Religion and Educational Mobility in Africa

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AEA Meetings

January 2022

Presentation Structure

1. **Introduction and Motivation**
2. **Data and Approach**
3. **Intergenerational Mobility (IM) across Religious Affiliation**
4. **Drivers of Educational Mobility across Religious Affiliation**
5. **Regional Childhood Exposure Effects vs Spatial Sorting**
6. **Mapping and Correlates of IM Religious Gaps**
7. **Discussion. Further Evidence**
8. **Conclusion**

Motivation

Education in Africa. Distribution

- **Large gains in education across Africa; mostly primary [more recently secondary and tertiary]**

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- **Large gains in education across Africa; mostly primary [more recently secondary and tertiary]**
- **Have these gains been distributed equally?**
- **Zoom in on Religion**
  - Not much research [Evans and Acosta (2020) education review in Africa 145 papers, no discussion of religion]
  - Move *beyond* ethnicity [research emphasis]
  - *beyond* regional differences [some works]; our results cond. on region and ethnicity

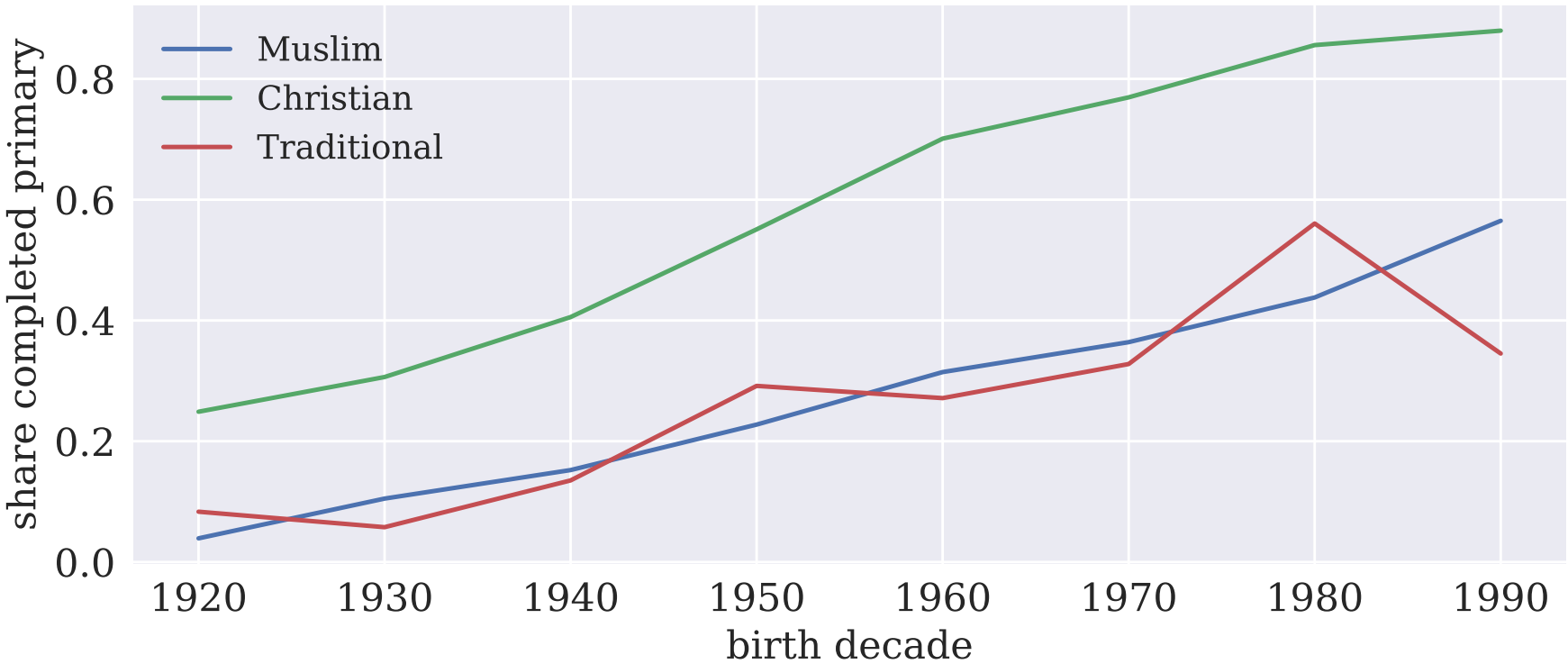
Motivation

Importance of Religion in Africa

- **Afrobarometer 6**: 78% Africans attend a church or mosque once a week or more.
  - Muslims 83%; Christians 75%.
- **Afrobarometer 4**: 84% Africans report that religion is very important and an extra 10% report that religion is somewhat important.
  - Feelings shared by both African Christians and Muslims.; somewhat higher for Muslims (91% versus 85.5%)
- case studies and narratives; no systematic exploration

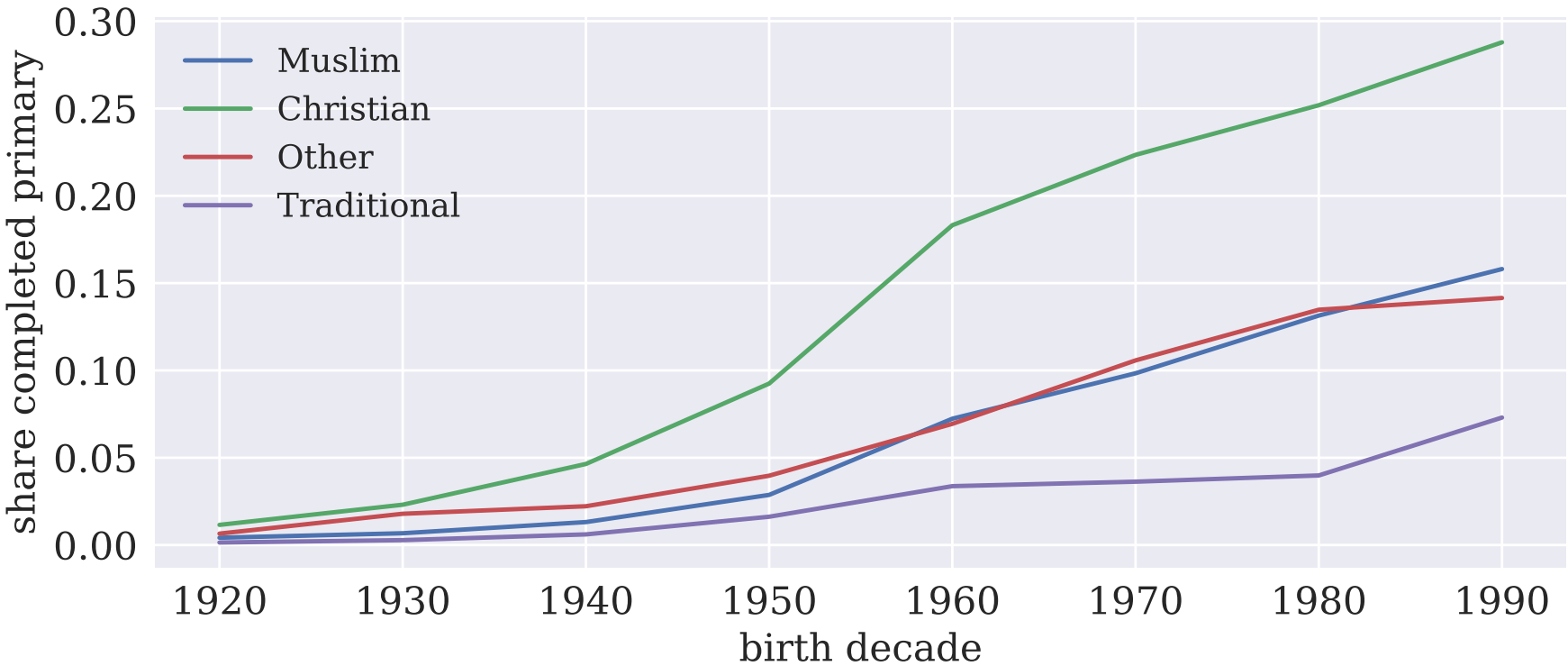
Example 1. Completed Primary across Religions

Nigeria. Individuals 14+



Example 2. Completed Primary across Religions

Ethiopia. Individuals 14+



Motivational Patterns. Years of Schooling

Christians, Muslims, and Animists, aged 14+

	group percentage			1940s				1980s			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
country	Christian	Muslim	Traditional	Christian	Muslim	Traditional	$\Delta(c-m)$	Christian	Muslim	Traditional	$\Delta(c-m)$
Botswana	76.0	0.6	4.9	3.53	9.44	1.3		10.8	11.19	8.62	
Egypt	5.6	94.4		4.9	2.76			9.25	8.52		
South Africa	82.7	1.5	0.2	6.01	8.13	1.99		9.16	10.48	7.85	
Nigeria	52.5	46.6	0.9	3.68	1.38	1.08		9.07	3.95	5.26	
Ghana	70.1	16.9	6.6	6.02	1.85	0.98		8.26	4.55	1.94	
Cameroon	69.2	20.9	5.6	4.46	2.03	1.64		7.9	2.88	2.27	
Zambia	91.7	0.5	4.3	3.84	4.19	3.42		7.25	7.88	7.05	
Togo	47.9	15.7	29.0	3.51	1.07	0.52		7.12	4.35	2.78	
Malawi	81.4	12.9	2.4	3.35	1.49	2.19		6.57	4.78	4.95	
Senegal	4.2	95.2		3.69	1.14			6.22	2.6		
Uganda	85.5	11.2	0.8	3.05	2.84	0.44		5.41	5.64	0.53	
Benin	44.2	25.4	22.0	2.77	0.85	0.28		5.2	2.62	2.22	
Liberia	85.8	12.1	0.6	2.51	1.73	0.64		5.07	3.42	2.19	
Rwanda	93.2	1.8	0.3	1.66	2.14	0.27		4.76	5.84	5.62	
Sierra Leone	21.1	76.7	0.1	3.88	0.84	0.0		4.53	2.2	1.31	
Mali	2.4	95.1	2.0	1.36	0.7	0.18		3.87	2.09	0.63	
Burkina Faso	21.6	58.7	18.8	1.07	0.23	0.05		3.67	1.56	0.45	
Mozambique	56.4	18.0	6.7	1.43	0.92	1.54		3.16	2.23	3.41	
Ethiopia	64.0	31.1	3.9	0.84	0.38	0.16		2.91	1.47	0.61	
Guinea	5.7	86.9	3.0	2.21	0.64	0.12		2.91	1.4	0.81	

Motivational Patterns (cont). Primary Completed

Christians, Muslims, and Animists, aged 14+

	group percentage			1950s				1990s			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
country	Christian	Muslim	Traditional	Christian	Muslim	Traditional	$\Delta(c-m)$	Christian	Muslim	Traditional	$\Delta(c-m)$
Botswana	76.0	0.6	4.9	0.51	0.78	0.24		0.96	0.92	0.82	
Egypt	5.6	94.4		0.47	0.31			0.88	0.87		
Nigeria	52.5	46.6	0.9	0.55	0.23	0.29		0.88	0.57	0.35	
South Africa	82.7	1.5	0.2	0.66	0.9	0.27		0.84	0.95	0.79	
Ghana	70.1	16.9	6.6	0.62	0.23	0.12		0.77	0.57	0.3	
Cameroon	69.2	20.9	5.6	0.68	0.3	0.21		0.76	0.42	0.39	
Togo	47.9	15.7	29.0	0.5	0.19	0.11		0.73	0.57	0.42	
Zambia	91.7	0.5	4.3	0.55	0.57	0.5		0.72	0.76	0.7	
Benin	44.2	25.4	22.0	0.35	0.12	0.04		0.65	0.4	0.45	
Senegal	4.2	95.2		0.46	0.21			0.64	0.3		
Uganda	85.5	11.2	0.8	0.37	0.41	0.04		0.52	0.61	0.03	
Sierra Leone	21.1	76.7	0.1	0.43	0.15	0.04		0.49	0.29	0.25	
Mali	2.4	95.1	2.0	0.21	0.11	0.02		0.43	0.3	0.18	
Rwanda	93.2	1.8	0.3	0.2	0.32	0.03		0.39	0.55	0.38	
Burkina Faso	21.6	58.7	18.8	0.19	0.05	0.01		0.36	0.19	0.08	
Liberia	85.8	12.1	0.6	0.36	0.23	0.14		0.32	0.3	0.14	
Malawi	81.4	12.9	2.4	0.25	0.11	0.16		0.31	0.2	0.18	
Guinea	5.7	86.9	3.0	0.36	0.14	0.07		0.3	0.22	0.16	
Ethiopia	64.0	31.1	3.9	0.09	0.03	0.02		0.29	0.16	0.07	
Mozambique	56.4	18.0	6.7	0.1	0.06	0.12		0.2	0.12	0.23	

Motivation, cont. Religion in Africa

Two Experiments and Looking Ahead

1. **Christianity in Africa** coined as the "biggest social experiment" [Meyer (2004), Nunn (2012)]
2. **Islam is the fastest religious group in Africa** [Levzion (2016), Shahin (1997), Jansons]

Coexistence by 2050? [Pew Forum Projections]

- Sub-Saharan African population about 1.9 billion (from 823m)
- Muslim population 670 million from 248 million
- Christian population 1.1 billion from 517 million

Broader Motivation. Conflict?

Religious Fundamentalism and Conflict in Africa

Boko Haram 'western education is sinful' (Hausa)

- **Religious strains and conflict in the Sahel** [Nigeria, Mali, Sudan, Burkina Faso, Niger, and the Central African Republic] evolving around religion (North-South)
- **Religion instrumental in many other African countries** [e.g., Ethiopia (Ogaden), East Africa, (North) Mozambique]
- **Religious discrimination, repression, and nationalism is rising in Africa** [e.g., Fox (2004), Basedau and Schaefer-Kehnert (2019)]

This Paper

Religion and Educational Opportunity across African Countries and Regions

1. **IM statistics across religious lines**. **20 countries, 2,105 regions**: sizable differences in educational IM across religion
2. **Potential Drivers of religious IM gaps**
   - Family/Household Features [e.g., size, age of marriage]
   - Economic Traits [employment sector, profession, rural-urban]
   - Regional Features [segregation]
3. **Regional Childhood Exposure Effects by Religion**
   - Causal effects of regions *similar* for all religious groups
4. **Characterize religious IM (gaps)**. Regional Correlates
   - Regional Development, Location, Colonial Investments
   - Own Religion Share - Segregation
5. **Survey Evidence - Discussion**

Broader Research Agenda

Study Educational Opportunity in Africa since Independence

- **Map regional differences in mobility; understand origins; distinguish region's causal role from sorting** (Alesina, Hohmann, Michalopoulos, and Papaioannou (ECMA 2021); ongoing work with Brandon Tan (Harvard) and Taner Regan (LBS))
- **Understand the role of educational policies** (e.g., compulsory primary schooling laws, expansion of schooling infrastructure); ongoing work with Torsten Walter (NYU)
- **Understand ethnic inequality in educational opportunity** (building on Alesina, Michalopoulos, and Papaioannou (JPE 2016) with Tanner Regan (LBS))
- **Forced displacement, Education, and Structural Transformation** (Chiovelli, Michalopoulos, Sequeira, and Papaioannou (2021)
- Other

Religion, Economics, and Education

Literature

- **Education in Africa**
  - *Review*. Evans and Mendez Acosta (2021). no mention of religion, Islam or Christianity. 145 papers.
  - *Exception*. Platas (2018), descriptives and case study in Malawi
- **Religion and Economic Performance: Reviews**
  - *General Reviews*: Iyer (2016), Guiso, Sapienza, and Zingales (2003), Becker et al. (2020), Barro and McCleary (2003)
  - *Review on Islam*: Kuran (2018) Islam and Economic Performance
- **Islam in Africa**
  - Platas Izama (2018), Bauer, Platas, and Weinstein (2019), Mc Cauley (2014), Basedau (2017)

Intergenerational Mobility

Dimensions. Income, Earnings, Wealth, Education

- **Income, Lifetime Earnings** [mostly developed-industrial countries]

  Erikson and Goldthorpe (1992); Checchi et al. (1999); Jantti et al. (2006); Corak (2006); Hertz et al. (2008); Mayer and Lopoo (2008); Long and Ferrie (2013); Clark (2014); Chetty et al. (2014, 2016); Derenoncourt (2019)

  - Mapping and correlational analysis. Where is the Land of Opportunity? [Chetty et al. QJE 2014, Chetty et al. 2020]
  - Causal impact of regions vs. sorting [Chetty and Hendren QJE 2018a,b]

- **Education. [reviews Solon (1999) and Black and Deveroux (2011)]**

  "In addition to earnings, educational attainment provides an important source of information about the lives of individuals; as a result, there has been extensive study of intergenerational transmission of education. As a practical matter, education has advantages over earnings in terms of estimation; with education, measurement issues are much less difficult. People tend to complete education by their mid- twenties so, unlike with lifetime earnings, analysis can successfully take place when children are relatively early in the life-cycle. Also, non-employment causes no difficulties, and measurement error is likely to be much less of a problem as people tend to know their own educational attainment. Furthermore, there is now an extensive literature that shows that higher education is associated with many other beneficial characteristics such as higher earnings, better health and longer lifespans."

- **Intergenerational Transmission. Education** [Becker and Tomes (1976), Loury (1981)]

Intergenerational Mobility in Education across Space

Educational IM

- Hertz et al. (2007). **42 countries (only 3 African)**
- World Bank, survey cross-country data (van der Weide et al. (2021)). **153 countries**
  - survey data
  - construct measures of IM in education and income across many countries
- Alesina, Hohmann, Michalopoulos, and Papaioannou (2021). **African countries and regions**
- Asher, Novosad, and Rafkin (2020). **India**
  - mapping educational IM across Indian districts, castes, and religious groups
  - correlates of regional IM
- Card, Domnisoru, and Taylor (2018). **United States in 1920-1940**
  - mapping educational IM across US states and racial groups
  - educational policies and educational IM
- Hildger (2017). **United States Long-Run**

Intergenerational Mobility and Race

United States Focus

- Borjas (QJE 1992, AER 1995). **Ethnic Capital**
  - Ethnicity as externality in human capital accumulation
  - skills of current generation depend on parental and ethnic capital
  - Ethnic capital stronger in ethnically segregated neighborhoods
- Chetty et al. (QJE 2020). **Race and Mobility**
  - Large variation in IM across race
  - Family characteristics explain little of black-white gap in IM conditional in income (as in our setting)
  - Regions do not matter much (opposite finding here)
  - Black-white gap IM among boys remains even in the same neighborhood
- Davis and Mazumder (2018). **Race and Ethnic Background**
  - estimates of IM by region and ethnicity/race
  - ethnic IM gaps are larger than regional gaps
  - migration explains little of variation in IM

African Development

Historical and Post-Independence Features

- **Economics Research** religion under-explored
  - **National Policies and Factors** Collier and Gunning (JEL 2001)
  - **Educational Reforms** Evans and Mendez Acosta (2021)
  - **Historical Factors** Michalopoulos and Papaioannou (JEL 2020)

- **Political Science, Sociology, and History** narratives, descriptive
  - **review** Meier zu Selhausen (2019))
  - **case studies** Meier zu Selhausen, van Leeuwen, and Weisdorf (2018), Fourie and Swanepoel (2015)
  - **descriptives and case study** Platas (2018)

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Section Structure

1. **Data. IPUMS**
2. **Methodology**
   - Cohabitation
   - Cohort Effects/Trends
3. **Education Dynamics and Absolute IM**

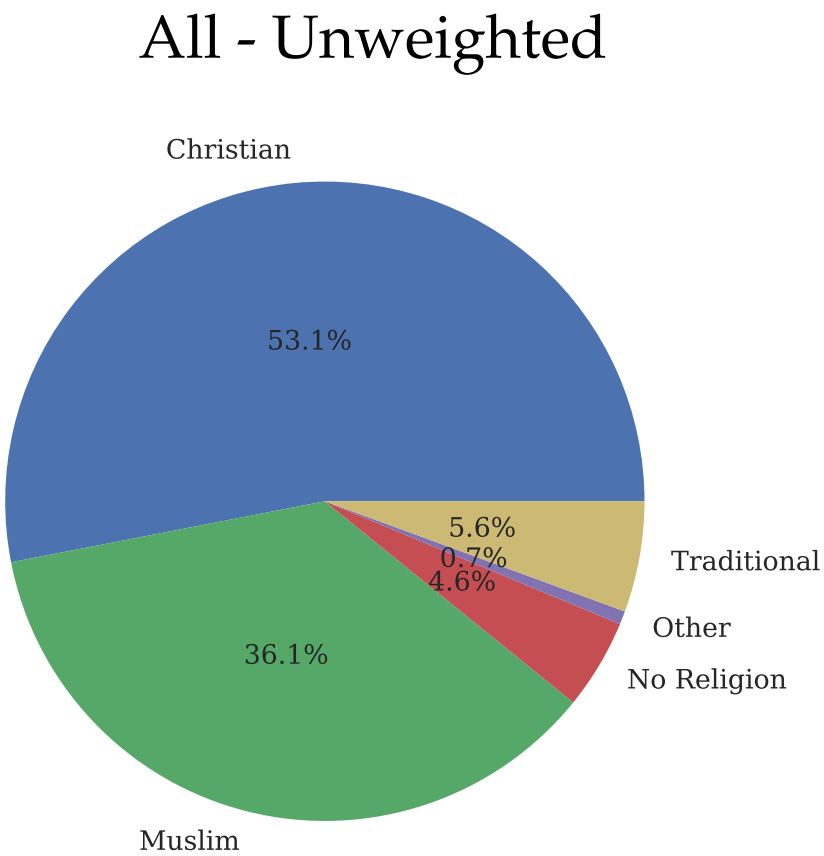
International IPUMS, Census data

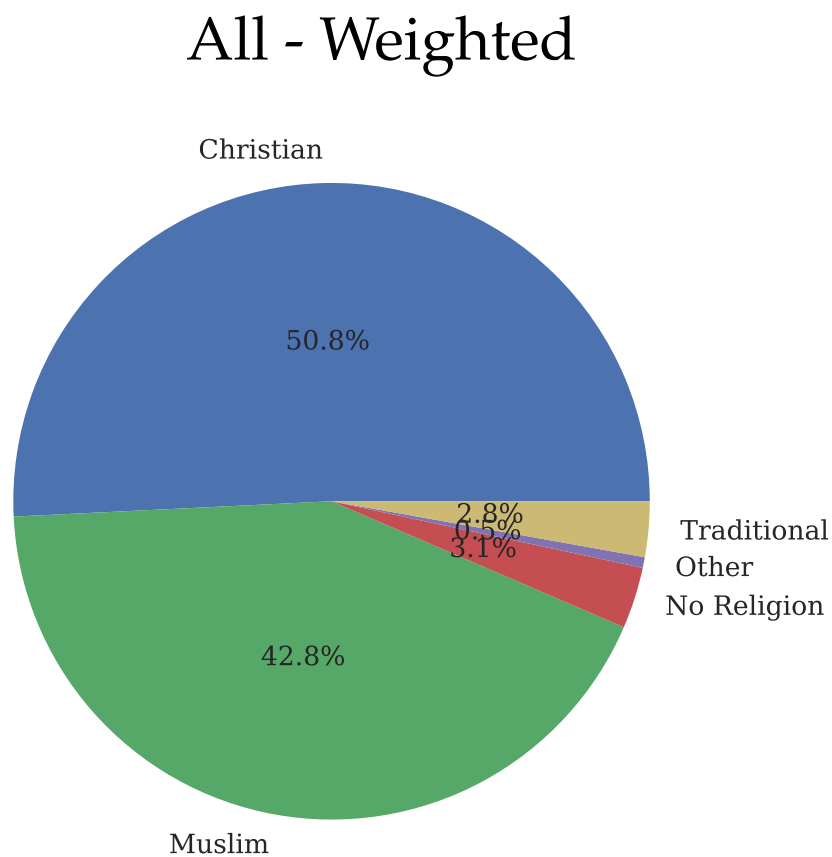
Data Features

- Representative samples (typically 10%) from national censuses [exception Nigeria, household surveys]
- Examine individuals aged 14-18 and 14-25
- 6,392,474 (young) individuals (14-18 age)
- 11,420,731 (young) individuals (14-25 age)
- **20 countries**; 38 censuses (1970-2013)
  - Benin, Botswana, Burkina Faso, Cameroon, Egypt, Ethiopia, Liberia, Ghana, Guinea, Mali, Malawi, Mozambique, Nigeria, Rwanda, Uganda, South Africa, Sierra Leone, Zambia, Togo, Uganda
- **2,205 districts** (mostly admin-2/3 units)

Religion Shares in the Sample

Unweighted and Population Weighted [Nigeria]





Methodology. Absolute IM

Chetty et al. (2014, 2016) definitions

- "Relative" IM
  - Regressions of (relative) child outcomes (education) on (relative) parental outcomes
- "Absolute" IM
  - Likelihood of children having outcome y conditional on parents having (relative) outcome x. ($\Rightarrow$ likelihood of having better / worse outcomes than parents)

This paper: absolute educational IM [also in Alesina, et al. (2021) and Chetty et al. (2017); like parallel work of Card et al. (2018), also Derenoncourt (2020) and Hilger (2020)]

- Upward IM: Likelihood that children of parents with less than primary education ("illiterate") complete at least primary ("literate")
- Downward IM: Likelihood that children of parents at least primary education fail to complete primary school

Absolute Intergenerational Mobility

Measuring social mobility using multi-generational households

IM: compare individuals' education to "previous generation"

- Households where more than one generation lives in the same households
- *Relationship to household head* → assign individuals to "generations"
  - **head, spouse, siblings**
  - **children, nephews, nieces**
  - grandchildren
  - parents, uncles, aunts
  - grandparents

Co-residence

Assessing primary school attainment vis a vis parents

Tension

(A) Younger individuals more likely to live with their parents

(B) Older individuals more likely to have finished education

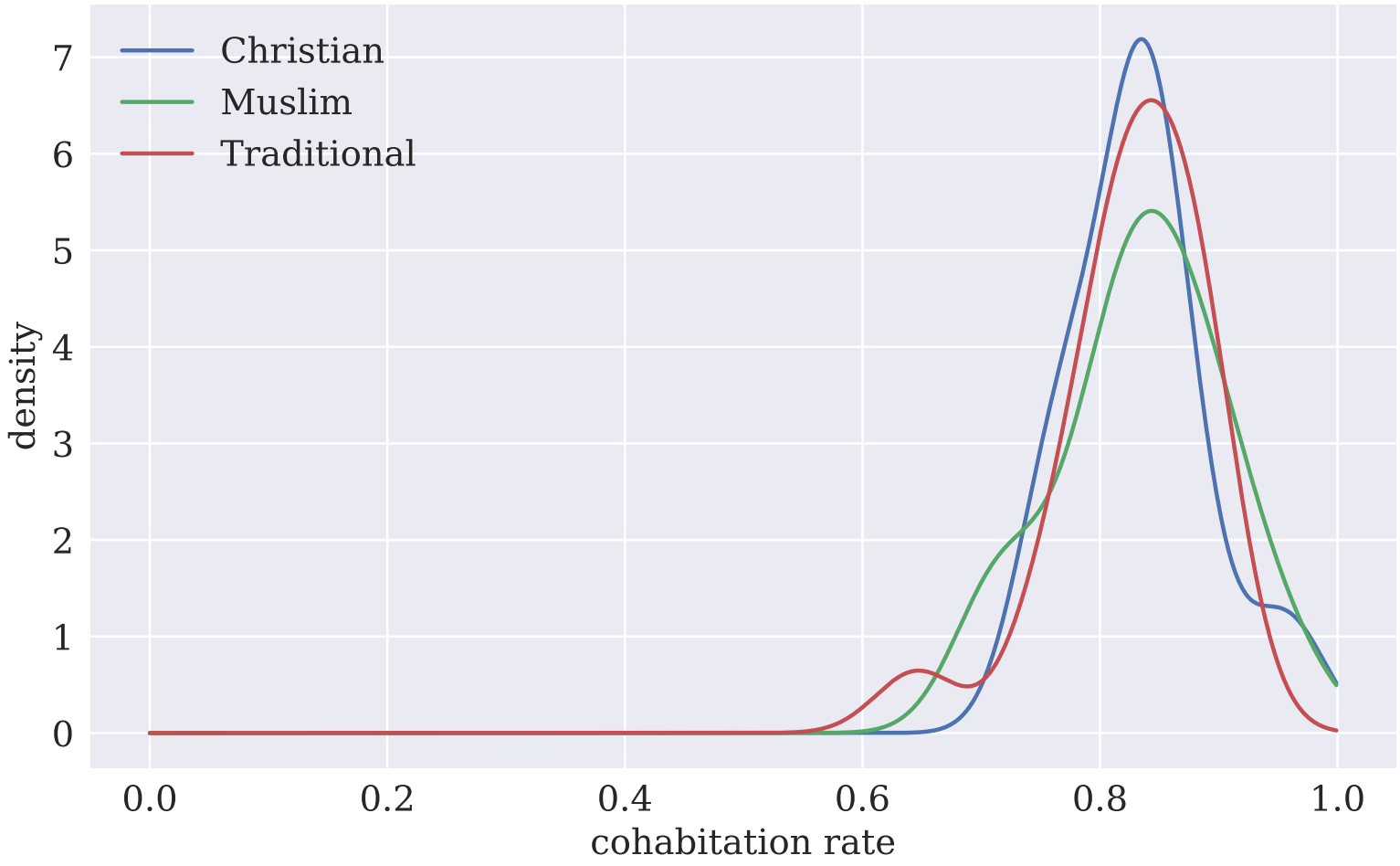
⇒ **to deal with (A) and (B)**

- individuals aged 14-18 (80%-90% co-residence rate in the sample compared to 95.1% for 8-year olds) (Card, Domnisory, and Taylor, 2018)

- at the same time, old enough to have completed primary school
- compare results to results from individuals aged 14-25 and 14+
- no major differences across religious affiliation

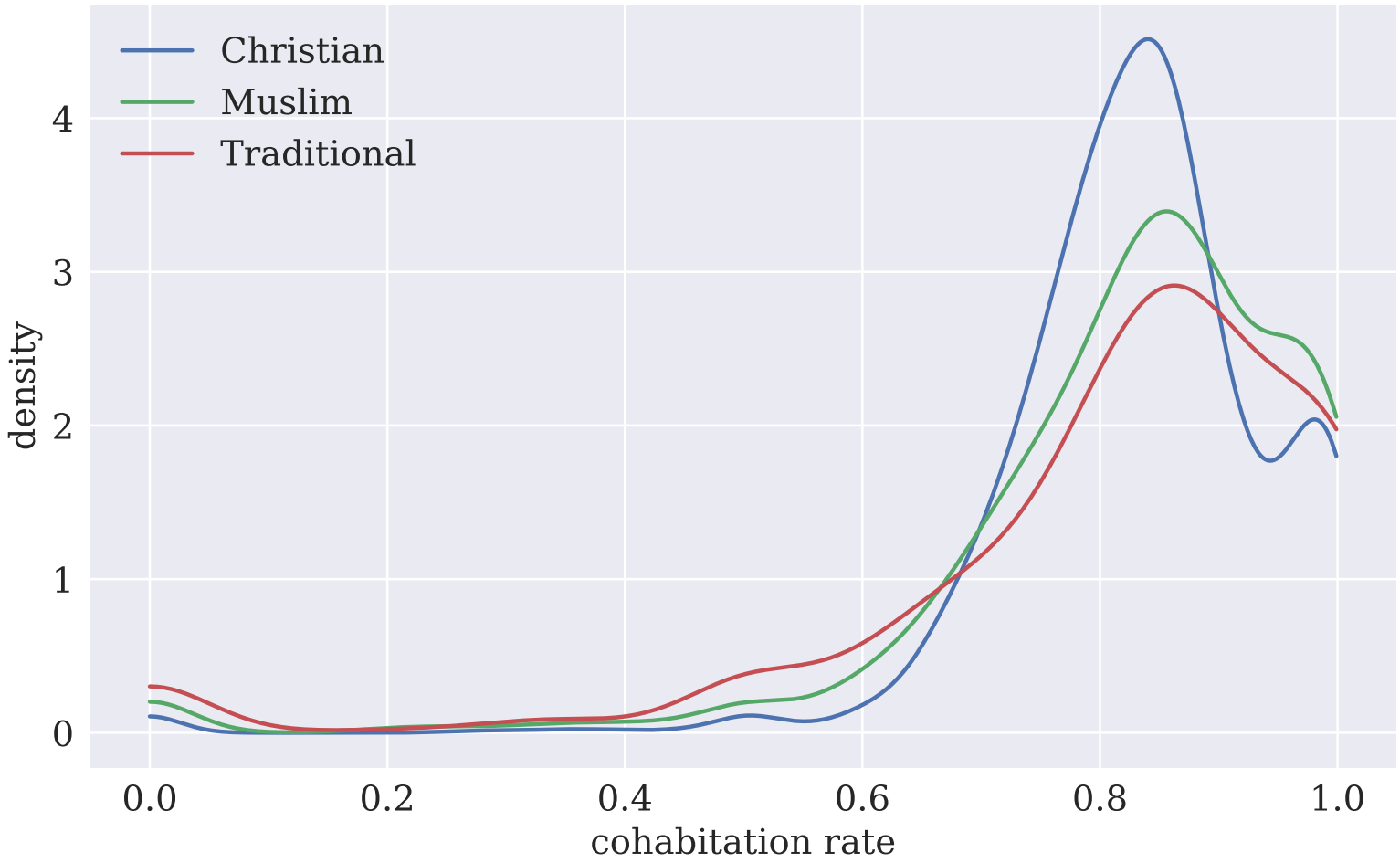
Country-Level Co-residence Rates 14-18 yo

Muslims, Animists, Christians



District-Level Co-residence Rates

Muslims, Animists, Christians



Methodology

Time and cohort effects

Step 1. Define indicator variables

- lit_par_{ibct} = 1 if the parents of child i born in birth-cohort b in country c and observed in census t are literate and zero otherwise
- IM_up_{ibct} = 1 if a child i born to illiterate parents in (decadal) birth-cohort b in country c and observed in census year t is literate and zero otherwise.
- IM_down_{ibct} = 1 if a child i born to literate parents in (decadal) birth-cohort b in country c and observed in census year t is illiterate and zero otherwise.

Step 2. For all individuals, estimate

$$\text{lit\_par}_{ibct} = \alpha^{o}_{cb} + \epsilon_{ict}$$
$$\text{IM\_up/down}_{ibct} = \alpha^{y}_{cb} + \epsilon_{ict},$$

$\hat{\alpha}^{o}_{cb}$ share of literate parents in country/district c, birth-cohort b.

$\hat{\alpha}^{y}_{cb}$ estimate of upward/downward IM in country/district c, birth-cohort b.

Education Dynamics and Absolute IM

A Simple Conceptual Framework

- g : religious group, b : birth-cohort
- $\phi_{g,b}$ share of literate individuals for religious group in the cohort
- $u_{g,b}$: **absolute upward mobility.** Likelihood that kids (cohort $b+1$) of illiterate parents (cohort b) will be literate
- $d_{g,b}$: **absolute downward mobility.** Likelihood that kids (cohort $b+1$) of literate parents (cohort b) will be illiterate

$$\phi_{g,b+1} = \phi_{g,b}(1 - d_{g,b}) + (1 - \phi_{g,b})u_{g,b}$$
$$\Leftrightarrow \quad \Delta\phi_{g,b+1} = u_{g,b} - \phi_{g,b}(u_{g,b} + d_{g,b})$$

- **Decomposition** Changes in completed primary for religious groups (in a given country): abs. up. IM and abs. down. IM

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Section Structure

New Measures. IM in Education across Religious Affiliation

1. **Intergenerational Mobility across Religious Affiliation for 20 African Countries**

2. **Cross-Country Correlates**
   - 2.1 Religious IM [Christian, Animists, Muslims]
   - 2.2 Religious IM Gap [Christian-Muslim, Christian-Animist]

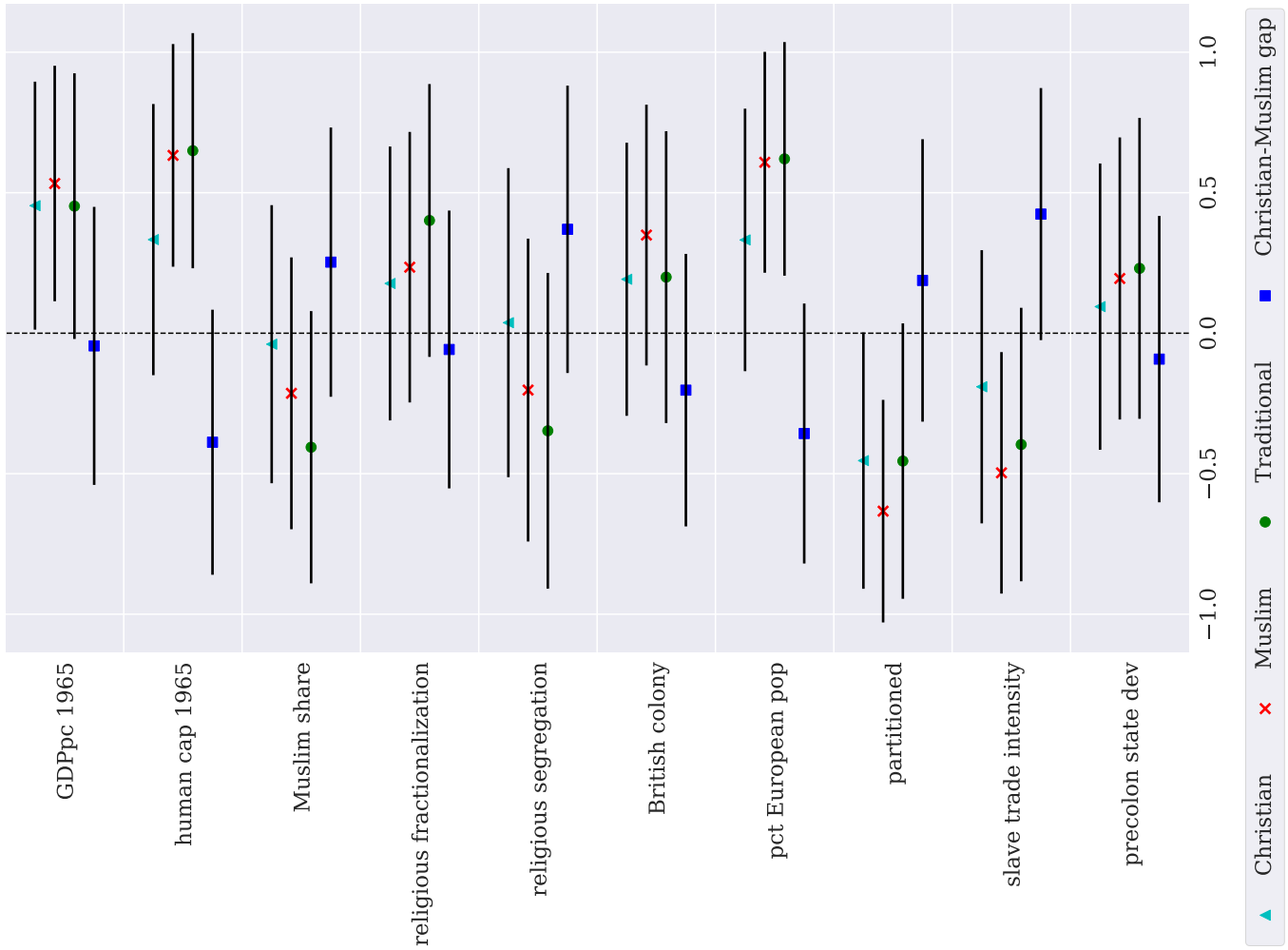
Intergenerational Mobility across Religious Lines

20 African Countries. individuals aged 14-18

	upward IM							downward IM						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
country	overall	Christian	Muslim	Traditional	$\Delta(c-m)$	N^{10+}_{dist}	$s(c>m)$	overall	Christian	Muslim	Traditional	$\Delta(c-m)$	N^{10+}_{dist}	$s(c>m)$
Botswana	0.798	0.822	0.556	0.699				0.085	0.083	0.027	0.076		1	0.0
South Africa	0.731	0.74	0.874	0.764		34.0	0.324	0.105	0.106	0.04	0.182		37	0.162
Egypt	0.673	0.679	0.673			187.0	0.775	0.052	0.048	0.052			186	0.634
Cameroon	0.613	0.739	0.424	0.481		113.0	0.867	0.056	0.042	0.196	0.185		107	0.738
Nigeria	0.612	0.786	0.466	0.229		6.0	0.667	0.096	0.078	0.162	0.0		7	0.143
Ghana	0.557	0.654	0.468	0.263		108.0	0.741	0.173	0.157	0.263	0.471		108	0.759
Togo	0.526	0.641	0.534	0.382		34.0	0.765	0.19	0.165	0.214	0.361		30	0.633
Zambia	0.439	0.446	0.484	0.449		6.0	0.5	0.253	0.25	0.221	0.262		6	0.667
Uganda	0.4	0.404	0.485	0.019		122.0	0.377	0.29	0.295	0.257	0.641		121	0.488
Benin	0.298	0.415	0.214	0.213		58.0	0.759	0.292	0.274	0.308	0.469		50	0.5
Mozambique	0.287	0.324	0.207	0.366		47.0	0.638	0.249	0.225	0.314	0.22		41	0.634
Mali	0.274	0.395	0.273	0.187		57.0	0.754	0.237	0.219	0.237	0.491		47	0.532
Sierra Leone	0.261	0.319	0.248	0.091		82.0	0.854	0.332	0.257	0.385	0.6		81	0.802
Senegal	0.244	0.527	0.235			22.0	1.0	0.264	0.163	0.274			22	0.773
Liberia	0.222	0.218	0.266	0.103		20.0	0.4	0.538	0.537	0.544	0.632		18	0.444
Burkina Faso	0.191	0.332	0.182	0.072		44.0	0.955	0.235	0.199	0.269	0.569		42	0.81
Guinea	0.182	0.229	0.181	0.138		14.0	0.929	0.439	0.5	0.418	0.724		14	0.286
Rwanda	0.181	0.183	0.274	0.077		21.0	0.238	0.543	0.541	0.489			19	0.632
Malawi	0.133	0.143	0.096	0.095		109.0	0.716	0.512	0.503	0.616	0.556		90	0.711
Ethiopia	0.116	0.138	0.082	0.017		58.0	0.759	0.344	0.323	0.481	0.8		52	0.731

Cross-Country Religious IM Correlates

Income, Religious Composition, and History



Cross-Country Correlates of Religious IM Gap

Correlations; [red] correlation religious gap; [blue] correlation with IM (all religions)

- **Income (GDP p.c.) and Education**
- Religious Fractionalization/Polarization
- **Religious Segregation** (Alesina and Zhuravskaya (AER 2011)
- Muslim Share
- Colonial Power Identity
- **European settlers share colonization** (Easterly and Levine (JEG 2016))
- **Slave Trade** (Nunn (QJE 2008))
- Broad African Regions
- **Ethnic Partitioning** (Alesina, et al. (JEEA 2011))
- Precolonial Political Centralization

Presentation Structure

1. **Introduction and Motivation**
2. **Data and Approach**
3. **Intergenerational Mobility (IM) across Religious Affiliation**
4. **Drivers of Educational Mobility across Religious Affiliation**
5. **Regional Childhood Exposure Effects vs Spatial Sorting**
6. **Mapping and Correlates of IM Religious Gaps**
7. **Discussion. Further Evidence**
8. **Conclusion**

Section Structure

1. **Approach and Specification**
2. **Inter-religious Differences**
   - Family/household structure
   - Industry/Occupation
3. **Drivers of Religious Educational Mobility**
   - Main Results
   - Gender Heterogeneity
   - Sensitivity

IM Differences across Religious Affiliation

Approach. Empirical Design

- **Specification (LS)**

$$\text{IM}^{rel}_{ibchdt} = \alpha_{cb} + \gamma_m Muslim + \gamma_a Animist + \delta_h H'_h + \theta_h I'_h + \phi_d + \epsilon_{ibchdt}. \quad (1)$$

1. H'_h: Household/family structure and characteristics
2. I'_h: Income/economic/occupational features
3. ϕ_d: Regional (inter. urban/rural) constants

Drivers of Religious IM Gap (Indiv. Level)

Hypotheses/Categories

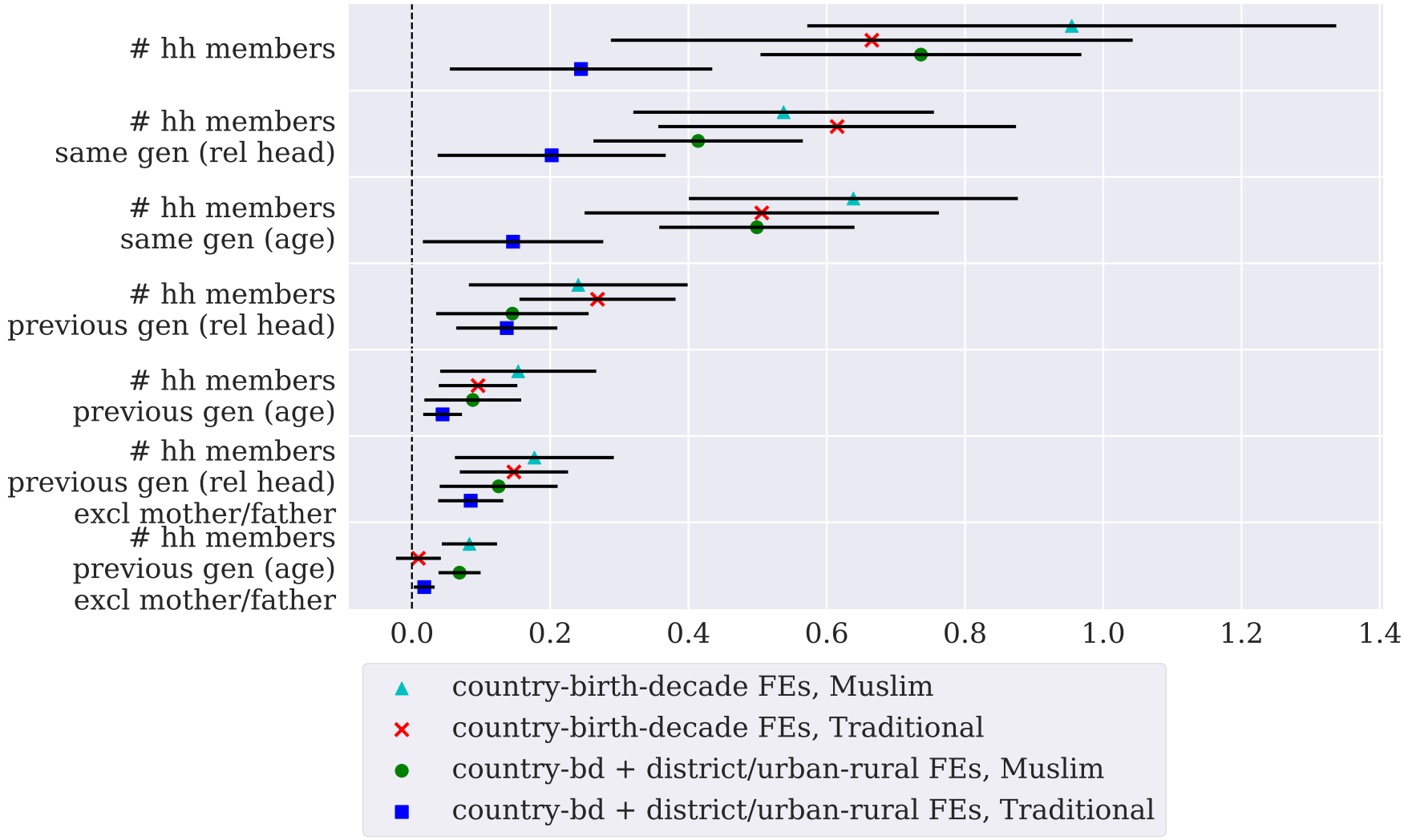
1. **Household/Family Characteristics**
   - Household Structure [multi-generational, number of hh members]
   - Family Arrangements [father only, mother only, father and mother only, mother/father/both and other relatives, only other relatives]
   - Relationship to household head [child, foster child, grandchild, sibling, spouse, other relative]
   - Previous generation age of birth and age of marriage [mother, father]

2. **Economic Traits**
   - Rural-Urban Household
   - Sector of Employment [household head and older generation]
   - Profession [household head and older generation]

3. **Regional Factors**
   - District X Urban Fixed Effects

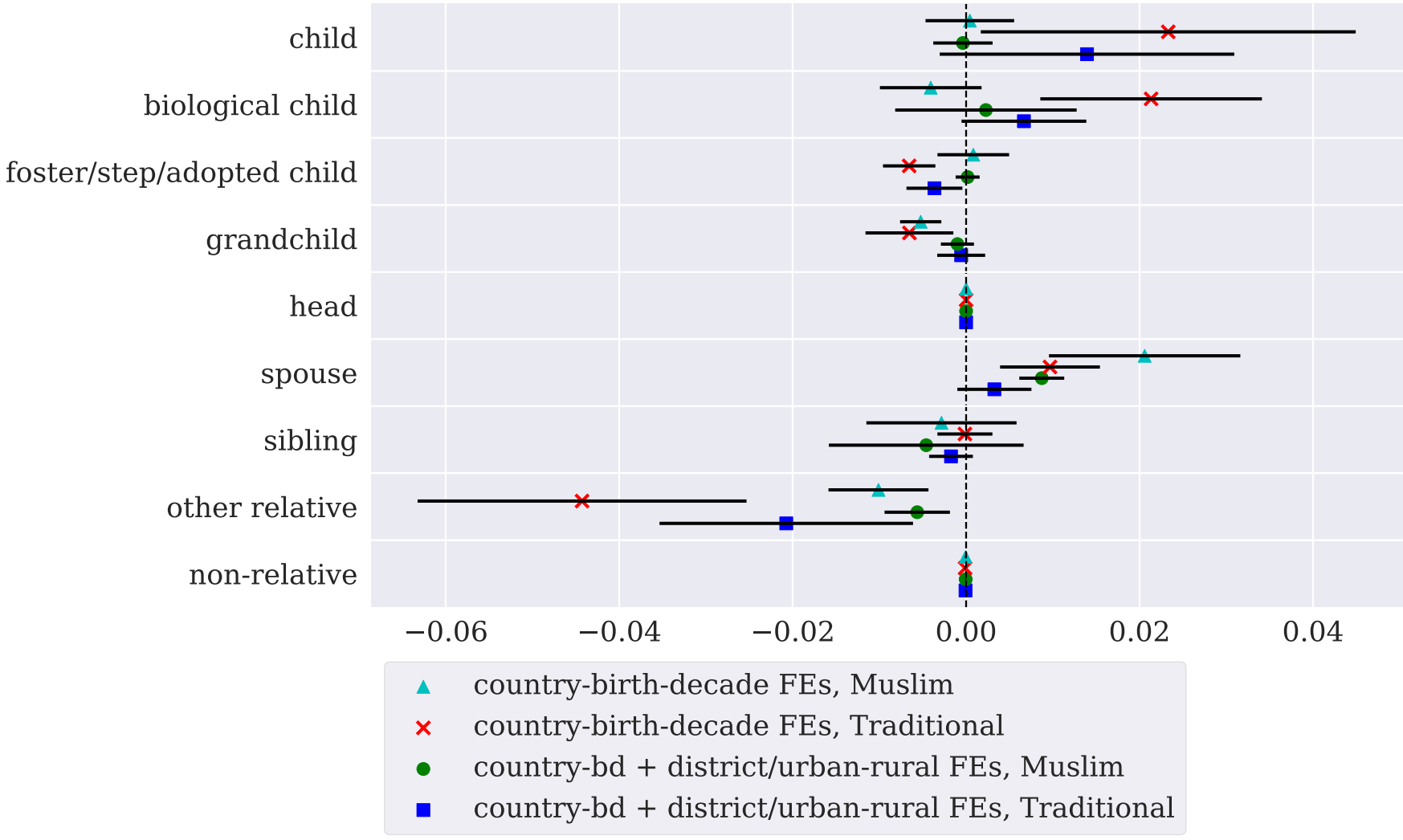
Differences. Household/Family Characteristics

Household Size



Differences. Household/Family Characteristics

Relationship to Household Head of 14-18 yo



Preliminary. Differences across Religious Affiliation

Household/Family Characteristics

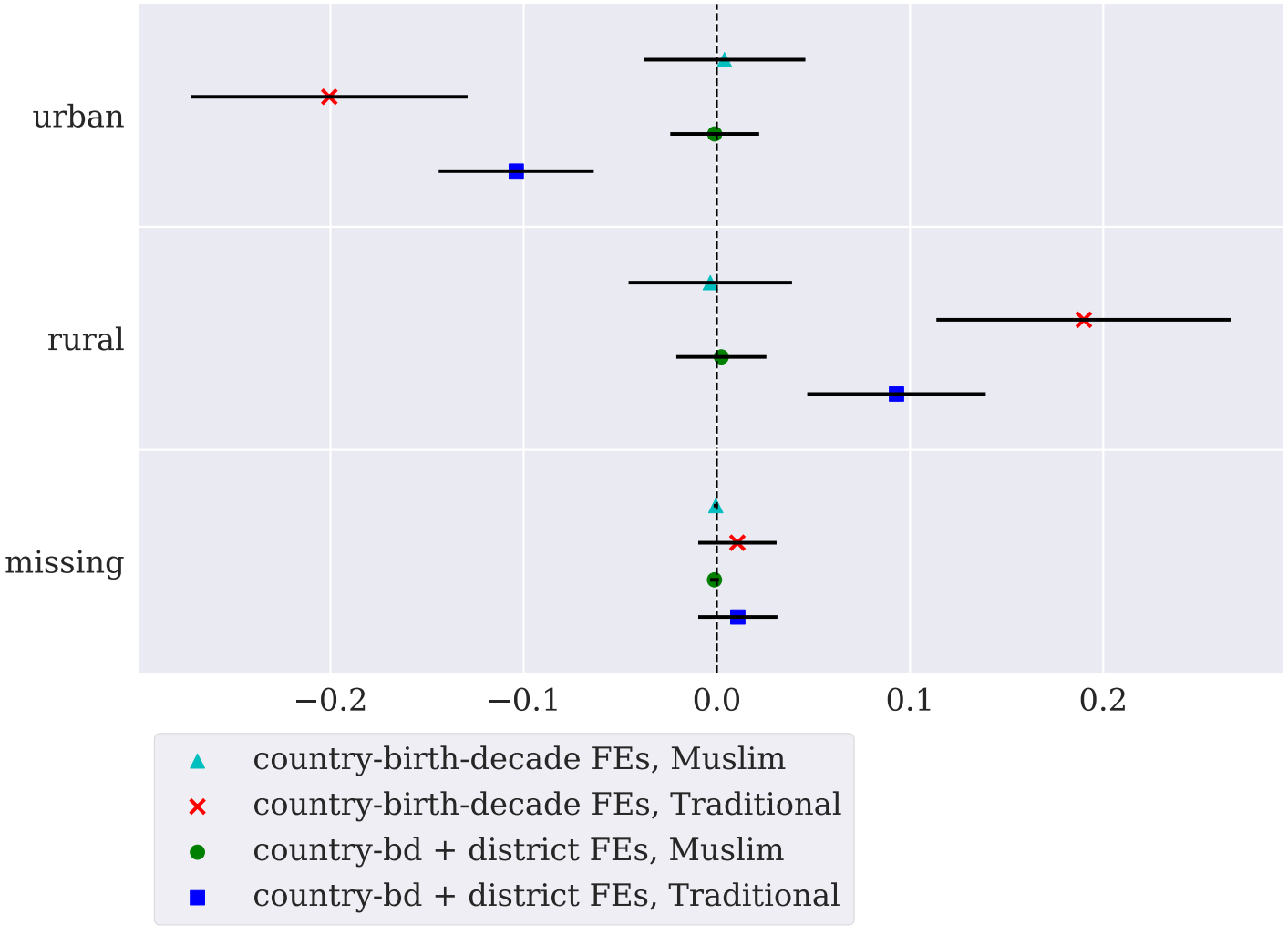
- **Household Structure**
  - Muslim and Traditional households are, on average, larger.
  - Muslim and Traditional households are more likely to be multi-generational (incl. grandparents).
  - Differences weaken, once we condition on regional constants

- **Relationship to household head**
  - Small differences across religious affiliation [child, foster child, grandchild, sibling, other relative]

- **Previous Generation Age of Birth**
  - Muslim and Animist marry earlier and give birth younger.
  - Differences weaken once we condition on regional constants

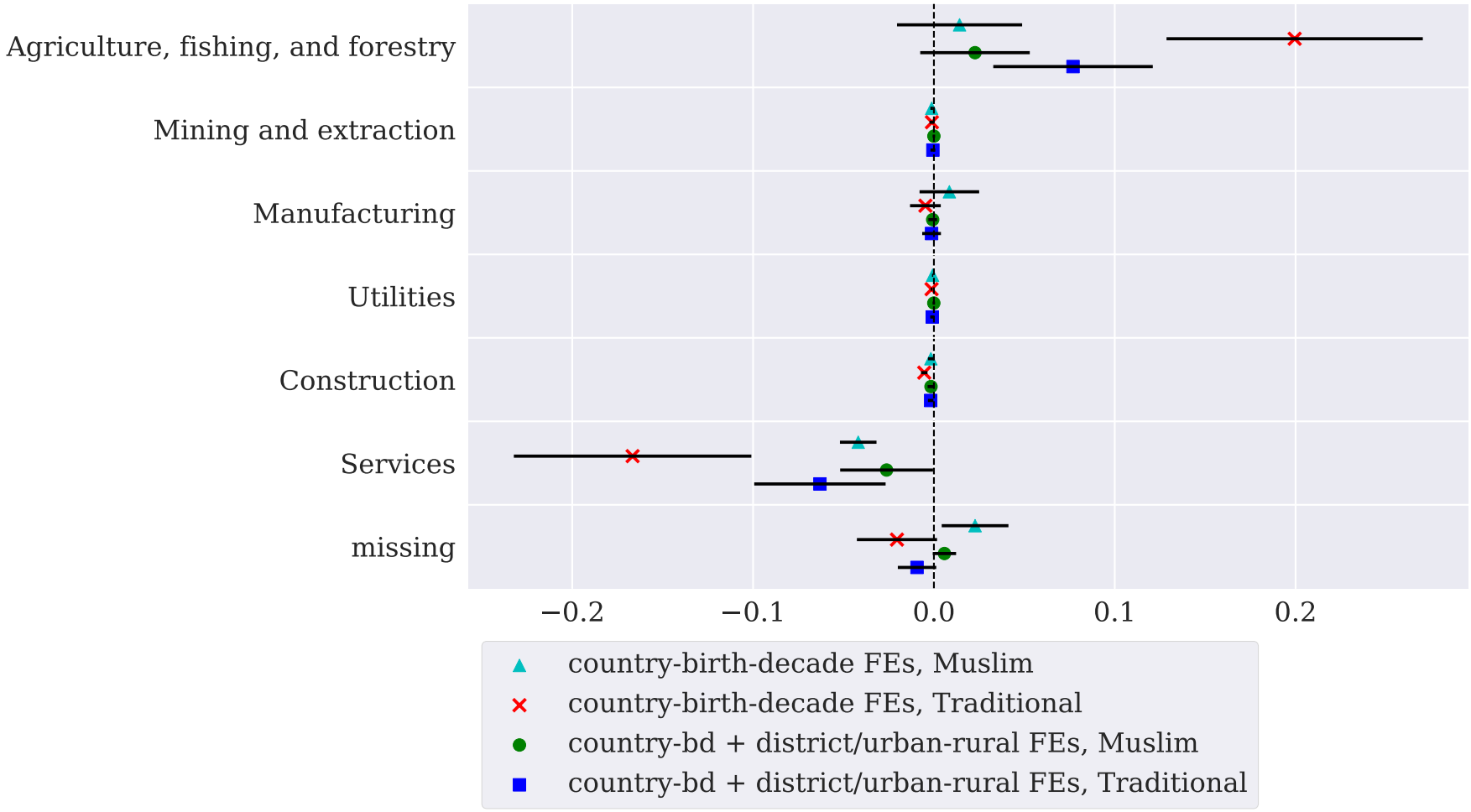
Economic Differences

Rural - Urban Residence



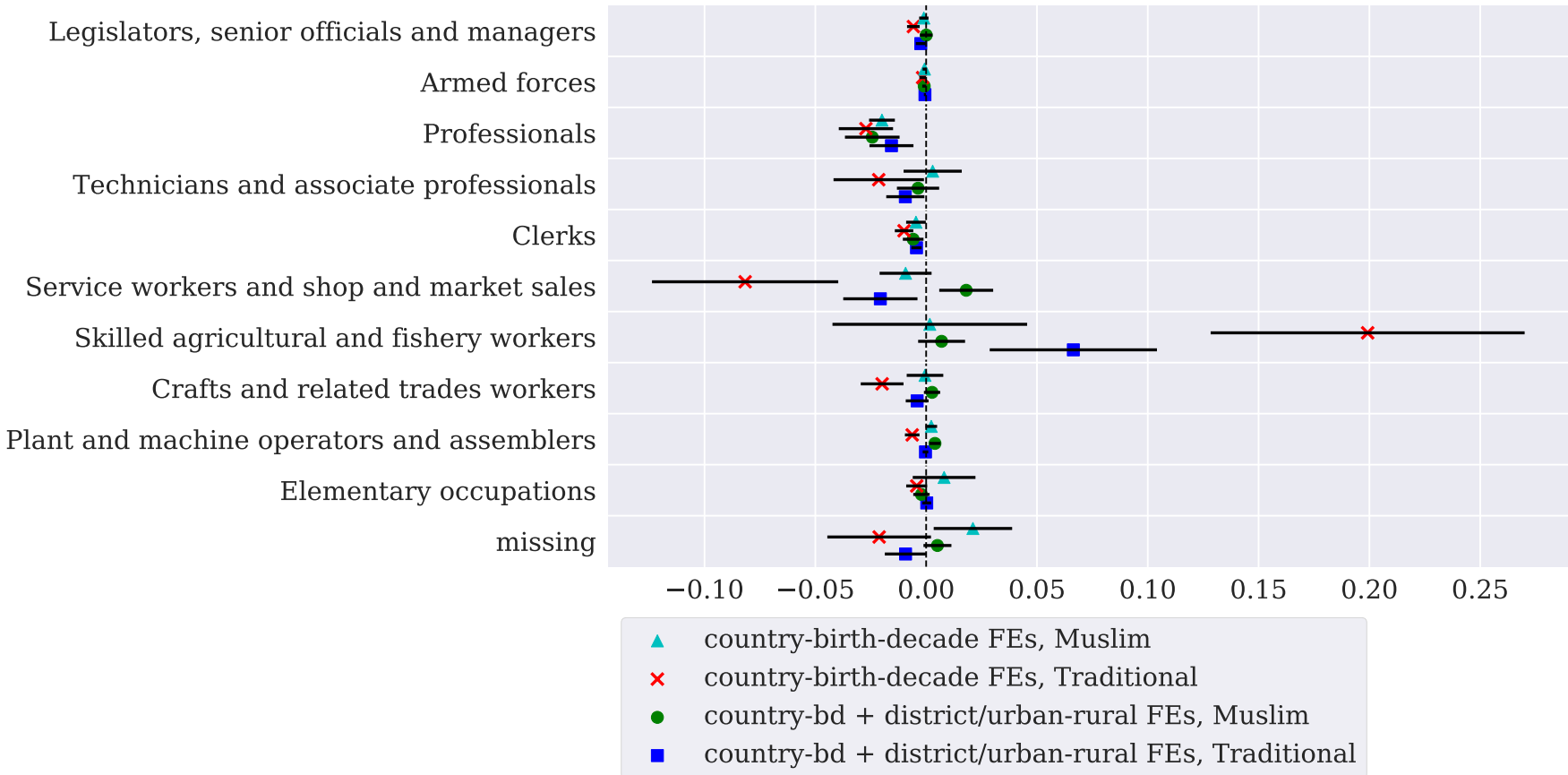
Economic Differences

Industry of Employment



Economic Differences

Occupation



Preliminary. Differences across Religious Affiliation

Income/Profession/Industry

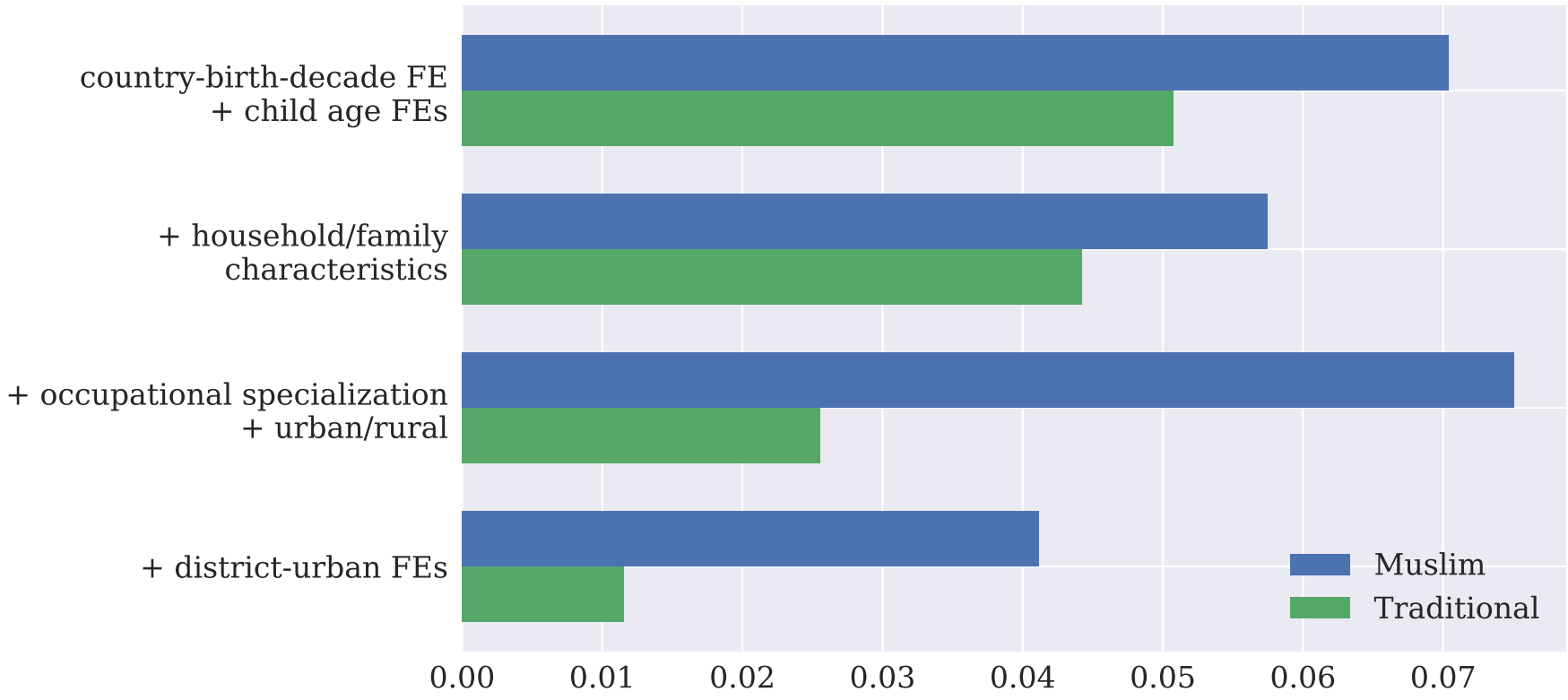
- **Rural-Urban Household**
  - No differences between Muslim and Christian households.
  - Animists 20% (10% with region constants) more likely rural.
- **Industry of Employment** Previous Generation
  - Muslims somewhat more likely to work in agriculture, 3%.
  - Animists more likely in agriculture, 20% (10%).
  - Muslims and esp. Traditionalists less likely in services (1% and 5%).
  - No differences in mining, manufacturing, construction, and utilities
- **Occupation** Previous Generation
  - no differences in most occupations
  - small differences in professionals (overall small percentage of the population), skilled agriculture and service workers
- **Further Evidence. Muslim - Christian Households**
  - No differences in household income [*Pew Research Centre*]
  - No differences in liv. conditions and household assets [*Afrobarometer*]

Drivers of Religious IM Gap

Upward IM Gap (Christian-Muslim and Christian-Animist)

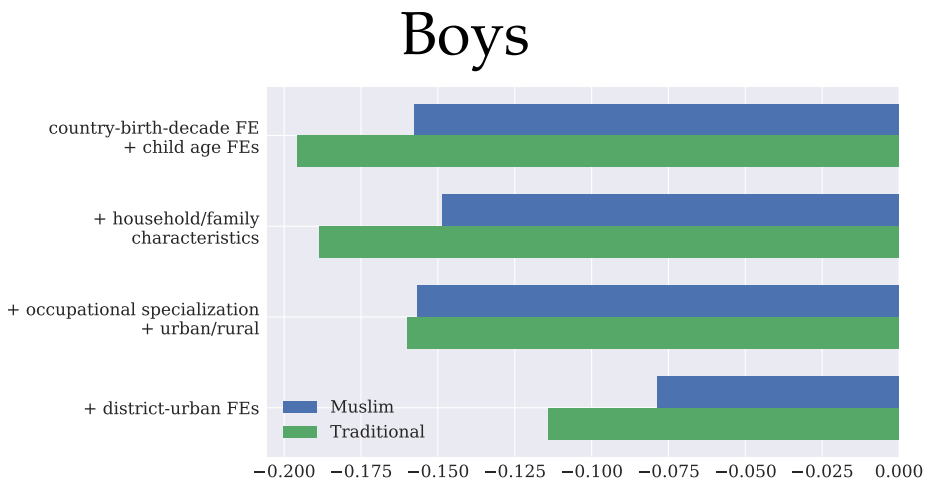
Drivers of Religious IM Gap

Downward IM Gap (Christian-Muslim and Christian-Animist)



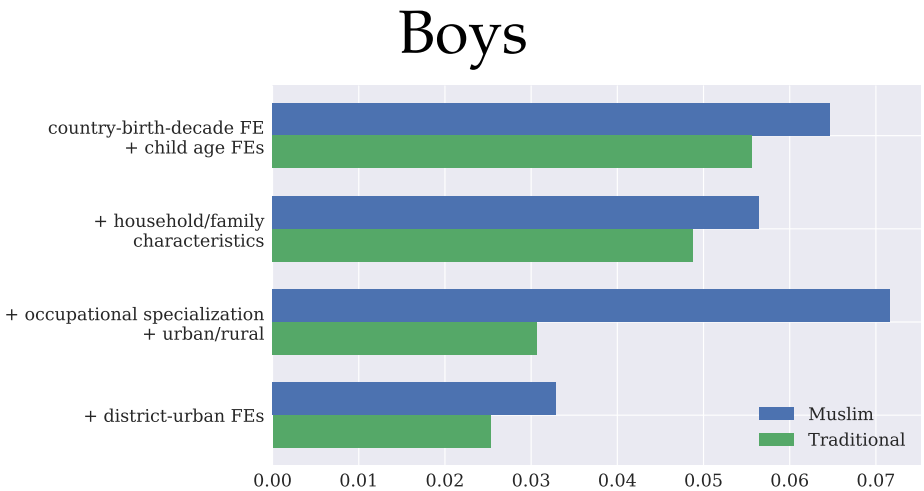
Drivers of Religious IM Gap, by Gender

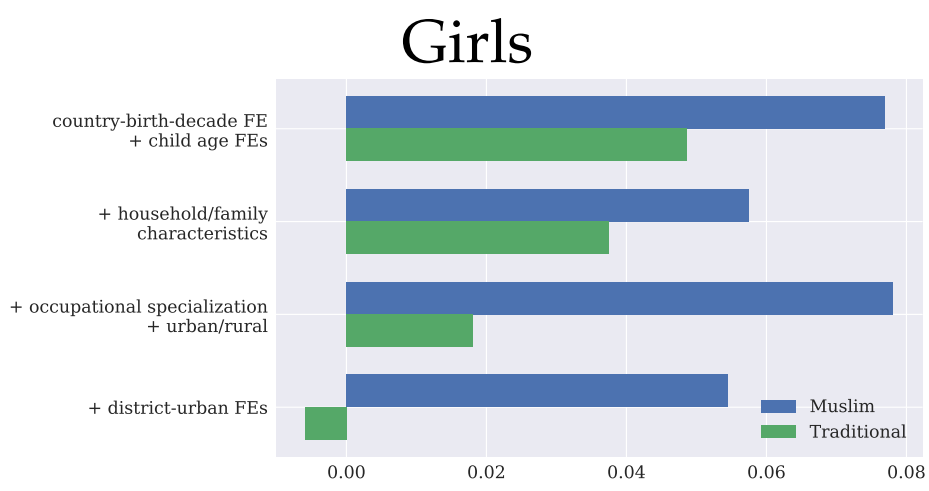
Upward IM Gap (Christian-Muslim and Christian-Animist)



Drivers of Religious IM Gap, by Gender

Downward IM Gap (Christian-Muslim and Christian-Animist)





Drivers of Religious IM Gap. Summary

Overall Patterns and Country Heterogeneity

1. **Household/Family Characteristics. Small-Moderate**
   - Overall small impact [about 10%]
   - Important for girls' downward IM
   - Somewhat larger role in West Africa

2. **Economic Features, No Role for C-M, modest role for C-A**
   - Small differences between Christians and Muslims on occupational specialization, industry of employment, and rural-urban status.
     - *No differences in income [Pew Research Center (2008)] and no differences in living conditions [Afrobarometer (all rounds)]*
   - Christian-Animist Gap. Some power

3. **Regional Factors. Country Heterogeneity**
   - Fixed-effects explain roughly half of religious IM gap
   - Biggest role in **Nigeria, Benin, Ghana, Cameroon, and Senegal** [countries with religious segregation (more to come)]

Drivers of Religious IM Gap. Further Evidence

Further Evidence and Sensitivity Analysis

1. Accounting for ethnic affiliation [non-negligible within-ethnicity variation in religion]
2. Looking only at biological children
3. Alternative conditioning sets
4. Dropping regions with relatively low cohabitation rates
5. Expanding sample, 14-25 years old (sample doubles but cohabitation drops)

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Regional Childhood Exposure Effects and Selection

Section Structure

1. **Methodology**. Chetty and Hendren (2018a)
2. **Semi-Parametric Estimates**. Regional Childhood Exposure Effects and Sorting by Religious Affiliation
3. **Further Evidence**

Methodology. Chetty and Hendren (2018a)

Approach

Method: **Look on moving young individuals (children) who**

- live outside their birth region (as recorded by the Census)
- for whom time of residence in the current region is observed
- have moved to current region of residence between age 1 and 18
- are children of illiterate parents [upward IM]

Test: **If regions matter for schooling, children, whose families move earlier in the formative-for-schooling age, should be affected the most**

Methodology. Chetty and Hendren (2018a), cont.

Semi-Parametric Estimation, allowing for Religion-Specific Slopes (Chetty et al. (2020))

1. Construct **average IM gap** for each origin-destination pair, (a) all non-movers (nm); (b) non-movers of the same religion (r)

$$\Delta^{r}_{odb} = \widehat{\text{IM}}^{r}\_\text{up}^{\text{nm}}_{bd} - \widehat{\text{IM}}^{r}\_\text{up}^{\text{nm}}_{bo},$$

2. **Estimate**

$$\text{IM\_up}^{r}_{ibmcod} = [\psi_h +]\ \alpha_{ob} + \alpha_m + \sum_{m=1}^{18} \beta^{r}_{m} \times \mathbb{I}(m_i = m) \times \Delta_{odb}$$

$$+ \sum_{b=b_0}^{B} \kappa_b \times \mathbb{I}(b_i = b) \times \Delta_{odb} \ + \epsilon_{i,ibmcod}.$$

3. **Plot religion-specific childhood regional exposure effects by age, $\hat{\beta}^{r}_{m}$.**

Methodology. Chetty and Hendren (2018a), cont.

Migration Data

- Most censuses (14 out of 20 countries) record individuals' **birth regions**: either admin-1 or admin-2
- **migrant** : individual who lives outside his or her birth region
- For 13 out of 20 countries we also observe **since when** individuals resident in current location
- Countries: Benin, Cameroon, Egypt, Ethiopia, Ghana, Guinea, Mali, Malawi, Rwanda, Uganda, South Africa, Zambia, Togo

$\Rightarrow$ **exploit timing of children age when households move**

Methodology. Chetty and Hendren (2018a), cont.

Further Evidence. Alesina, Hohmann, Michalopoulos, and Papaioannou (ECMA 2021)

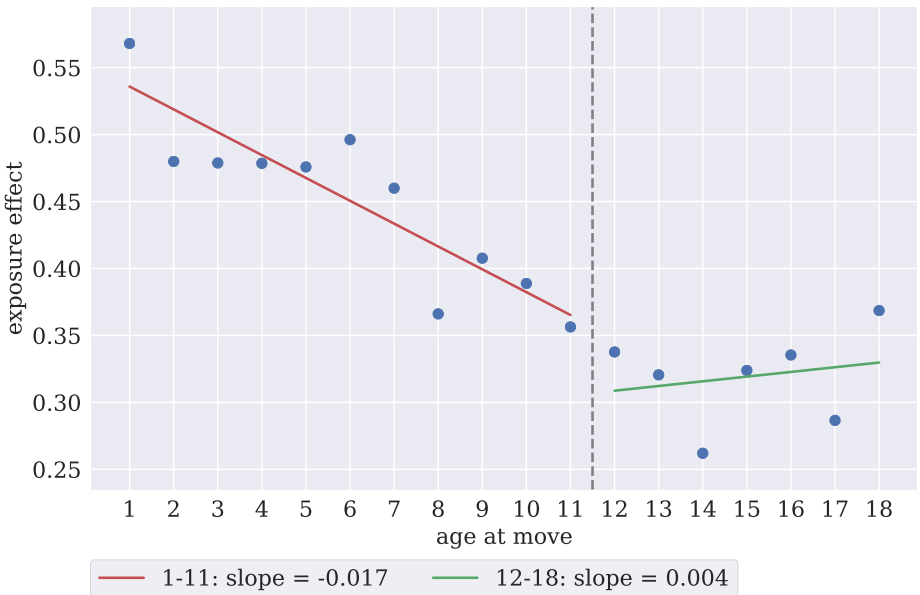
1. **Household Fixed-Effects Specification**. Compare Siblings; account for family unobserved features.
   - selection turns insignificant (and close to 0)
   - regional exposure effects during childhood very similar

2. **Endogeneity**. Push Shocks and and Pull Factors
   - Push Shocks. Years of abnormal outflows
   - Pull Factors: shift - share using past migration
   - Pull Shocks and Push factors: similar estimates (both exposure effects and sorting)

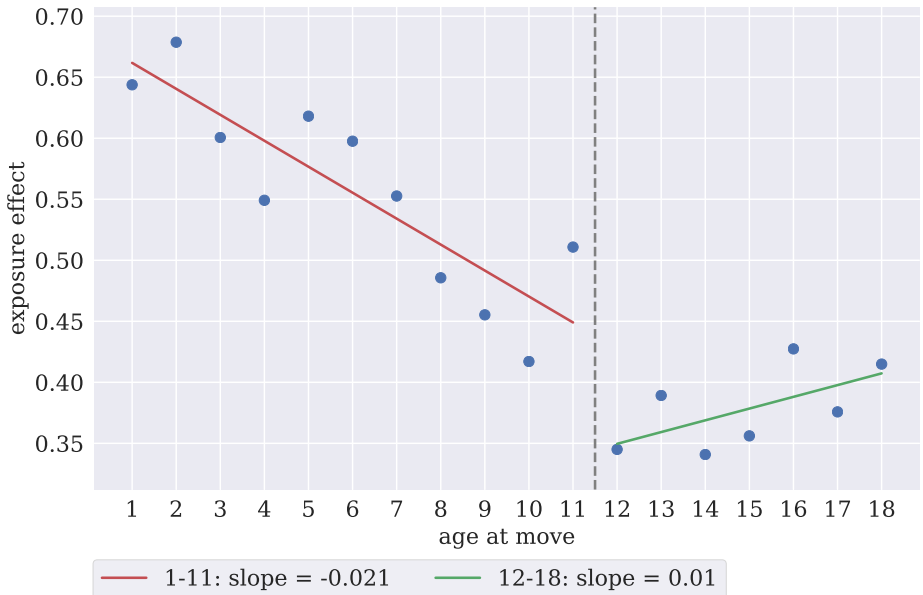
Childhood Regional Exposure Effects and Selection

Christians and Muslims. Overall Destination-Origin Differences in IM

Christians. 1.7%; Selection 0.30



Muslims. 2.1%; Selection 0.40



Regional Effects on IM across Religious Lines

Parametric Estimates for **Females**

Table: Parametric Estimates Regional Childhood Exposure by Religion for Girls, overall Δ_{odb}, including multigenerational households

Dependent Variable:	upward IM					
	Christian		Muslim		Traditional	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
exposure ages 1-11	0.0263***	0.0242**	0.0285***	0.0389***	0.0108	0.0077
	(0.0048)	(0.0098)	(0.0074)	(0.0149)	(0.0185)	(0.0537)
exposure ages 12-18	0.0028	0.0047	-0.0073	-0.0021	-0.0420	-0.1712***
	(0.0093)	(0.0103)	(0.0164)	(0.0171)	(0.0315)	(0.0496)
Fixed-effects						
birth-decade	Yes	Yes	Yes	Yes	Yes	Yes
age-at-migration	Yes	Yes	Yes	Yes	Yes	Yes
household	No	Yes	No	Yes	No	Yes
Fit statistics						
Observations	69,925	69,925	55,475	55,475	3,618	3,618
R^2	0.15718	0.91456	0.18266	0.93378	0.19369	0.93478
Within R^2	0.14044	0.01196	0.1246	0.00503	0.1545	0.04236

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Regional Effects on IM across Religious Lines

Parametric Estimates for **Males**

Table: Parametric Estimates Regional Childhood Exposure Effect by Religion for Boys, overall Δ_{odb}

Dependent Variable:	upward IM					
	Christian		Muslim		Traditional	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
exposure ages 1-11	0.0166***	0.0264***	0.0070	0.0097	0.0132	0.0158
	(0.0045)	(0.0080)	(0.0071)	(0.0093)	(0.0186)	(0.0467)
exposure ages 12-18	-0.0026	0.0125	-0.0078	-0.0070	0.0194	-0.0958
	(0.0069)	(0.0122)	(0.0268)	(0.0127)	(0.0345)	(0.0633)
Fixed-effects						
birth-decade	Yes	Yes	Yes	Yes	Yes	Yes
age-at-migration	Yes	Yes	Yes	Yes	Yes	Yes
household	No	Yes	No	Yes	No	Yes
Fit statistics						
Observations	69,130	69,130	62,882	62,882	3,371	3,371
R^2	0.10822	0.88227	0.08328	0.88014	0.15302	0.90214
Within R^2	0.09815	0.0086	0.06507	0.00174	0.11357	0.03072

Regional Effects vs Sorting. Summary

Takeways

1. **regional childhood exposure effects for all religions**.
   - also within-household variation
   - also parametric specifications
2. **sizable spatial sorting for both Christians and Muslims** (and Animists)
3. **stronger regional childhood exposure effects for girls, esp. Muslim**
   - gain/lose the most from early moves to high/low mobility regions

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8. **Conclusion**

Correlates of Religious IM (Gap)

Section Structure

1. Mapping Religious IM Gaps across African Regions
2. Differences in Residence across Religious Affiliation
3. Correlates of Religious IM
4. Correlates of Religious IM Gap
5. Taking Stock. Further Evidence

Correlates of Regional IM across Religion

Objectives

1. **Characterize regional IM across religious affiliations**
   - Commonalities and differences across religious groups
2. **Explain Regional Educational Gaps**
   - at independence conditions, regional development
   - geography-location
   - colonization and precolonial features

Correlates of Regional IM across Religion

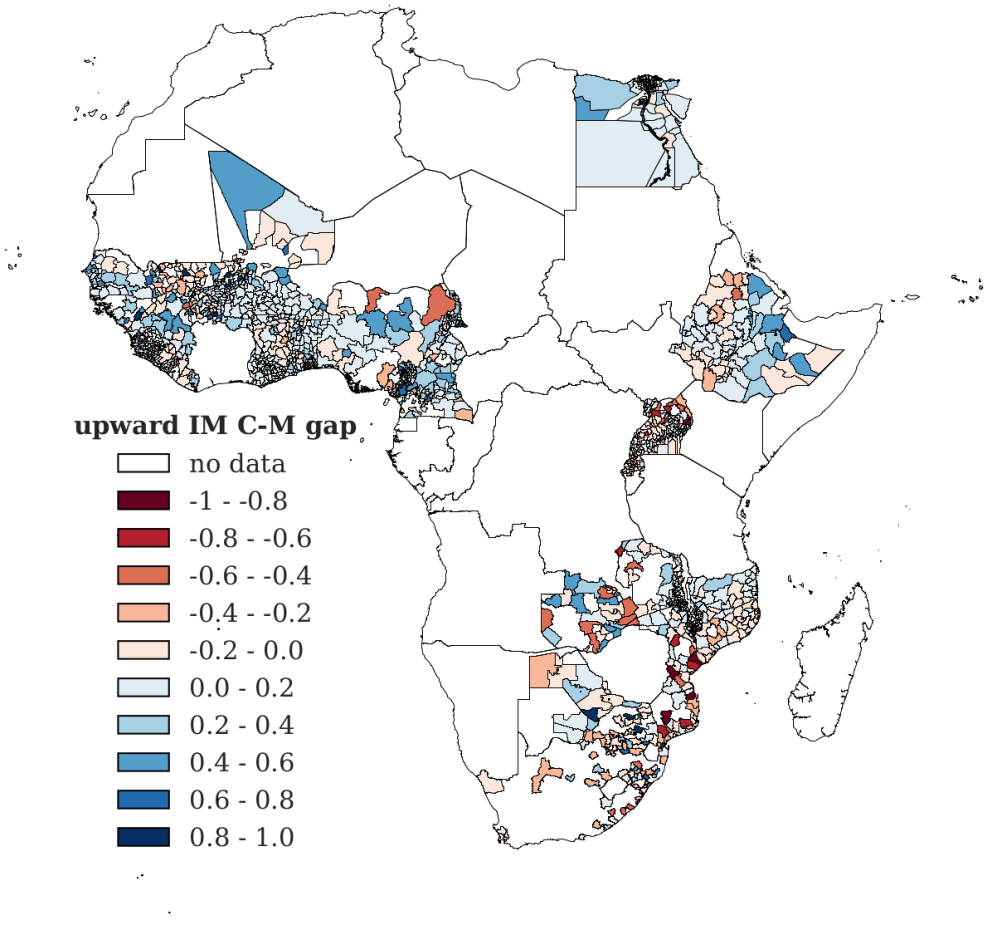
Caveats

- **Non-causal estimates**
  - Non random assignment
  - Error-in-variables
- **Objective to characterize religious IM across African regions**
  - Building on Alesina et al. (ECMA 2021)
  - Chetty, et al. (QJE 2014, QJE 2018b, 2021) in the US
  - Asher, Novosad, and Rafkin (2020) in India

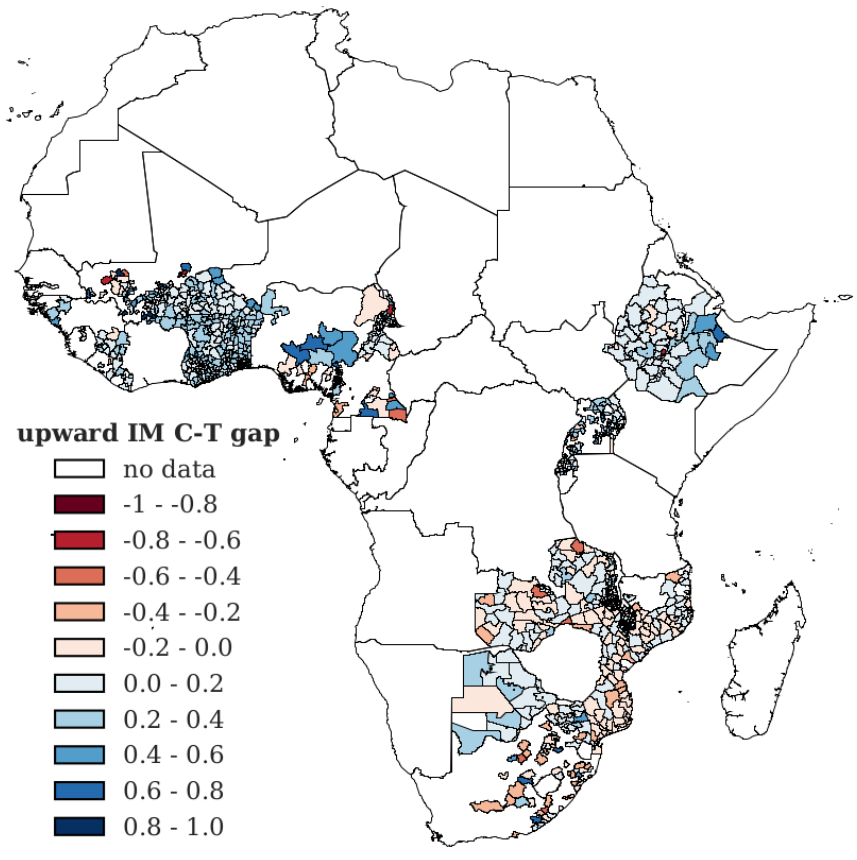
Religious IM Gaps across African Regions

Christian-Muslim Gap and Christian-Animist Gap in Upward IM

Christian-Muslim



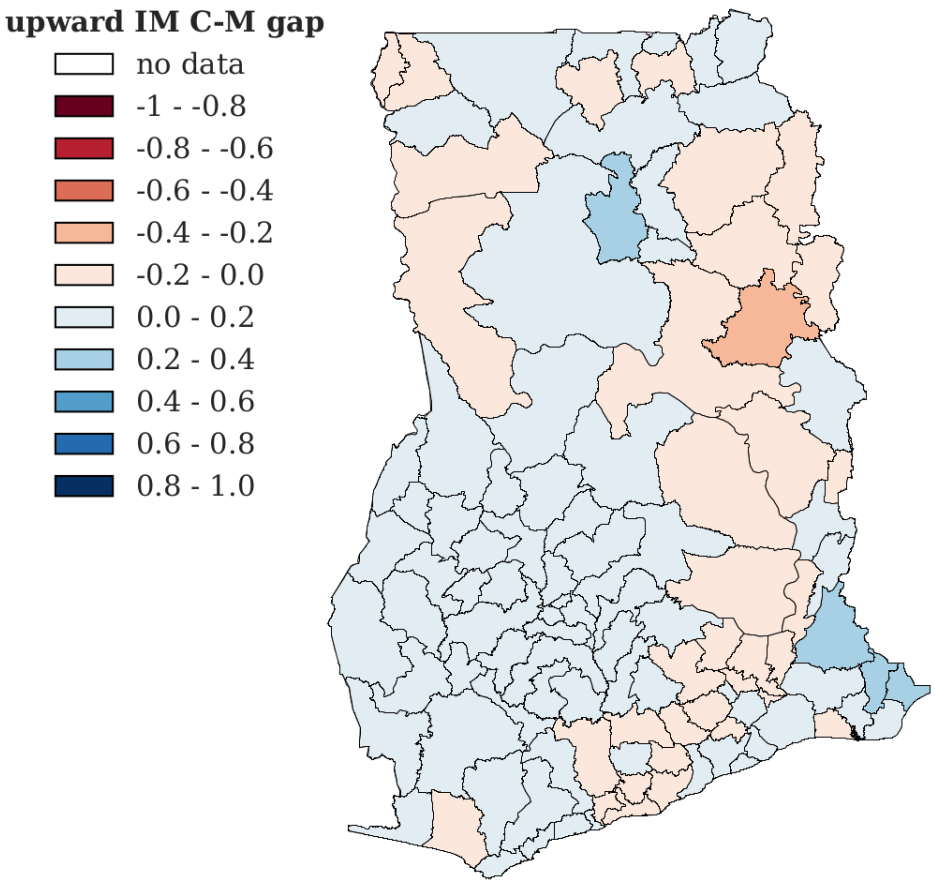
Christian-Animist



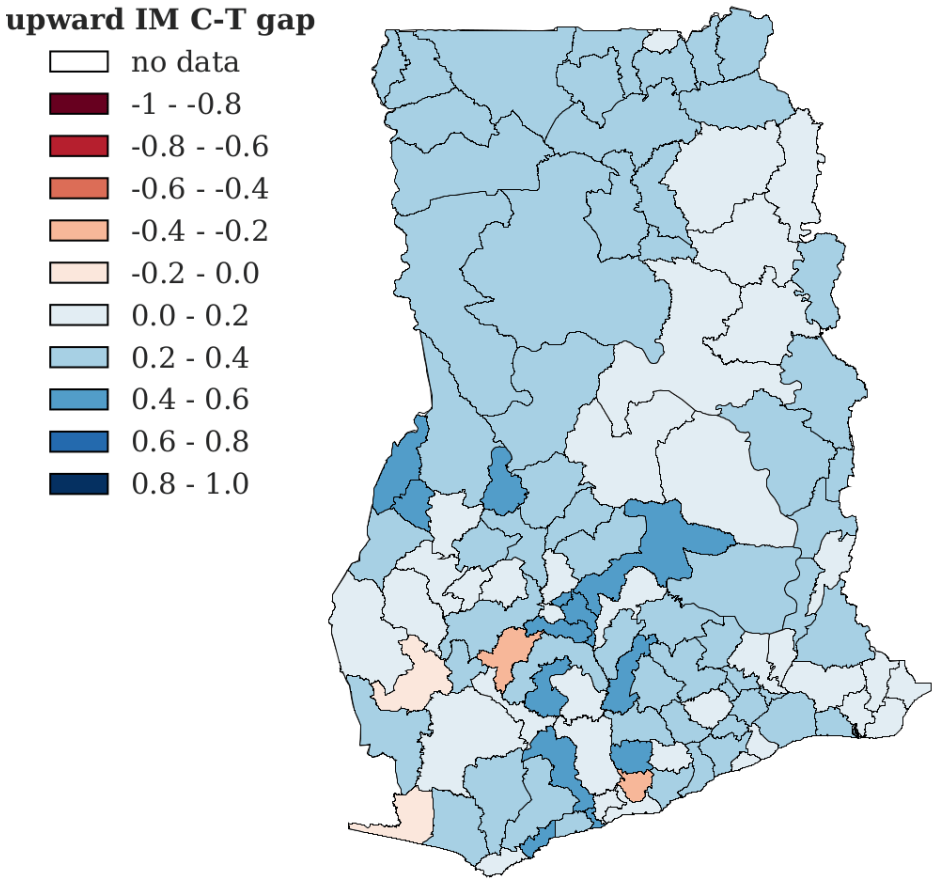
Example. Ghana. Religious IM Gaps

Christian-Muslim Gap and Christian-Animist Gap in Upward IM. Min 10 obs

Christian-Muslim



Christian-Animist



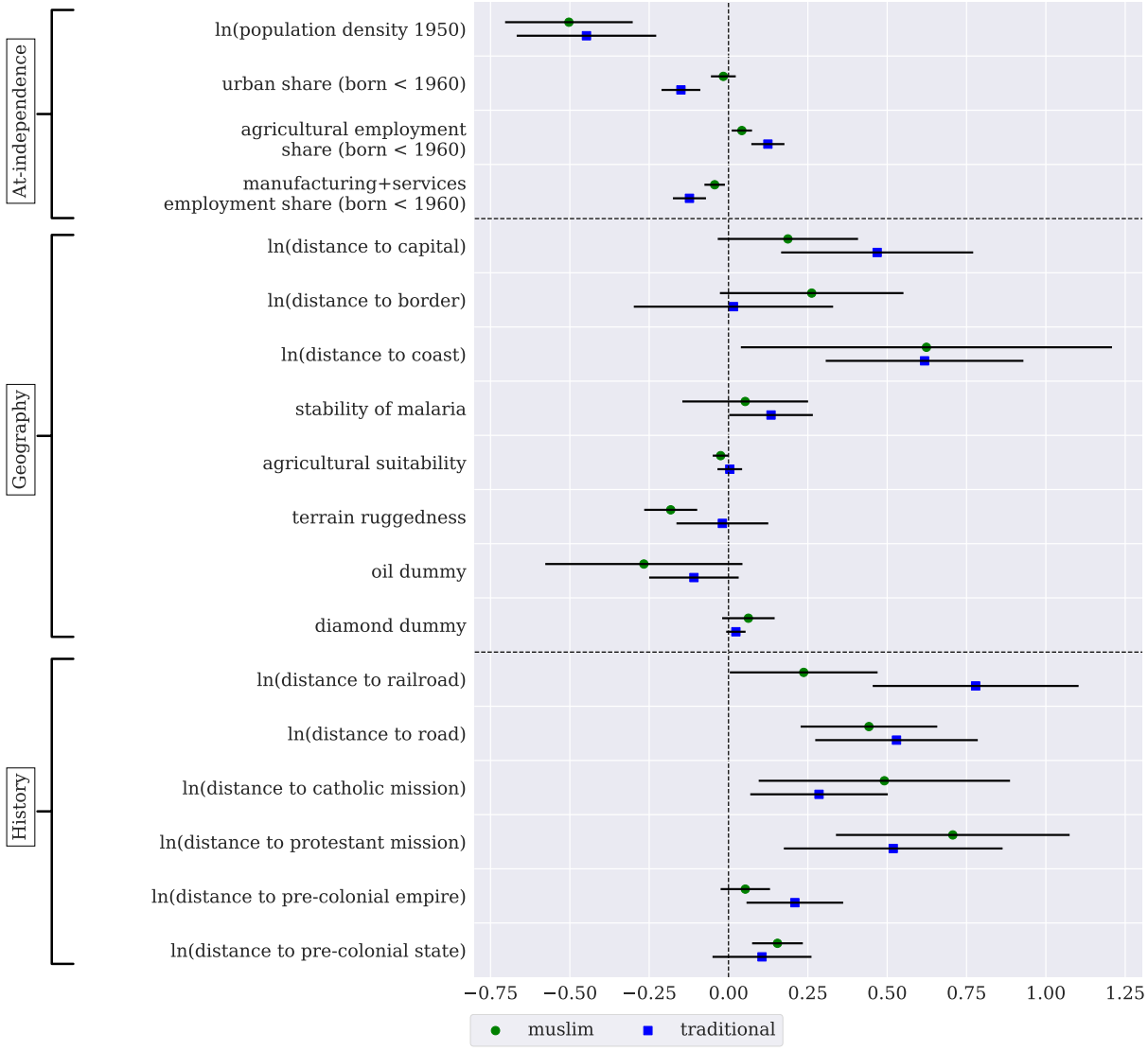
Correlates of Regional IM across Religion

Aspects, Variables (Alesina et al. (2021), motivated by Historical Development Lit.)

- **Geography**
  - distance to capital, border, coast
  - agricultural suitability
  - stability of malaria transmission
  - terrain ruggedness
  - presence of oil field, diamond mine
- **Colonial and pre-colonial variables**
  - distance to colonial rail-roads & roads
  - distance to Protestant and Catholic missions
  - distance to pre-colonial empires/states
- **At-independence, (mostly) from individuals born up to 1960**
  - population density in 1950 & urban share
  - industry labour shares

Preliminary Evidence. Residence Differences

Individual Level Population-Weighted LS Estimates



Preliminary Evidence. Residence Differences, cont.

Summary

1. **Muslims reside in less developed regions**
   - less densely populated, less oriented in services and manufacturing
   - further away from the capital and from the coast
   - further away from colonial roads, railroads, and Christian missions (providing education)
2. **Animists reside in even less developed and more remote from the capitals and coastline regions**

Correlates of Religious IM and Religious Gaps

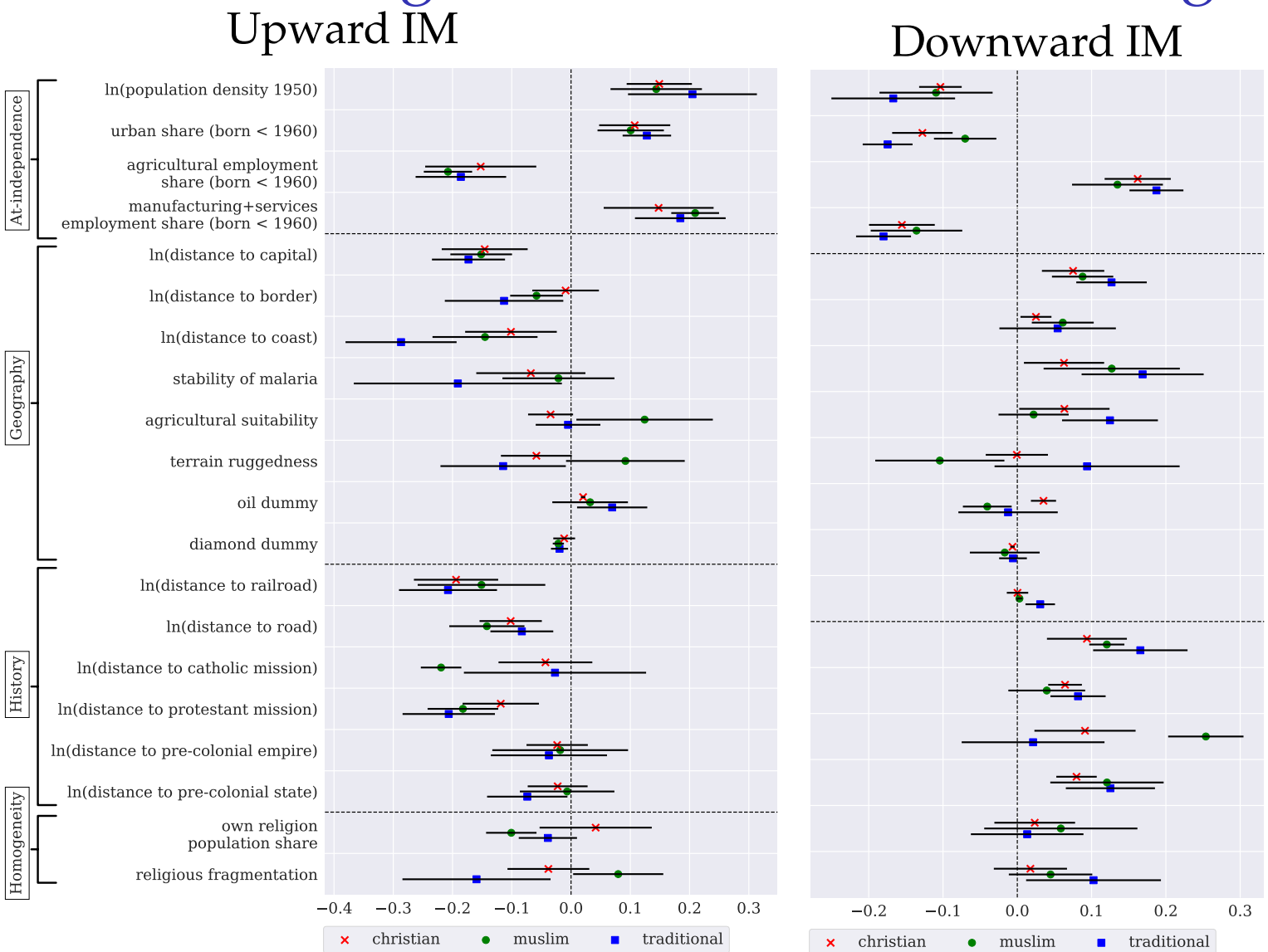
Within Country LS Specifications

- Regress IM of individual i of religious affiliation g born in birth-cohort b observed in census-year t in country c on fixed effects...
- at-independence development (D), location-geographic features (G, and historical aspects (H); **religion specific slopes**
- ... also conditional also on stock of education at the parental religion-region-cohort level (significant) $\widehat{\mathrm{E}}^{o}_{c,g,b,r}$ (share of parents with completed primary education)

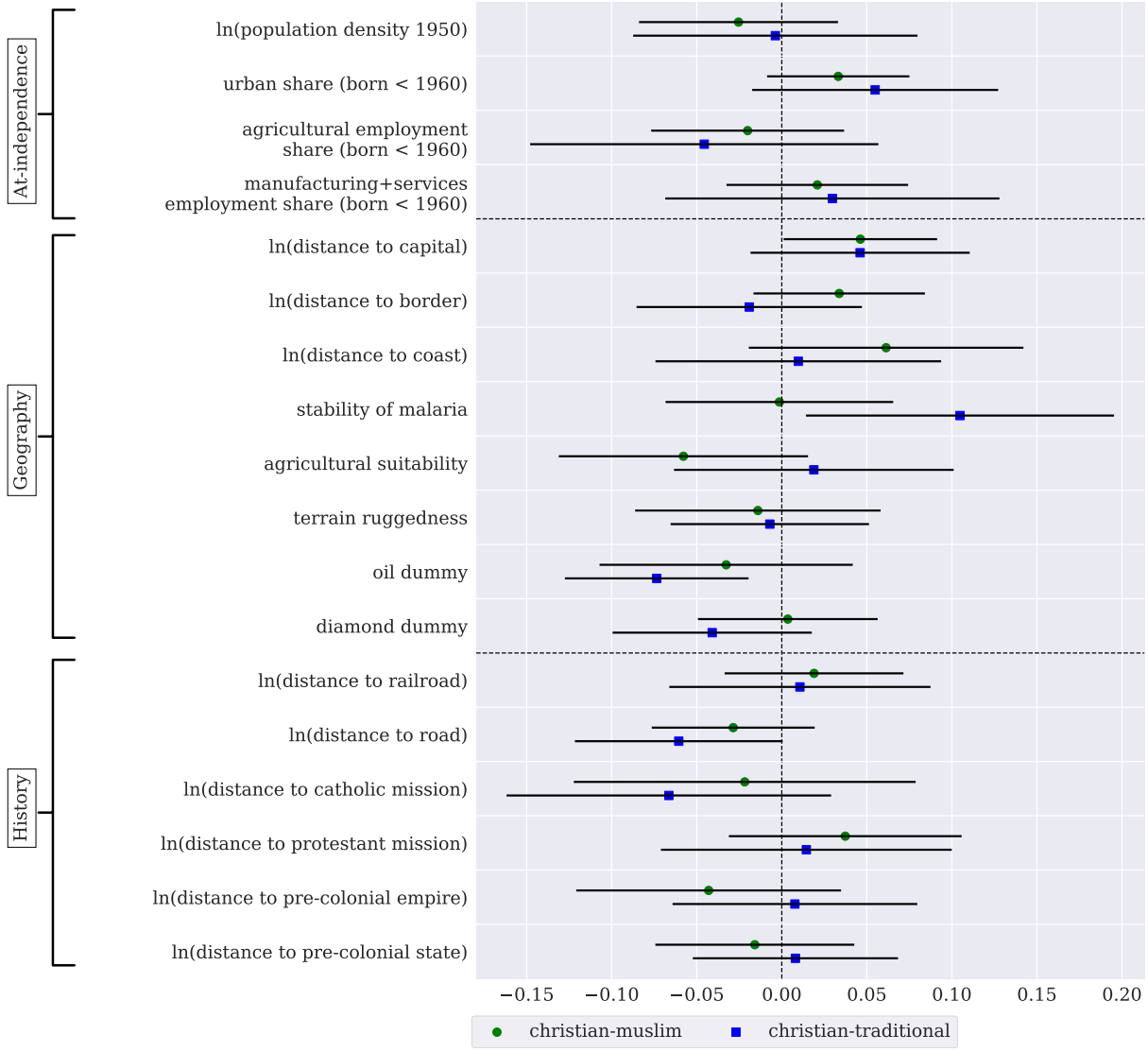
$$\mathrm{IM}^{up-down}_{i,c,g,t,b,r} = \gamma_c + \gamma_b + \gamma_t + \phi_1 D_{g,c} + \phi_2 G_{g,c} + \phi_3 H_{g,c} \ \ [+\lambda \widehat{\mathrm{E}}^{o}_{c,g,b}] + \epsilon_{i,c,g,t,b}$$

- also consider specification with province constants
- similar results when pooling across regions-groups-cohorts

Correlates of Religious IM across African Regions



Correlates of Regional Religious IM Gap



Taking Stock. Religious IM Gaps across Regions

Summary

- **Muslims and Animists reside in less developed, with relatively unfavorable location-geography regions**
- **Correlation between regional features** (at-independence development, good geography-location, and early colonial investments) **and IM equally strong for Muslims, Christians, and Animists** [not causal]
- **Regional features uncorrelated with religious IM gaps**

Religious IM across Regions

Open Question

Which regional features explain the considerable IM gaps?

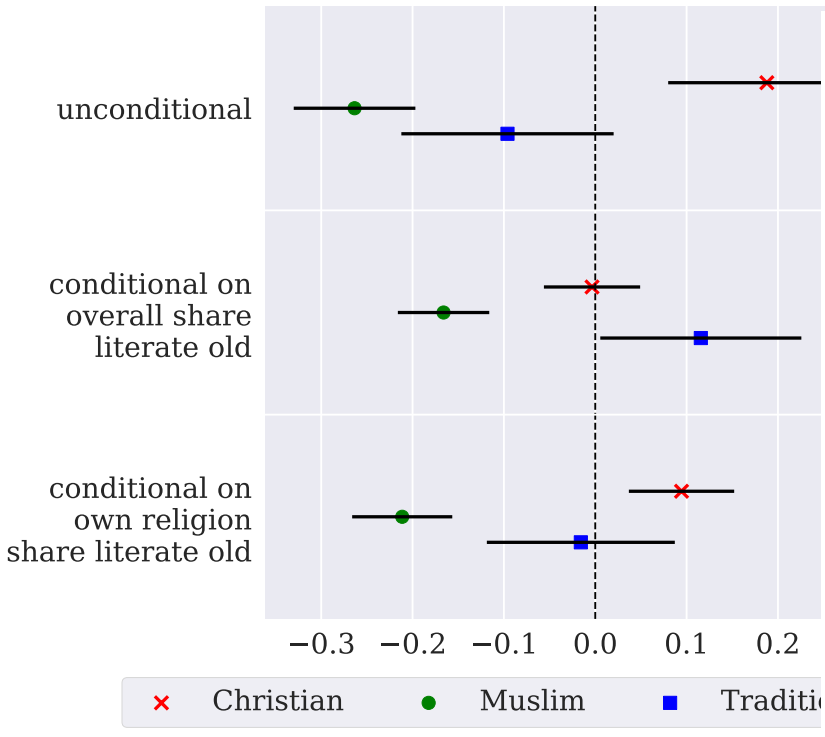
Segregation

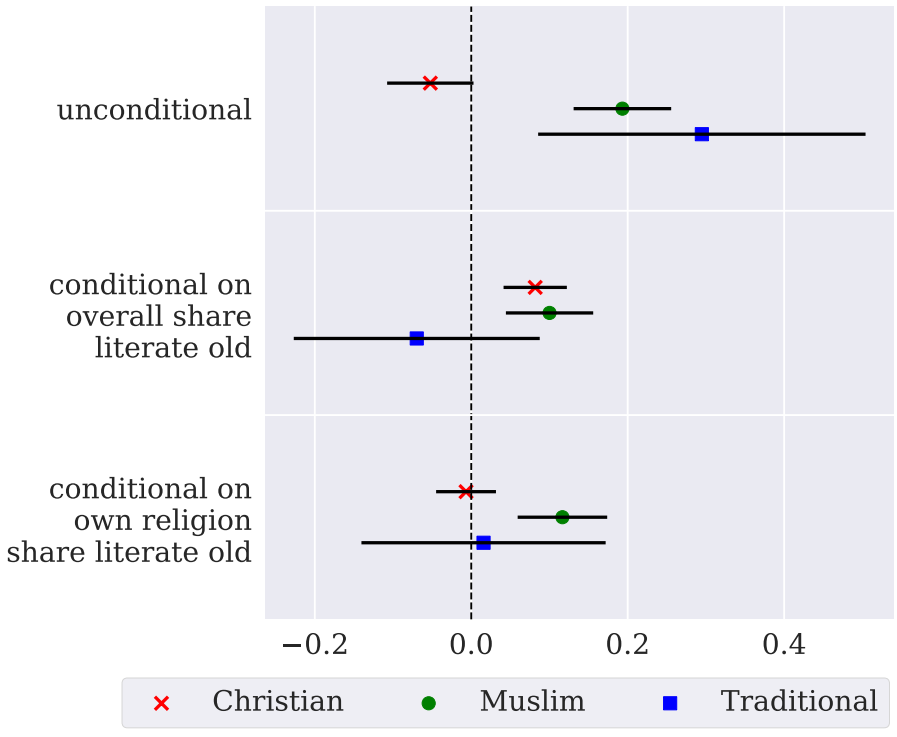
Cultural Spillovers. Religious Capital

- **Religious Segregation and religion IM gaps across countries**
- **Ethnic-Race Minorities, Segregation, and Education-Income in the US (ghettos)** [e.g., Cutler and Glaeser (QJE 1997, 1999), Cutler et al. (JUE 2008)]
- **Spillovers?**
- **Test. Regional Specifications Regress IM on own religion share, cond. on country (province) fixed effects and share of illiterate in the district by religion**
  - Do Muslims and Animists fare worse in areas where they are minorities? [minority discrimination]
  - How about Christians?

Religious IM across Regions and Own Share

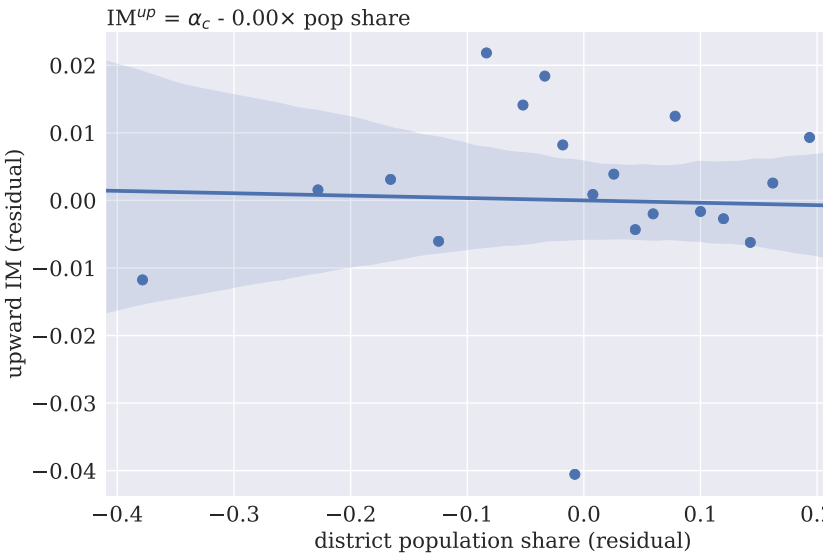
Muslims. Upward IM (left panel) and Downward IM (right panel)

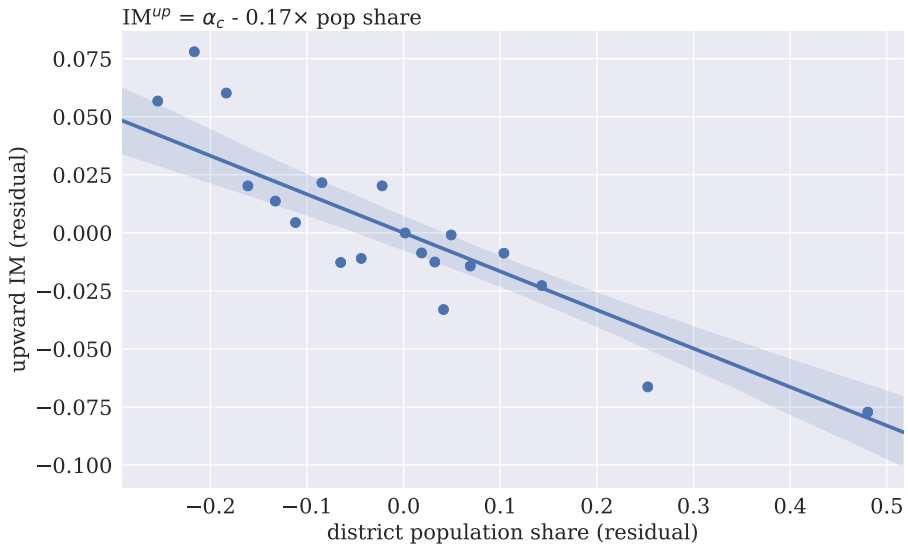




Religious IM across Regions and Own Share

Bin Scatters Upward IM Christians (left panel) and Muslims (right panel)





Religious IM across African Regions and Own Religion Share, cont.

Summary

- **Muslims fare worse in regions where they are majorities or significant minorities** [also Platas Izama (2018)]
  - In line with US evidence on segregation and ghettos
- For Animists small and statistically insignificant correlation between IM and own religion share
- Christians, if anything, do somewhat better in regions with a high own religion share [unstable, weak correlations]

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Summary

Evidence so far

1. **Muslims and Animists reside in less developed regions** (lower upward IM)

2. **Correlations between regional features** (favorable geography, early investments, and at-independence development) **and IM similar for Muslims, Animists, and Christians**

3. **Regions matter equally for female Africans of all religious denominations; less for male Muslims**

4. **Muslims fare worse (lower upward IM and higher downward IM) in regions where they form the majority or are a significant minority**; this is not the same for Christians and Animists

Why?

Further Evidence. Moving to Opportunity

Internal Migration across Religious Affiliation

- **Moving to Opportunity Literature**.
  - United States. Chetty et al. (2014, 2019, 2020, 2021)
  - Africa. Alesina et al. (2021); for all religious groups
- **Internal Migration Literature**
  - Review. Lagakos (JEP 2020)
  - Examples. Bryan et al. (2018), Bryan and Morten (2018), Tombe and Zhu (2019)

Further Evidence. Moving to Opportunity, cont.

Internal Migration across Religious Affiliation

- **Migration**, cond. on birth region and birth-cohort
- **Preferences** [Afrobarometer Surveys]
  - Proximity to Co-Religionists
  - Religious group membership

Afrobarometer Survey Evidence

Sample

- Nationally representative surveys of voting-age individuals (random enumeration area selection)
- Various rounds with geo-referenced data (sounds 3-7) beliefs, trust, attitudes, corruption perception, education, religion

Afrobarometer. Preferences for Religious Segregation

Question.

For each of the following types of people, please tell me whether you would like having people of a different religion as neighbors.

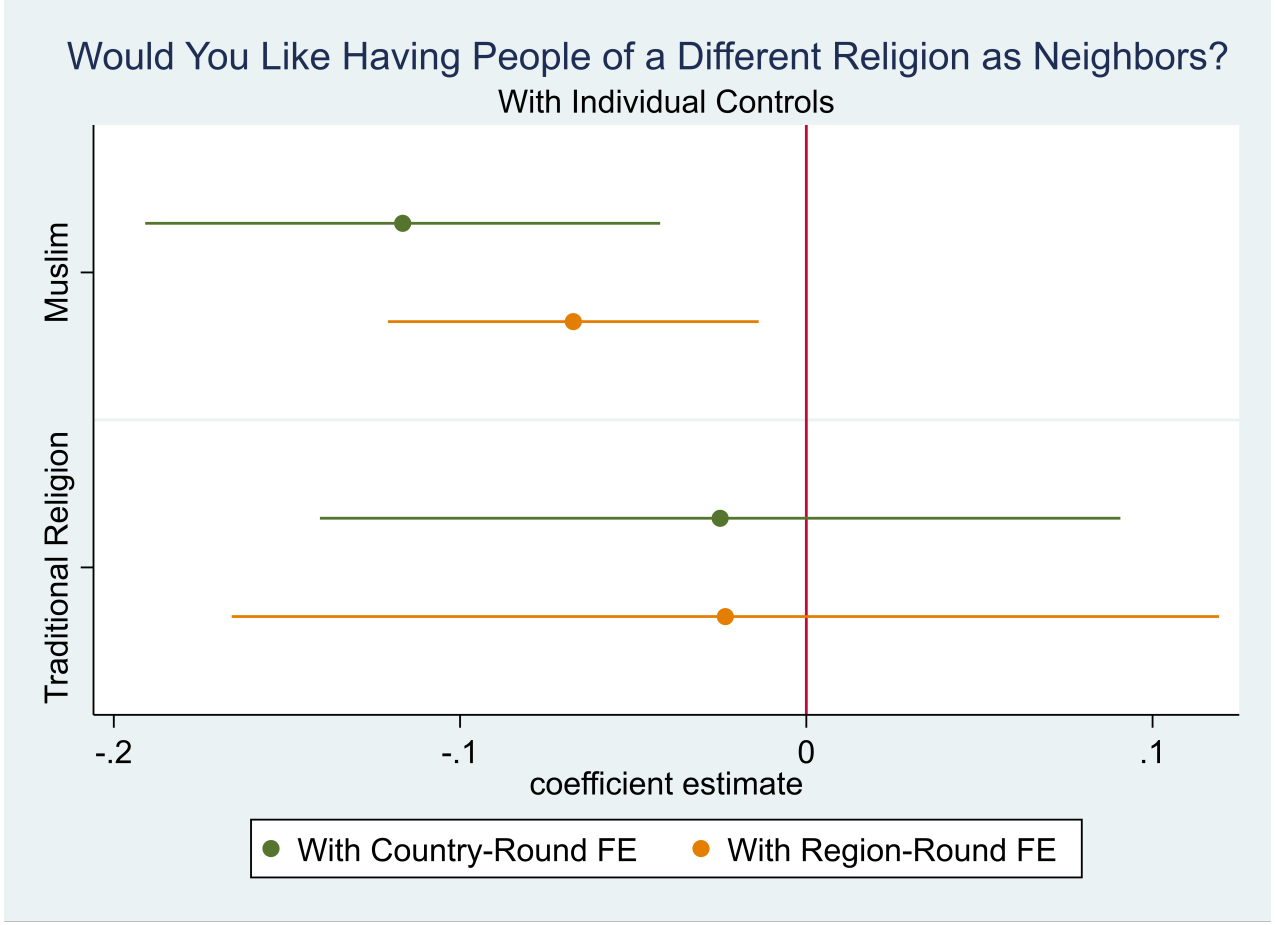
1. Strongly dislike
2. Somewhat dislike
3. Do not care
4. Somewhat like
5. Strongly like

Sample

- Rounds 6 (2016) and 7 (2019)
- 35 countries
- 28,392 Muslims; 57,080 Christians; 1,359 Animists

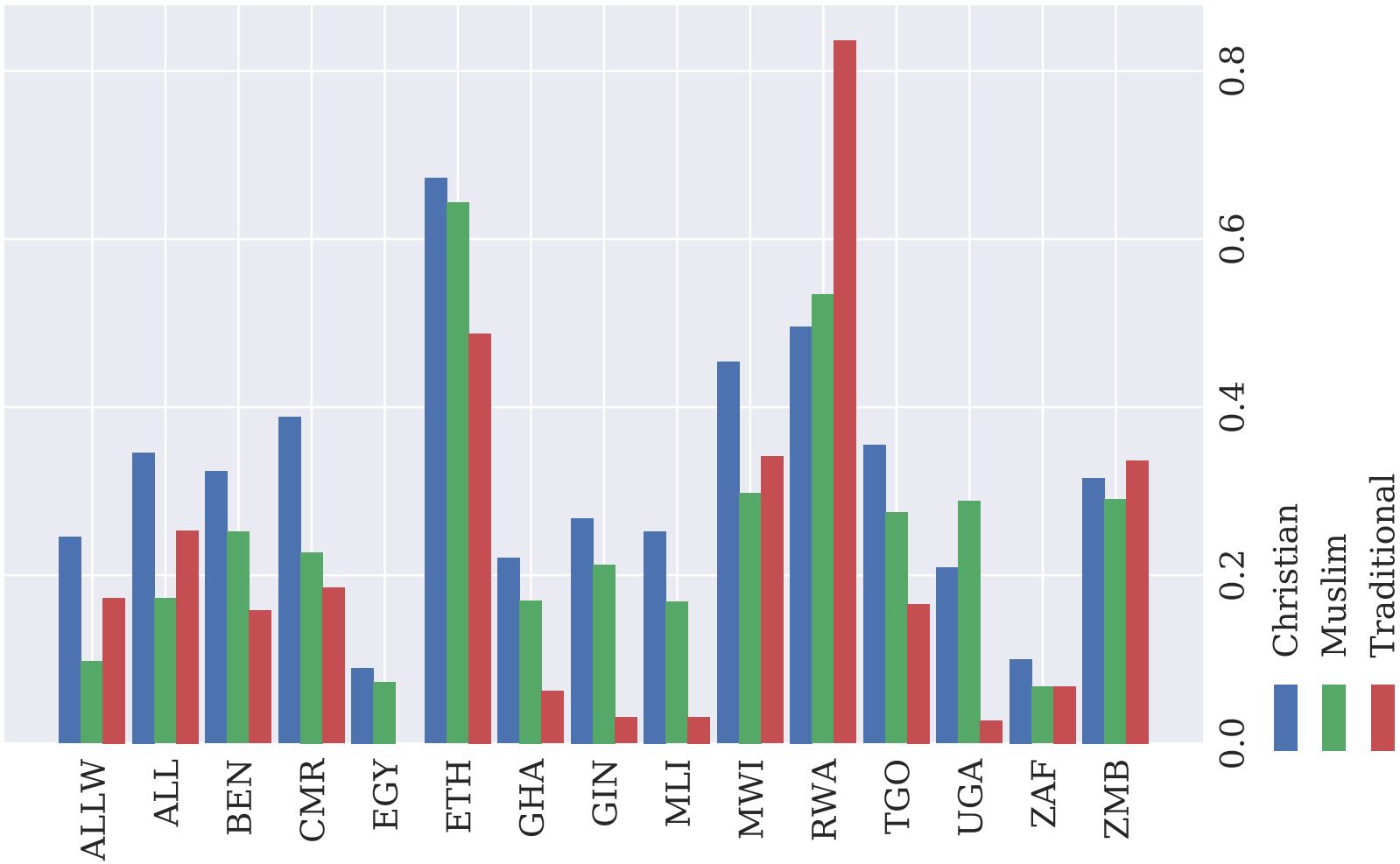
Afrobarometer. Religious Segregation Preferences

OLS Estimates. All Individuals



Out Migration across Religious Affiliation

IPUMS. All individuals



Where to Go From Here?

Questions

1. **Unpack Religious Segregation.** Experimental Evidence
2. **Role of Religious Education**. Curriculum, provision; views on secular education
3. **Differential Returns to Education across Religious Lines**
4. **Perceived Returns to Education across Religious Lines**
5. **Religious Networks**; labor markets and culture; religious networks and educational investments **substitutes of complements?**
6. **Risk-Sharing**; Formal and Informal Credit Markets - Zakat 77% of Muslims and Tithe 72% of Christians

Presentation Structure

1. **Introduction and Motivation**
2. **Data and Approach**
3. **Intergenerational Mobility (IM) across Religious Affiliation**
4. **Mapping and Correlates of IM Religious Gaps**
5. **Regional Childhood Exposure Effects vs Spatial Sorting**
6. **Discussion**
7. **Conclusion**

Conclusion. Results Summary

Educational Religious Upward and Downward IM across across African Countries and Regions

1. **New IM Measures of Religious IM across African Countries and Regions**
   - absolute upward IM and absolute downward IM for Muslims, Animists, and Christians across countries and regions
   - Considerable Religious IM Gaps (Christian - Muslims/Animists)
2. **Drivers Religious IM gaps Individual Level**
   - Household/Family Characteristics. Small-Moderate
   - Economic Features. No Role
   - Regional Factors. Big Role (Segregation)

Conclusion. Results Summary, cont.

Educational Religious Upward and Downward IM across across African Countries and Regions

3. **Correlates Religious IM (and Gaps) across Regions**
   - At-independence development, colonial investments, and god location-geography matter for IM, equally for all religious groups
   - Geography, development, and history do not correlate with the regional religious IM gap
   - Muslims and Animists reside in lower development and with worse geography regions
   - Muslims fare worse where they are large minorities or majorities; not the case for Animists; if anything, positive for Christians

4. **Regional Childhood Exposure Effects vs Selection**
   - Similar regional exposure effects across religion
   - somewhat stronger for Muslims, esp. girls
   - Sizable spatial sorting for all religions

Future Work

Questions

1. **Intra-religion Differences.** Christian, Orthodox, Protestant; Sufi, Suni, Ahmadiya
2. **Unbundle Religion.** Institutions, Norms, Beliefs, Religious Leaders
3. **Religious Education Role**. Curriculum, provision
4. **Religious competition**
5. Religion, Education, and Conflict
6. **Regional Policies and Religious Representation**
7. **Unpack Religious Segregation.** Experimental Evidence
8. **Differential Returns to Education across Religious Lines**
9. **Perceived Returns to Education across Religious Lines**
10. **Religious Networks**; labor markets and culture