizations have a weaker record in improving women's relative well-being than non-religious organizations.

That said, religious institutions themselves are susceptible to change, albeit slow, and internal groups show evidence of advocating for progressive change. Examples abound. At a recent conference in Kuala Lumpur, Muslim women, frustrated with the patriarchal interpretation of Islamic text, met to come up with ways to demand equal rights for women (Tavernise, 2009). In the United States, Catholics for Choice and Catholics for Gay Marriage are activist groups working to change church norms and rules on homosexuality, abortion, and contraception. Formal religious institutions offer an organizational framework within which women's groups can operate, and this may lead to more rapid change than could have been imagined decades ago when gender outcomes were more unequal and global communication more limited.

NOTES

1. The term patriarchy refers to a gender hierarchical system, recognizing, however, that patriarchy takes many different forms across countries and over time.

2. The number of countries covered in each survey ranges from 20 in the first wave, to a maximum of 67 in the fourth wave, and only 54 in the fifth wave. http://www.wvs.org accessed February 4, 2009.

3. An exploratory factor analysis of the gender attitude variables was conducted to assess the structure of the data. While we expected to find two underlying latent factors related to gender equality of attitudes, the data revealed only one latent factor. This suggests that the grouping of the questions discussed above is illustrative but that these two groups do not differentially describe gender inequality of attitudes. A second purpose of the analysis was to determine whether any of the attitude questions is redundant and could, therefore, be eliminated. Only one of the gender attitude questions had a factor loading substantially below the threshold of 0.30. That question, *A working mother can establish as warm secure a relationship with children as a mother who does not work,* was retained, however, since including it does not reduce the sample size. It is routinely asked across countries and waves. Factor loadings were greatest for the two questions, *Can abortion (divorce) be justified always, never be justified, or something in between?*

4. Although the ordered categorical dependent variables in our analysis suggest the appropriateness of ordered probit regressions, we report fixed effects estimates from OLS because of greater ease in interpreting the coefficients and to permit comparison of results with previous studies on this topic (such as Guiso *et al.*, 2003). The direction and significance of the coefficients obtained from ordered probit regressions are similar to those from OLS.

5. Even though we control for numerous individual characteristics, our results may be driven by unobserved differences not accounted for by the included independent variables. There may, for example, be a latent variable that not only influences attitudes but also causes a person to be more or less religious. Guiso *et al.* (2003) explored this possibility by including the response to the question *Were you brought up religiously at home?* as an independent variable to identify that portion of attitudes due to religion, independent of individual characteristics. We did not follow this approach because the question was asked in only one of the five WVS waves, greatly reducing the sample size. It is, however, useful to note that the sign and significance of the coefficients on the religiosity variables in Table 2 are similar to the results presented in Guiso *et al.* (2003), reducing concern that our results are driven by the omission of a latent variable.

6. Several coding changes have been made to the data for this study. Sunni, Shia and Qadriani have been recoded as Muslim; Taoism as Buddhist; Greek Catholic and Catholic (does not follow rules) recoded as Catholic along with Roman Catholics; Anglican, Lutheran, Mennonite, Methodist, Presbyterian, Free Church, and Church of Sweden as Protestant; and Armenian Apostolic as Orthodox. Evangelical Christians are classified as "other" due to insufficient data that would allow us to identify them as Catholic or Protestant. A number of other religions that may be offshoots of major religions are included in the category "other" as well. This category is far from homogenous, however, and includes a wide variety of religious attitudes towards gender relations. For example, one of the minor religions in this category is Wicca, a religious group in which women are held in high esteem.

7. This model controls for country-level factors that influence attitudes, thereby removing the possibility that the remaining effects of the independent variables are due to the changes in the country sample in each wave. Nevertheless, in a separate set of regressions (not reported here), we limited the sample to the 29 countries for which data for Waves 2–4 were available to produce a balanced sample. Results were broadly similar to those reported in Table 2.

8. Another possible explanation for the small effect of religious participation is that the two religiosity questions are closely related, such that the question on importance of religion is really capturing some of the effect of religious participation. To test this, regressions were rerun, omitting the question on importance of religion. The size of the effect of religious participation increases but by a small amount, consistent with the argument that the effect of religious participation is quite modest.

9. Based on data from all waves of the WVS, 62% of men say religion is important or very important in their lives while 71% of women so identify.

10. Thus, in cases where women are accorded say, 6 weeks at half pay, the effective compensation at full pay is measured as 3 weeks.

11. For technical details on the construction of the index and data sources, see http://www.socialwatch.org/en/avancesyRetrocesos/IEG_2008/tablas/technicalNotes.html.

12. We experimented with two additional formulations of the gender index: one comprised only of country average responses to Question 10 and a second constructed from a weighted average of responses to Questions 5, 7, and 10. Results proved to be robust to alternative specifications. In all cases, the gender attitudes indices exerted a statistically significant negative effect on the seven measures of gender equality in well-being.

13. Regressions were also run with three additional variables in place of life expectancy to capture social expenditures: death rates per 1,000 people, the percentage of the population with access to safe drinking water, and hospital beds per 1,000 people. Results for the variables of interest were very similar to those obtained with the life expectancy variable.

14. Tests confirm the validity of the instruments. The R^2 obtained by regressing the gender attitudes index on the instruments was 0.798 and an F-value on the sum of the coefficients in the first stage regression of 18.29 suggesting these variables are good indicators for the gender attitudes index.

15. The economic growth literature identifies a variety of possible instruments related to trade and market liberalization such as imports and exports as a percentage of GDP, the black market premium, property rights, rule of law, and business investment. The weakness of these instruments is the contradictory evidence on the benefits of economic openness and market liberalization for economic growth. Moreover, while investment may be a stimulus to growth, it is a component of GDP. It is not particularly meaningful to regress a trending variable on one of its subcomponents.

16. VIF tests for multicollinearity showed scores exceeding 10 for GDP and GDP squared, for R&D and its square, and for $M2$ and its square. In the GEI regression, dropping GDP squared resulted in a negative and significant coefficient on GDP. The only other variable that suffers from multicollinearity is religious beliefs, and not surprisingly, it was found to be statistically insignificant in a number of the 3SLS regressions (Table A.2.).

17. Some studies link the degree of religiosity (inversely) to the level of development (for example, Inglehart & Norris, 2003) and, and in turn, religiosity has been argued to influence the level of development (see Guiso et al., 2003). To address this, we ran another set of 3SLS regressions with religiosity measures included as explanatory variables in the GDP regression and GDP an explanatory variable in a fourth equation estimating the determinants of religiosity (in addition to equations for gender well-being equality, GDP, and the gender attitudes index), controlling for variations in the degree of economic insecurity—infant mortality, death rates, immunization rates, and access to clean water. The gender attitudes index coefficients continued to be negative and statistically significant at the 1% level with the exception of the percentage of births attended by skilled health personnel. We ran one final set of regressions, controlling for a summary measure of gender institutions from the Jütting, Dayton-Johnson, Dreschler, and Morrisson (2008) Gender, Institutions, and Development (GID) database. Those authors provide evidence that an index of gender practices has a negative effect on gender equality in outcomes. In our regressions, the GID variable was negative and significant while the gender attitudes index retained its sign and significance in most regressions (results available on request).

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APPENDIX

See Tables A.1 and A.2.

Table A.1. *WVS country sample*

Albania (3, 4)
Algeria (4)
Andorra (5)
Argentina (2, 3, 4, 5)
Armenia (3)
Australia (3, 5)
Austria (2, 4)
Azerbaijan (3)
Bangladesh (3, 4)
Belarus (3, 4)
Belgium (1, 2, 4)
Bosnia and Herzegovina (3, 4)
Brazil (2, 3, 5)
Bulgaria (2, 3, 4, 5)
Burkina Faso (5)
Canada (1, 2, 4, 5)
Chile (2, 3, 4, 5)
China (2, 3, 4, 5)
Colombia (3, 5)
Croatia (3, 4)
Cyprus (5)
Czech Republic (2, 3, 4)
Denmark (1, 2, 4)
Dominican Republic (3)
Egypt (4, 5)
El Salvador (3)
Estonia (2, 3, 4)
Ethiopia (4, 5)
Finland (2, 3, 5)
France (1, 2, 5)
Georgia (3, 5)
Germany (1, 2, 3, 5)
Ghana (5)
Greece (4)
Hong Kong (5)
Hungary (2, 3, 4)
Iceland (1, 2, 4)
India (2, 3, 4, 5)
Indonesia (4, 5)
Iran (4, 5)
Iraq (5)
Ireland (1, 2, 4)
Israel (4)
Italy (1, 2, 4, 5)
Japan (2, 3, 4, 5)
Jordan (4, 5)
Korea, Republic of (All)
Kyrgyzstan (4)
Latvia (2, 3, 4)
Lithuania (2, 3, 4)
Luxembourg (4)
Macedonia (3, 4)
Malaysia (5)
Mali (5)
Malta (1, 2, 4)
Mexico (3, 4, 5)
Moldova (3, 5)
Morocco (4, 5)
Netherlands (1, 2, 4, 5)
New Zealand (3, 5)
Nigeria (2, 3, 4)
Norway (2, 3, 5)
Pakistan (3, 4)
Peru (3, 4, 5)
Philippines (3, 4)
Poland (2, 3, 4, 5)
Portugal (2, 3, 4)
Romania (2, 4, 5)
Russian Federation (3, 4, 5)
Rwanda (5)
Saudi Arabia (4, 5)
Serbia (3, 4, 5)
Singapore (4)
Slovakia (2, 3, 4)
Slovenia (2, 3, 4, 5)
South Africa (2, 3, 4, 5)
Spain (All)
Sweden (2, 3, 4, 5)
Switzerland (2, 3, 5)
Taiwan, Province of China (3, 5)
Tanzania (4)
Thailand (5)
Trinidad and Tobago (5)
Turkey (2, 3, 4, 5)
Uganda (4)
Ukraine (3, 4, 5)
United Kingdom (All)
United States of America (All)
Uruguay (3, 5)
Venezuela (3, 4)
Viet Nam (4, 5)
Zambia (5)
Zimbabwe (4)

Note: Waves for which data are available are in the parentheses.

Table A.2. *Influence of religiosity on gender well-being outcomes: full results of 3SLS regressions*

Dependent variables	Independent variable	Gender Equality Index	F/M population ratio	Ratio F/M primary and secondary education	Female share labor force	Female share professional and technical positions	Births attended by skilled health personnel (%)	Maternity leave compensation
Gender well-being	GDP	9.763	40.034	33.946	−10.011	36.542	71.652	26.334
		(19.66)	(15.10)***	(19.76)*	(15.20)	(29.04)	(44.62)	(29.25)
	GDP^2	−2.008	−6.592	−5.299	0.415	−6.639	−8.689	−4.069
		(2.86)	(2.19)***	(2.84)*	(2.21)	(4.23)	(6.54)	(4.18)
	Life expectancy	−3.259	8.412	0.817	0.608	−0.376	−17.138	14.720
		(4.79)	(3.69)**	(4.80)	(3.71)	(7.27)	(11.55)	(6.91)**
	Gender attitudes index	−6.533	−3.102	−4.601	−4.899	−6.328	−7.432	−2.141
		(0.98)***	(0.75)***	(0.96)***	(0.75)***	(1.64)***	(2.52)***	(1.28)*
	Constant	141.563	43.663	96.536	120.892	77.148	100.128	57.059
		(40.12)***	(30.82)***	(40.15)**	(31.03)***	(60.54)	(99.31)	(56.97)
	Number of obs.	43	43	42	43	39	38	33
	χ^2	70.53	22.48	31.52	52.05	15.96	41.71	9.65
GDP	R&D	0.762	0.818	0.884	0.884	0.833	0.585	0.889
		(0.23)***	(0.23)***	(0.22)***	(0.25)***	(0.22)***	(0.31)*	(0.23)***
	$R\&D^2$	−0.1222	−0.132	−0.151	−0.147	−0.139	−0.035	−0.150
		(0.07)*	(0.07)**	(0.06)**	(0.07)**	(0.06)**	(0.11)	(0.05)**
	M2	0.011	0.009	0.007	0.007	0.011	0.008	0.006
		(0.004)*	(0.005)**	(0.004)*	(0.005)	(0.005)**	(0.005)*	(0.005)**
	$M2^2$	−0.00003	−0.00003	−0.00002	−0.0003	−0.00005	−0.00003	−0.00002
		(0.00003)	(0.00002)	(0.00002)	(0.00002)	(0.00002)**	(0.00002)	(0.00002)
	FSH	−0.013	−0.018	−0.016	−0.024	−0.029	−0.017	−0.023
		(0.01)	(0.01)*	(0.01)*	(0.01)*	(0.01)***	(0.01)	(0.01)**
	F/M enrollment ratio	0.049	0.048	0.048	0.050	0.049	0.053	0.053
		(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.02)***	(0.01)***	(0.01)***
	Constant	−1.758	−1.322	−1.411	−1.294	−0.997	−1.767	−1.641
		(1.19)	(1.19)	(1.11)	(1.21)	(01.32)	(1.24)	(1.13)
	Number of obs.	43	43	43	43	39	38	33
	χ^2	91.51	90.01	103.57	89.84	101.55	63.13	89.91
Gender attitudes index	Religion important	0.004	0.011	0.005	0.007	0.007	−0.004	0.006
		(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	Religious participation	0.028	0.026	0.038	0.025	0.026	0.034	0.031
		(0.01)***	(0.01)***	(0.01)**	(0.01)***	(0.01)***	(0.01)***	(0.01)***
	Religious politicians	0.017	0.015	0.042	0.017	0.016	0.024	0.013
		(0.01)**	(0.01)*	(0.01)***	(0.01)**	(0.008)*	(0.01)***	(0.01)
	Religious government	−0.014	−0.021	0.021	−0.018	−0.012	−0.019	−0.022
		(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
	Constant	9.256	9.075	10.599	9.143	9.127	9.362	11.393
		(0.42)***	(0.43)***	(0.63)***	(0.42)***	(0.43)***	(0.43)***	(0.61)***
	Number of obs.	43	43	43	43	39	38	33
	χ^2	252.71	250.79	250.32	251.91	205.36	153.66	256.39

Note: Coefficients on dominant religion dummies are not reported here.

*$p < 0.10$.

**$p < 0.05$.

***$p < 0.01$.