



EDWRG Working Paper Series
March 2022

**ECONOMIC DEVELOPMENT
AND WELL-BEING
RESEARCH GROUP**

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PERCEIVED HUMAN CAPITAL INVESTMENT IN AFRICA**

Working Paper Number 08-22

Mduduzi Biyase and Beatrice D. Simo-Kengne

Cite this paper: Biyase, M., & Simo-Kengne, B.D. (2022). The Impact Of Religion/Spirituality On Offspring's Perceived Human Capital Investment In Africa. *EDWRG Working Paper Number 01-22*.

THE IMPACT OF RELIGION/SPIRITUALITY ON OFFSPRING'S PERCEIVED HUMAN CAPITAL INVESTMENT IN AFRICA

Mduduzi Biyase

School of Economics, University of Johannesburg

Email: mbiyase@uj.ac.za

and

Beatrice D. Simo-Kengne

School of Economics, University of Johannesburg

Email: bdsimo-kengne@uj.ac.za

Abstract

This paper examines the association between religiosity and individuals' perception of offspring education across spiritual denominations in selected African countries using the Words Values Surveys from the 1980s, 1990s, 2000s and 2010s waves. Empirical results from clustered OLS indicate that individual's perception of offspring education correlate significantly with both religiosity involvement, "being active member of a religious group" or "Orthodox beliefs" and religious affiliation. Controlling for religion reveals that religious denominations do not share the same attitudes toward education of boys and girls with Protestants, Catholics, Jew +Buddhist+ Hindu and traditional religion being more progressive compared to Muslims and non-religious individuals. These findings suggest that indeed religion is not detrimental to education; however, some aspects of education might be inconsistent with religious faith, irrespective of the denomination. In religion driven context like Africa, education system should be inclusive of general cultural norms including religious values.

Keywords. Religious affiliation, religious involvement, psychology, education, investment

1. Introduction

The human capital literature emphasizes the role of education in driving productivity and efficiency of workers through increasing cognitive capital that results from both innate abilities and investment in human beings. Accordingly, many developing countries have embarked on education promoting policies including free education, increased share of government expenditures to education, gender equity in education, etc. Despite these efforts to improve human capital investment, education remains a critical development challenge in Africa, the root of which could be traced from religious traditions. Although religious organisations have progressively lost their pre-nineteenth century position of major or sole education providers, religious traditions continue to shape educational systems, norms and practices (Feldmann, 2019). Given the dual characteristics of Africa as extremely religious and less developed, it is imperative to understand the relationship between religion and human capital investment in these countries.

According to Inglehart and Baker (2000), contemporary values and beliefs in given societies are influenced by the historical heritage of traditional religions, which partly channel through educational institutions. Feldmann (2019) document several reasons substantiating the persistent religious influence. The first reason is the substitution between identity and religious affiliation where people continue to identify themselves with a religious denomination. In the sample of African countries understudy, about 90% of population are affiliated with a religious denomination based on the World Values Surveys data. Therefore, individuals' perception of education depends on the relative importance their respective religious denomination attaches to the investment in human beings. The second motivation derives from the influence that religious authorities exercise on government and decision makers' policies including educational schemes. Expectedly, people's perception of gender inequality in education is likely to be shaped by the religious norms on gender equity across different denominations.

The dynamics of educational provision have extensively been studied in the literature with some appealing conclusions that education systems continue to evolve due to pedagogical factors led by teachers' union (Bascia and Osmond, 2013) as well as social, cultural, historical, technological, geographical, political and economic influences (Talatovna and Bahodirjanovich, 2020). Generally, religion as a driving engine of the education system tends to be overshadowed by other

sociocultural factors although religion is likely to play a key in education investment decision, particularly in religious continent like Africa.

Against this background, the present study hypothesises and tests the association between religiosity and individual's perception of offspring education in Africa. It seeks to investigate whether education level and education perception vary across major religious denomination and which denomination is more favourable to quality, primary and gender equitable education investment. To this end, the empirical strategy implements a pooled OLS with clustered standard error on different waves of the World Values Surveys data available for 13 African countries. The rest of the paper is organised as follows. The next section lays the theoretical framework built from existing literature, section 3 describes the methodology and data, section 4 discusses the empirical findings and the last section concludes.

2. Investment decision making under religious faith

Two fundamental groups of theories exist that explain the decision-making process. The normative approach to decision-making that supports rational decisions and the behavioural decision approach that focuses on understanding how people make decision (Takemura, 2021). Rather than being rational, the decision to invest in human beings can be explained by the behavioural decision theory, which provides the psychological description of human judgment, and behaviour that can apply to religion. This framework combines behavioural economics and behavioural finance to explain decision-making processes under certainty, risk and uncertainty including ambiguity and ignorance. Accordingly, people decisions are thought to be influenced by their emotive and cognitive preconceptions.

The cognitive foundation of religious beliefs overlaid by Willard, Cingl and Norenzayan (2020) identifies three psychological roots of religious faith: the man-body dualism; the teleology and the anthropomorphism explained by Atran and Norenzayan (2004), Barrett (2007) and Boyer (2001). While the man-body dualism tends to view the mind as a separate from the body, the teleology associates to phenomena the artifacts designed to specific purposes. Finally, the anthropomorphism considers nonhuman objects and beings as possessing humanlike features such as conscience, emotions and memory. How do these cognitive preconceptions work together to influence decision-making in general and human capital investment in particular?

Preconceptions produce the inclination for or against something or someone. Arguably, people with religious affiliation tend to be overconfident in making judgment because of faith. While overconfidence may result in illogical decisions possibly due to over estimation of own's belief, judgment and abilities, it is not always a depraved occurrence (Gill, Khurshid, Mahmood and Ali, 2018). In religion, overconfidence is likely to lead different investment judgements in human capital across religious denominations. For many religious denominations rooted on "Holy Scriptures", education is important to learn the religious principles and practices and ultimately to ensure the intergenerational transmission of faith. However, education is an investment, which requires capital. Because religious beliefs offer its affiliates the ability to cope with unsatisfied needs, religious people who lack the capital to invest in education tend to worry less or not worry at all. Similar to the teleology preconception, this natural circumstance could be understood as serving a specific purpose. From a different perspective, education like any other investment bears some kind of risk. In religion, education risk can be associated to the mismatch between the scientific logic learned from school and the illogical behaviour prompted by religious faith. Higher level of education is also risky for religious believers because of the gender equity policies, which are not aligned with many religious values. Therefore, the following question: Could religion be one of the underlying causes of human capital underdevelopment in Africa? This study seeks to analyse the relationship between education attainment/perception and religious affiliation/involvement as sketched in the theoretical framework in Figure 1.

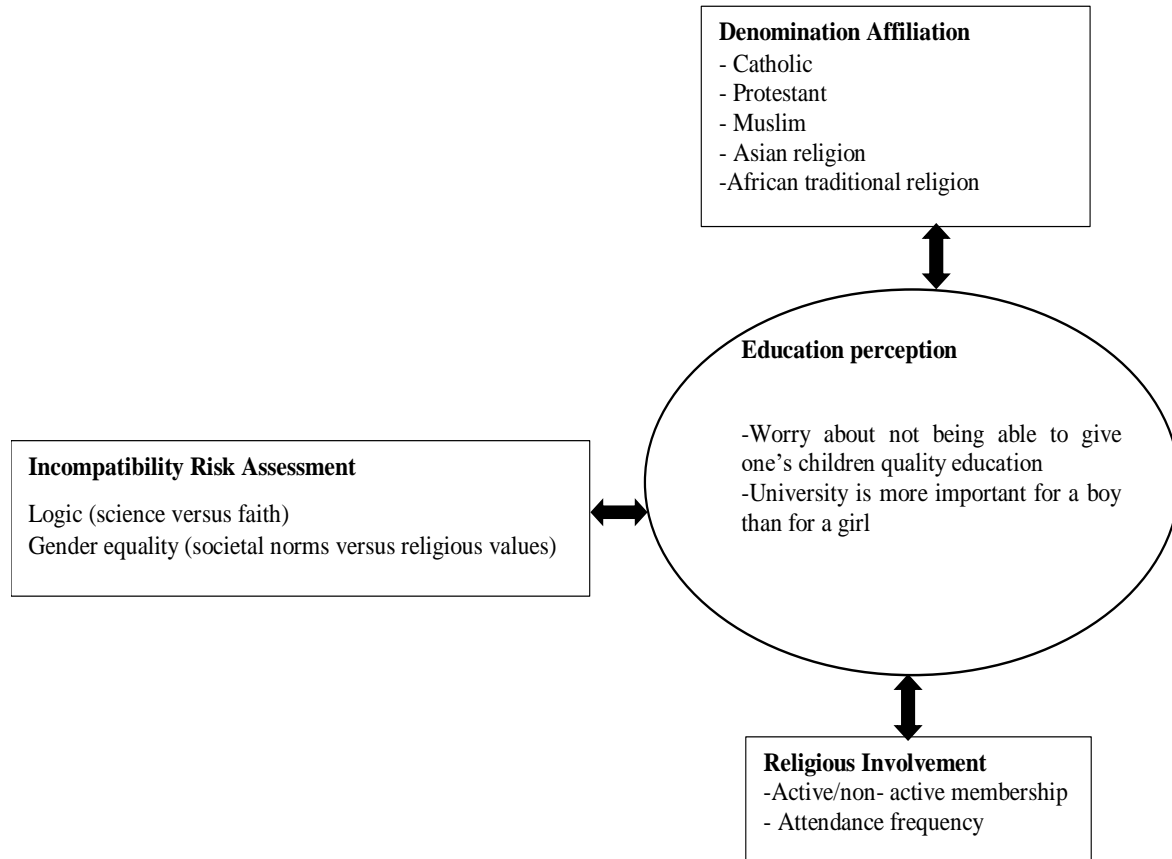


Figure 1. Human capital investment decision under religious beliefs

A religious individual makes education investment decision based on his spiritual capital and the perceived risk. The spiritual capital is determined by the affiliation to a specific denomination as well as the involvement in religious activities. In terms of the risk, it is usually the case that societal norms contrast religious ethics and values. This is applicable to education where scientific logic thought at school does not always conform to religious faith mostly alluded to as illogic. Likewise, gender equality advocated in modern education diverges from spiritual beliefs that preach gender complementarity; hence see gender equality differently. Education is also expected to influence religion. Since modern education is rooted on capitalism, individuals adhering to capitalism principles tend to be egoistic and thus are likely to refrain from religious commitment built on socialism that rather advocates sharing. Accordingly, the spiritual capital is possible to deteriorate as education attainment increases. Similarly, logical thinking ability improves with the level of

education to the detriment of faith reasoning skill. The theoretical interplay between religion and education raises various lines of empirical assessment; three of which will be the focus of the present investigation.

The relationship between religion and education attainment is not only inconclusive but also context driven. This is consistent with a systematic review on religion and higher education conducted by Mayrl and Oeur (2009) who attributed the mixed findings on academic performance impact of religion to methodological flaws resulting from weakness of some religious measurements and small sample size with associated lack of generalisability (Walker and Dixon , 2002; Zern, 1989). In addition, they emphasize that positive impact of religion on academic success are quite common in the literature (Regnerus, 2000; Smith and Denton, 2005 among others) relative to the evidence on the negative education effect of religion (Darnell and Sherkat, 1997; Sax et al., 2002 among others). Byfield (2008) finds that believing in God engineers United Kingdom and United States' Black boys with religious capital, which boost their education achievement. While most of the empirical evidence focus on Christianity, Feldmann (2019) draw the evidence from the world data comprising 150 countries that male primary enrolment rate increases with the affiliation to Catholicism and Protestantism, Hinduism and Buddhism affiliates are favourable to girl primary enrolment while Muslim is not favourable to primary enrolment for both genders. However, empirical evidence exist that confirm the feedback effect of education attainment on religious involvement (See for example Sacerdote and Glaeser (2001) and the references therein).

The link between religiosity and subjective education has received limited attention in the empirical literature. Beyond one's education, religious involvement is expected to affect offspring schooling. Considering the intergenerational effect of religion, this study conjectures that parents religious preconceptions may stimulate or not the decision to invest in their offspring's human capital. Correspondingly, religious faith may prompt parents to have gender-differentiated perceptions of offspring education.

3. Data and Method

3.1. Data

The empirical investigation uses the 1980s, 1990s, 2000s and 2010s waves of the World Valued Surveys for thirteen African countries (such as Algeria, Burkina Faso, Egypt, Ethiopia, Ghana, Mali, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe) selected based on

data availability. Two education perception indicators are used: “Worries of not being able to give one's children a good education” and “University is more important for a boy than for a girl”. A binary variable was generated for each of them where 1 is favourable to the statement and 0 otherwise. We included control variables that are deemed important in explaining attitude towards the education of boys and girls. Specifically, we controlled for the following variables in our empirical model: age (in years); *Gender* (1= female or 0 otherwise); *Marital status* (1) Married, (2) Living together as married, (3) Divorced, (4) Separated, (5) Widowed, (6) Single/Never married. We created dummy variable for marital status where 1= Married, and 0= Otherwise. Self-reported health status was also included in the list of explanatory variables (1 = ‘very poor’, 2 = ‘poor’, 3 = ‘fair’, 4 = ‘good’ and 5 = ‘very good’). A categorical variable was constructed equal to 1 if the response is “very good or good” (Health1); equal to 2 if the response “fair” (Health2) and equal to 3 if the response is “very poor or poor” (Health3). We also included *Political party appeals, income distribution and country controls*. Our *Political party appeals* was constructed using the question: “In political matters, people talk of "the left" (Politicalleft) and "the right" (Politicalright) How would you place your views on this scale, generally speaking?” (10-points scale from 1=left to 10=right). *Income distribution* was measured using a question: “on this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in”. We generated three ordinal variables: scale of incomes equal to 1 for the lowest income group--1st to 3rd scale (Income1); equal to 2 for the middle-income group--4th to 6th scale (Income2) and equal to 3 the highest income group in the country--7th to 10th scale (Income3). WVS also contains a set of questions about trust. We use a variable derived from a question on trust: “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” (1= most people can be trusted 2= Need to be very careful). A measure of religious denomination affiliation was also included. The WVS asked, “Do you belong to a religion or religious denomination? If yes, which one?” (No or do not belong to a denomination= 0, Roman Catholic=1, Protestant= 2, Orthodox such as Russian/Greek/etc.= 3, Jew =4, Muslim =5, Hindu= 6, Buddhist= 7). In addition, a measure of religiosity involvement was also incorporated where respondents were asked if they are an active member, an inactive member or not a member of that type of various organizations, including church. Religiosity involvement was also measured using

attendance at religious services. The WVS asked “Apart from weddings and funerals, about how often do you attend religious services these days?” This variable was coded into a binary variable: 1=those attending weekly and 0 for the rest of the other options.

3.2. Descriptive analysis

In general, fewer respondents have no worries about the quality of their children education (Table 1). South Africa with the lower share of Muslims records the highest percentage of people who have no worries about not being able to give one’s children a good education (31.18%). This figure is close to the North Africa statistics, namely Algeria and Egypt that are mostly represented by Muslims. Whereas, Ethiopia and Rwanda and Ghana with a relatively higher percentage of Muslims rank high in respective order in the share of the sample respondents who have worries about not being able to give one’s children a good education (above 90%). Regarding primary education, more respondents think that increase primary education is important.

Table 1. *Cross-country education perception across religious denomination*

	Worries of not being able to give one's children a good education		University is more important for a boy than for a girl		Increase primary education	
	No worries	Worries	No	Yes	Low priority	Important
Algeria	24.43	75.57	66.69	33.31	---	---
Burkina Faso	---	---	65.25	34.75	2.49	97.51
Egypt	18.04	81.96	65.44	34.56	---	---
Ethiopia	6.69	93.31	88.27	11.73	0	100
Ghana	7.59	92.41	75.22	24.78	---	---
Mali	---	---	50.41	49.59	2.44	97.56
Nigeria	14.36	85.64	59.16	40.84	---	---
Rwanda	6.89	93.11	67.12	32.88	0.28	99.72
South Africa	31.18	68.82	76.08	23.92	2.01	97.99
Tanzania	---	---	84.39	15.61	---	---
Uganda	---	---	76.51	23.49	---	---
Zambia	---	---	75.69	24.31	4.56	95.44
Zimbabwe	12.27	87.73	84.17	15.83	---	---

Note. The figures displayed are frequencies of education perception variables across countries. The first variable (Not being able to give one’s children a good education) initially had four categories that have been grouped into two: “Not much” and “Not at all” worries form “No worries” category and “Very much” and “A great deal” of worries form “worries” categories. Similarly, the variable (University is more important for boy than girl) is recoded by grouping “Agree strongly” and “Agree” into the “Yes” category and “Disagree” and “Strongly disagree” into the “No” category. Finally, three initial categories (“Top priority”, “High priority” and “Medium priority”) of the variable –increase primary education- have been grouped to form “important” category against the low priority category. These variables are available for 8, 13 and 6 African countries, respectively.

Table 2. *Religious denomination representation in the sample data*

Roman Catholic	Protestant	Orthodox	Muslim	Jew	Buddhist	Hindu	Other Christian	Other
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Algeria 2 waves 1999-2004 2010-2014	0	0	0	99.76	0	0	0	0.24	0
Burkina Faso 1 wave 2005-2009	31.18	7.91	0.20	53.92	0.13	0	0.07	0	5.54
Egypt 3 waves 1999-2004 2005-2009 2017-2020	0	0	0	94.47	0	0	0	5.52	0.01
Ethiopia 2 waves 2005-2009 2017-2020	0.92	18.81	57.45	21.28	0.22	0.04	0	0	0.92
Ghana 2 waves 2005-2009 2010-2014	17.43	56.55	6.60	13.69	0.03	0.03	0.03	0	3.28
Mali 1 wave 2005-2009	1.80	0.53	0.07	94.88	0.73	0.07	0.53	0	1.06
Nigeria 5 waves 1989-1993 1994-1998 1999-2004 2010-2014 2017-2020	15.84	18.29	3.36	33.00	0.34	0.01	0.06	22.92	2.61
Rwanda 2 waves 2005-2009 2010-2014	54.02	24.82	1.05	10.05	0.10	0.16	0.03	0	3.13
South Africa 6 waves 1981-1984 1989-1993 1994-1998 1999-2004 2005-2009 2010-2014	12.25	39.76	0.71	5.83	0.61	0.20	3.72	6.99	16.62
Tanzania 1 wave 1999-2004	28.40	18.85	4.99	40.36	3.61	0	0.09	0	1.98
Uganda 1 wave 1999-2004	36.56	43.06	0.40	16.98	0	0	0.10	1.10	0.70
Zambia 1 wave 2005-2009	34.20	46.27	0.13	1.33	0.07	0.13	0.27		12.13
Zimbabwe 3 waves 1999-2004 2010-2014 2017-2020	33.70	37.66	0.67	4.98	1.51	0.03	0.03	3.80	7.21

Note. The table displays the average percentage of respondents belonging to specific religious denomination.

However, in half of the sample countries, a substantial percentage of respondents ranging between 32 and 49.59 think that university is more important for a boy than for a girl. This is particularly the case in Algeria, Burkina Faso, Egypt, Mali, Nigeria and Rwanda; all of which have relatively

high share of Muslims with the exception of Rwanda. Perceived gender bias in tertiary education is less prominent in Christian dominated countries including Ethiopia, Ghana, South Africa, Uganda, Tanzania, Zambia and Zimbabwe with at least 75% of the respondents disagreeing that university is more important for a boy than for a girl.

The summary statistics (see Table 2) indicate that Muslims form at least 95% of the sample population in North African countries (Algeria and Egypt) as well as in Mali, followed by Burkina Faso with about 54% of Muslims. Tanzania and Nigeria also record high percentages of Muslims with an average of 40.36% and 33% of the sample population, respectively. Conversely, Sub-Saharan Africa countries are generally represented by Christians be it Roman Catholic, Protestant, Orthodox and/or other Christian. While Jew, Hindu, Buddhist are marginally represented in Africa, there is a modest share of the population in Sub-Saharan Africa that belong to unnamed religious denomination; ranging from about 1% to 17%. This could form the third main religion in Africa known as African traditional religion (Manigault et al., 2017)

3.3. Estimation approach

Following the existing literature, this study has employed the clustered ordinary least squares (OLS) in the empirical investigation of the relationship between religiosity and education perception. Various indicators of religiosity are considered under the assumption that their education effect might vary across different denomination groups. Specifically, three indicators of religiosity are used, namely orthodox beliefs, church services attendance and church membership besides the religious identity of the respondents including Protestants, Catholics, Jew/Buddhist/Hindu and traditional religion. The study adopts a sequential estimation approach where five model specifications are considered. Models 1 to 3 study each of the three religiosity indicator individually while Model 4 focuses solely on the religious identity of the respondents. Model 5 is inclusive of all religiosity indicators and the religious identity simultaneously, thus unearthing the relative influence on the respondents 'attitude towards their offspring education. Each of the five models accounts for a set of control variables comprised of the socio demographic and economic characteristics of the respondents.

The models used in the empirical investigation consider Y_i as the attitude of the respondent i toward offspring education, which only takes values of one or zero (binary indicator), Rel_i as $(1Xd_1)$ the vector of the religiosity and Rel_i as $(1Xd_2)$ as the vector of exogenous variables.

Let $G := \Phi\{Y_i, Rel_i, X_i\}$ be the transformation function and assume that Y_i follows a Bernoulli distribution with probability P_i , conditional on the transformation function G . The purpose of the empirical analysis is to estimate the following marginal model:

$$Y_i^* = \alpha + \beta Rel_i + \Phi X_i + \varepsilon_i \quad (1)$$

where X contains all the control variables that are known to influence attitudes age, gender, marital status, health status, income distribution, trust and political strata. ε represents the error term. Rel represent the one or the set of religiosity indicators. Y_i^* is a latent variable related to the conditional probability P_i , through the popular cumulative distribution function of the random variable $\{u_i\}$ assumed to be an i.i.d. process.

$Y_i^* := G^{-1}\{P_i\}$, with $G(\cdot)$ a cumulated distribution function that is continuous, twice differentiable and monotonically increasing.

$$E(Y_i|G) = P(Y_i^* \geq \varepsilon_i|G) = G(Y_i^*) = P_i \quad (2)$$

In the literature, G has either a linear or a nonlinear functional form. Assuming a linear functional form leads to the linear probability model where $Y_i^* = Y_i$ which can be estimated using OLS. Assuming a nonlinear functional form on the other leads to the violation of the OLS assumption, requiring an alternative estimation technique such as maximum likelihood. The common nonlinear function form used in the empirical studies is either logistic function (logit model) or normal distribution function (probit model).

For the sake of robustness, the study considers both linear and nonlinear transformation functions. The linear transformation function based model is estimated using clustered standard errors option, which helps control for heteroscedasticity whereas the nonlinear alternative relies on the probit specification.

4. Results and discussion

4.1. Religious perception about children education

Models (1)-(5) of Table 3 display the estimates for the effects of religiosity on the attitudes towards education of children where respondents are asked if they have any “Worries of not being able to give one's children a good education”.

Table 3. OLS estimates of religiosity on the attitude towards children education

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
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Orthodox beliefs	0.00728 (0.00522)				0.00941* (0.00533)
Attend religious services		0.0397*** (0.00854)			0.0581*** (0.0219)
Membership of church			0.0272*** (0.00734)		4.13e-05 (0.0121)
All Catholic				0.0392*** (0.0134)	-0.00963 (0.0226)
All protestant				0.0348** (0.0139)	-0.00329 (0.0254)
Muslims				0.0186 (0.0148)	-0.0307 (0.0246)
Jew +Buddhist+ Hindu				-0.0980*** (0.0375)	-0.0702 (0.0612)
Traditional religion				0.0710*** (0.0180)	-0.187 (0.144)
CONTROLS					
Age	-0.000247 (0.000514)	-0.00224*** (0.000301)	-0.00225*** (0.000301)	-0.00133*** (0.000320)	-0.000395 (0.000522)
Male	-0.00615 (0.0110)	-0.0141** (0.00636)	-0.0140** (0.00636)	-0.0116* (0.00665)	-0.0102 (0.0110)
Marital status	-0.00585** (0.00296)	-0.00541*** (0.00158)	-0.00558*** (0.00158)	-0.00424*** (0.00164)	-0.00687** (0.00297)
Politicalright	0.0116 (0.0106)	0.0110* (0.00626)	0.0108* (0.00626)	0.0157** (0.00656)	0.0116 (0.0105)
Income2	-0.0314*** (0.0113)	-0.0353*** (0.00718)	-0.0349*** (0.00716)	-0.0327*** (0.00756)	-0.0349*** (0.0112)
Income3	-0.0280 (0.0172)	-0.0542*** (0.00914)	-0.0543*** (0.00913)	-0.0481*** (0.00955)	-0.0321* (0.0173)
Heath2	-0.0321** (0.0150)	0.0135 (0.00913)	0.0149 (0.00910)	-0.00495 (0.00992)	-0.0362** (0.0151)
Heath3	-0.0322 (0.0204)	0.0286** (0.0132)	0.0274** (0.0131)	-0.00730 (0.0153)	-0.0345* (0.0205)
Trust	0.0420* (0.0221)	0.0410*** (0.0102)	0.0425*** (0.0102)	0.0291*** (0.0109)	0.0392* (0.0224)
Constant	0.866*** (0.0538)	0.924*** (0.0321)	0.927*** (0.0323)	0.663*** (0.0373)	0.833*** (0.0643)
Observations	2,752	13,707	13,812	12,064	2,737
R-squared	0.013	0.079	0.079	0.083	0.022

Note. Dependent variable: Worries of not being able to give one's children a good education. *, ** and *** denote significance at the 10%, 5% and 1% level of significance, respectively.

The estimation output from the single religious indicator models (Models 1 to 4) indicates that religious respondents do worry about not being able to give their children a good education, except those with Muslim religious identity who are indifferent and those with Jew/Buddhist/Hindu religious identity who indeed are not worry about the education of their offspring. However, in the full model (Model 5), most of the religiosity indicators, turns out to be insignificant. Particularly, only respondents with orthodox beliefs and those regular religious services attendants prove to be significantly worried about the quality education of their offspring.

Control variables are generally of expected signs. Specifically, a negative and significant relationship was detected for age, gender; income distribution and marital status. This implies that respondents that are either old, male, poor or unmarried have less concern about giving their children a good education. Conversely, respondents with relatively good health status, those with a general trust or those from the right political spectrum tend to be favourable to children education and do express their worries of not being able to provide them a good one. This inference is consistent across models with the exception of Model 5 in which age, gender and political spectrum do not have any effect on the attitude toward children education. In addition, health status appear to have the opposite effect in this model, which is unexpected. The next section provides further insight from an alternative measure of attitudes towards education of children where respondents are asked if they have any “University is more important for a boy than for a girl”.

4.2. Gender difference in offspring’s perceived education

Table 4 presents the estimates of respondents’ attitude concerning the education of boys and girls. Though not significant across all the specifications, estimates indicate that religious respondents do not share the view that university is more important to a boy than a girl, with the exception of Muslim. The effects of “orthodox beliefs” and “Muslims” remain significant in both individual and full models. Models 4 and 5 display a significant positive estimate of Muslim denomination, pointing to a significant evidence of gender bias in offspring education perception for the respondents with Muslim identity.

In terms of the control variables, they mainly have significant negative estimates except the political spectrum variable. What we learn from these estimates is that married individuals are more progressive in their attitudes towards the education of boys and girls as opposed to unmarried individuals. Likewise, we find that people located in the high-income scale and female respondents are more progressive than their counterparts. Contrarily, respondents on the right side of the political spectrum appear to be less reformist in their perceptions regarding education of young boys and girls compared to those on the left of the political spectrum.

Table 4. OLS estimates of religiosity on attitude towards education of boy versus girl

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Orthodox beliefs	-0.0106**				-0.0194***

	(0.00498)				(0.00704)
Attend religious services		-0.00661			-0.00711
		(0.00649)			(0.0174)
membership of church			-0.0109*		-0.0112
			(0.00647)		(0.0128)
All Catholic				-0.0572***	-0.0193
				(0.0125)	(0.0250)
All protestant				-0.0683***	-0.0145
				(0.0121)	(0.0261)
Muslims				0.0541***	0.134***
				(0.0138)	(0.0283)
Jew +Buddhist+ Hindu				-0.0496**	0.0301
				(0.0226)	(0.0413)
Traditional religion				-0.0674***	-0.00509
				(0.0148)	(0.0342)
CONTROLS					
Age	-0.000731**	-0.000459**	-0.000520**	-0.000471**	-0.000939*
	(0.000362)	(0.000232)	(0.000260)	(0.000238)	(0.000499)
Male	-0.108***	-0.0904***	-0.0874***	-0.0882***	-0.106***
	(0.00791)	(0.00508)	(0.00577)	(0.00520)	(0.0112)
Marital status	-0.00767***	-0.00597***	-0.00553***	-0.00493***	-0.00251
	(0.00195)	(0.00124)	(0.00141)	(0.00126)	(0.00282)
Politicalright	0.0392***	0.0358***	0.0279***	0.0427***	0.0199*
	(0.00812)	(0.00517)	(0.00579)	(0.00528)	(0.0111)
Income2	-0.0824***	-0.0361**	-0.0196***	-0.0330***	-0.0543***
	(0.00917)	(0.00592)	(0.00671)	(0.00606)	(0.0130)
Income3	-0.0858***	-0.0323***	-0.0115	-0.0270***	-0.0521***
	(0.0112)	(0.00722)	(0.00821)	(0.00739)	(0.0160)
Heath2	-0.00270	-0.00830	-0.0137*	-0.0149**	-0.00841
	(0.0101)	(0.00660)	(0.00745)	(0.00675)	(0.0140)
Heath3	0.00572	0.0268**	0.0276**	0.0203*	0.000163
	(0.0178)	(0.0112)	(0.0121)	(0.0117)	(0.0212)
Trust	-0.0634***	-0.0355***	-0.0218***	-0.0421***	-0.0335*
	(0.0121)	(0.00733)	(0.00820)	(0.00755)	(0.0171)
				(0.0148)	(0.0342)
Constant	0.541***	0.406***	0.469***	0.462***	0.405***
	(0.0444)	(0.0280)	(0.0296)	(0.0397)	(0.0655)
Observations	11,773	31,649	25,342	29,775	5,822
R-squared	0.094	0.072	0.067	0.083	0.106

Note. University is more important for a boy than for a girl. *, ** and *** denote significance at the 10%, 5% and 1% level of significance, respectively.

A number of similarities across the two education indicators are worth noting. Models 1, 3 and 4 of Tables 3 and 4. Respondents with orthodox beliefs, besides being worried not be able to give their children a good education, do not display a gender bias in the education of boys and girls at the university level (Model 1). Similarly, respondents self-reported members of a church, do have concerns about the education of children and do not exhibit gender discrimination for higher education; possibly suggestive of the fact that individuals belonging to various church denominations are more enlightened than non-members. The same conclusion emerges from respondents with various religious identities, namely Catholics, Protestants and traditional religion (also referred to as African religion). These findings imply that religiosity indeed plays an

important role in driving the offspring education investment decision. Particularly, religious individuals are favorable to children education, although some religious denominations may display a gender bias at a higher level of education.

However, Tables 3 and 4 reveal that some of the patterns of the religiosity measures that were observed in Models 1 to 4, do not reappear in Model 5, which includes all features of religiosity and control variables. Specifically, though orthodox beliefs coefficient and religious attendance maintain their sign and level of significance, self-reported membership is no longer statistically significant in Table 4. Similarly, some coefficients of religious denominations (such as Catholic, Protestants, Jew +Buddhist+ Hindu, Traditional religion) seem to change level of significance except for Muslims. This observation motivates the needs to explore the joint effects of the religiosity involvement (orthodox beliefs, attendance of religious services and church membership) and religious denominations (Catholics, Protestants, Muslims, traditional religion and Jew +Buddhist+ Hindu). This classification helps differentiate between African religion (traditional religion) and Asian religion (Jew +Buddhist+ Hindu).

4.3. Variations by denomination

Table 5 attempts to explore the extent to which the effects of different dimensions of religiosity might vary by the denomination (Models 1, 2, 3, 4 and 5 for Catholic, Protestant, Muslim, Jew+Buddhist+Hindu and Traditional religion, respectively).

The results by religious denomination suggest that orthodox belief does not have a significant influence on attitudes towards education of boys and girls across all religious denominations. As regards the effect of self-reported membership, the results show a positive and significant effect on attitudes towards education of boys and girls for only Catholics and Muslims. Of paramount importance is the fact that the sign changes when we disaggregate the sample by religious denominations, implying that estimates based on the full sample conceal these variation. For religious attendance, there are only significant effects in the case of Protestants, Muslims, and Traditional religion.

Table 5. OLS estimates of religiosity on offspring’s education attitude by religious denomination

	Catholics	Protestants	Muslims	Asian	African
Panel A. Dependent variable: Worries of not being able to give one's children a good education					
Orthodox beliefs	0.00179	0.00552	0.0253***	0.0665	0.0272

	-0.00903	-0.0119	-0.00835	-0.0466	0.000
Attend religious services	0.0343*	0.0314	0.0294	0.278***	0.0448
	-0.0178	-0.021	-0.0207	-0.0768	-0.0351
Membership of church	-0.0129	-0.00135	0.0454***	0.193**	-0.00266
	-0.0111	-0.0127	-0.0158	-0.0815	-0.0259
Observations	3,567	3,575	2,310	156	1,288
R-squared	0.02	0.018	0.039	0.191	0.011
Panel B. Dependent variable: University is more important for a boy than for a girl					
Orthodox beliefs	-0.00843	-0.0146	-0.0093	-0.0018	-0.0036
	(-0.0103)	(-0.00909)	(-0.0154)	(-0.023)	(-0.0194)
Membership of church	0.0292***	-0.018	0.0484***	0.0841	0.0181
	(-0.0109)	(-0.0111)	(-0.0133)	(-0.0601)	(-0.0235)
Attend religious services	0.0148	0.0382***	0.0325***	0.0508	-0.0649**
	(-0.0155)	(-0.0139)	(-0.0123)	(-0.0433)	(-0.028)
Observations	7,036	10,002	8,261	421	2,227
R-squared	0.03	0.022	0.047	0.074	0.027

Note. *, ** and *** denote significance at the 10%, 5% and 1% level of significance, respectively. Religious denomination groups or religious identity regroups Catholics, Protestants, Jew/Buddhist/Hindu and traditional religion. Jew/Buddhist/Hindu are grouped under Asian religion while traditional religion is referred to as African religion.

Interestingly, it appears that respondents identified as Catholics who regularly attend religious services do worry about the quality education of children but (Panel A, column 1) Catholics respondents who are active church members do exhibit gender discrimination at high education (Panel B, column 1). All Protestants and African religious at different level of religiosity appear to be indifferent about the quality education of children (Panel A, columns 2 and 5) but Protestants who frequently attend religious service remain gender biased for higher education for boy and girl (Panel B, column 2). Muslims respondents with orthodox belief or active membership display a significant concern about the quality education of children (Panel A, column 3). In addition, Muslim with active membership or frequent religious services attendance appear to be more inclined to the education of a boy than a girl at the university level (Panel B, Model 3). While Asian religious various level of religiosity are indifferent to the education of boy and girl at the university level (Panel B, column 4), those with active church membership an frequent religious service attendance seem to be supportive of the quality education of children (Panel A, column 4). Surprisingly, African religious who regularly attend religious services are more inclined to tertiary education for both genders than their peers with active membership or who have orthodox beliefs (Panel B, column 5). In general and across all denominations, religious with orthodox beliefs are indifferent to the education of boy and girl at the university level, while Catholics, Protestants and Muslims with active membership or regular church attendance appear to be biased about the boy and girl education at the tertiary level. This could possibly be attributed to the tendency of educated

individuals to advocate gender equality which is contrary to the religious principles across the majority of religious denominations.

4.4. Robustness analysis

Table 6. Probit estimates of Religiosity on offspring education perception

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Panel A. Dependent variable: Worries of not being able to give one's children a good education					
Orthodox beliefs	0.025712 0.036985				0.001441 0.03853
Attend religious services		0.161184*** 0.032499			0.089375 0.040837*
membership of church			0.117227*** 0.0312		0.064295 0.033929
All Catholic				0.162623*** 0.052915	0.107992 0.057766
All protestant				0.133242** 0.054174	0.067218 0.059187
Muslims				0.061355 0.061911	0.013512 0.06502
Jew +Buddhist+ Hindu				-0.29341** 0.11436	-0.24801* 0.119736
Traditional religion				0.238824** 0.059672	0.198931*** 0.066477
Panel B. Dependent variable: University is more important for a boy than for a girl					
Orthodox beliefs	-0.06741** (-0.00279)				-0.0778936** (0.028761)
Attend religious services		-0.024398 (0.019438)			-0.0266245 (0.031927)
membership of church			-0.02768 (0.02023)		0.006115 (0.025795)
All Catholic				-0.17798*** (0.037132)	-0.21444*** (0.045951)
All protestant				-0.20067*** (0.036082)	-0.1783*** (0.046422)
Muslims				0.151385*** (0.040103)	0.235739*** (0.051234)
Jew +Buddhist+ Hindu				-0.1526* (0.076011)	-0.14022 (0.097468)
Traditional religion				-0.19498*** (0.043437)	-0.25121*** 0.054705

Note. *, ** and *** denote significance at the 10%, 5% and 1% level of significance, respectively.

As indicated earlier, an alternative approach to the clustered OLS is the marginal effects estimates from the probit model which addresses the shortcomings of the linear probability model by relying on a nonlinear transformation function, namely the normal distribution function. Table 6 displays the estimated marginal effects for both education indicators in panels A and B, respectively. In general, probit and OLS estimates are consistent for the first four models but the fifth model probit estimates are better than the OLS alternative, namely in terms of the number of significant

coefficients. OLS estimates of Model 5 display significant coefficients for the orthodox beliefs and religious attendance while the probit estimates prove the church membership, the Asian and the African religious identities to be significant in explaining the attitude of the respondents toward the quality education of children, across Models 3, 4 and 5. Barring the Asian religious identity, the second panel of the probit estimates is consistent with the OLS estimates at the acceptable level of significance. Again Model 5 estimates improve under probit specification, depicting three more significant religiosity indicators besides the orthodox beliefs and Muslim identity selected by OLS estimates.

Overall, religiosity matters for human capital investment in Africa besides the traditional economic and demographic factors. The religiosity involvement and/or religious denomination affect to some extent the attitude toward the quality education of children and/or the maximum level of education of boy versus girl. Across religious denomination, it is revealed that religious individuals with various levels of religiosity tend to prone the higher education for a boy rather than a girl. This is likely to be the case because education system in African encourages gender equality, particularly at higher education level, which is, however, incompatible with the religious principles that determine the primary identity of Africans. The fact that individuals identified by their religious affiliation prove to be less inclined to gender bias towards the education at the university level (both with OLS and probit estimation) than their peers who are either active church member or regular attendant of religious services might be suggestive of the misapprehension of the gender inequality between education system and religious scheme. This mismatch between culture and education in Africa can be addressed by promoting religious education as part of the curriculum.

5. Conclusion

This study sets to analyse the correlation between religious affiliation and the perception of human capital investment with the ultimate goal to investigate whether religion could explain the poor human capital development in Africa. It pools different waves of the World Values Surveys from 1981 to 2020 across thirteen African countries and report a significant association between religious involvement and offspring education perception across different religious denominations. Empirical results from clustered OLS indicate that individual's perception of offspring education correlate significantly with religiosity involvement, namely "being active member of a religious group" or having "Orthodox beliefs". Further differentiated attitudes toward education of boys and girls are revealed across religious representations, with Catholics, Protestants, Jew +Buddhist+

Hindu and traditional religion appearing to be more progressive than Muslims and non-religious individuals. Sorting religiosity involvement by religious denominations suggests that, self-reported membership has a positive and significant effect on attitudes towards quality education of children for Muslims and Asian religious and towards education of boys and girls for Catholics and Muslims. In addition, there is a significant evidence that regular religious services attendance correlates with the statement that “university is more important for a boy than for a girl”, positively for Protestants and Muslims affiliates but negatively for Traditional religion affiliates. However, Catholics and Asian affiliates who regularly attend religious services are likely to be worried about not being able to give their children quality education. These findings suggest that indeed religion is not detrimental to education; however, some aspects of education might be inconsistent with religious faith, irrespective of the denomination. In religion driven context like Africa, education system should be inclusive of general cultural norms including religious values. These results, however, need further insight such as causal analyses to inform education policy about potential reforms required to address the incompatibility between education system and religious norms in Africa.

References

- Atran, S. and Norenzayan, A. (2004). Religion's evolutionary landscape: Counterintuition, commitment, compassion, communion. . *Behavioral and Brain Sciences*, 713–770. .
- Barrett, J. L. (2007). Cognitive science of religion: What is it and why is it? . *Religion Compass*, 1, 1–19.
- Bascia, N. and Osmond, P. (2013). *Teacher union-governmental relation in the context of educational reform*. Toronto: Education International.
- Boyer, P. (2001). *Religion Explained*. New York: NY: Basic Books.
- Byfield, C. (2008). The impact of religion on the educational achievement of Black boys: A UK and USA study. *British Journal of Sociology of Education*, 29(2), 189-199.
- Darnell, A. and Sherkat, D.E. . (1997). The impact of Protestant fundamentalism on educational attainment. *American Sociological Review* , 62(2), 306–315.
- Feldmann, F. (2019). World religions and human capital investment: The case of primary education. *Journal of Interdisciplinary Economics*, 31(2), 101–123.
- Gill, S., Khurshid, M.K., Mahmood, S. and Ali, A. (2018). Factors Effecting Investment Decision Making Behavior: The Mediating Role of information searches. *European Online Journal of Natural and Social Sciences* , 7(4), 758-767.
- Inglehart, R., and Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review*, 65(1), 19-51.
- Manigault, L. S., Aderbigbe, I. S., Medine, C. M. J., and Seibel, H. D. (2017). Review of Contemporary Perspectives on Religions in Africa and the African Diaspora. *CLA Journal*, 60(4), 519–522. Retrieved from <https://www.jstor.org/stable/26557012>
- Mayrl, D. and Oeur, F. (2009). Religion and higher education: Current knowledge and direction for future research. *Journal for the Scientific Study of Religion*, 48(2), 260-275.
- Regnerus, M. (2000). Shaping schooling success: Religious socialization and educational outcomes in metropolitan public schools. *Journal for the Social Scientific Study of Religion*, 39(2), 363-370.
- Sax, L.J., Gilmartin, S.K., Keup, J.R., Bryant, A.N. and Plecha, M. (2002). *Findings from the 2001 pilot administration of Your First College Year (YFCY): National norms*. Los Angeles, CA: Higher Education Research Institute.
- Smith, C. and Denton, M.L. (2005). *Soul searching: The religious and spiritual lives of American teenagers*. New York: Oxford University Press.
- Takemura, K. (2021). Behavioral Decision Theory. In *Oxford Research Encyclopedias* (p. Forthcoming). Oxford: xford University Press. doi:<https://doi.org/10.1093/acrefore/9780190228637.013.958>

- Talatovna, G.Z. and Bahodirjanovich, G.S. (2020). Development of Education system in the context of world experience and national specificity as an investment in human capital. *Journal of Critical Reviews*, 7(12), 302-308.
- Walker, K. L. and Dixon, V. . (2002). Spirituality and academic performance among African American college students. *Journal of Black Psychology* , 28(2), 107–21.
- Willard, A.K., Cingl, L. and Norenzayan, A. (2020). Cognitive Biases and Religious Belief: A Path Model Replication in the Czech Republic and Slovakia With a Focus on Anthropomorphism. *Social Psychological and Personality Science*, 11(1), 97-106.
- Zern, D. (1989). Some connections between increasing religiousness and academic accomplishment in a college population. *Adolescence*, 24, 141–54.