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The big picture

> Religion since 1900. Census data. Surveys.

Economic rivalry between religions.

Smith and competition.

New economics of religion.

Club goods.

Platform model.

Principles.

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The Economics of Religious Competition Toulouse School of Economics, MRes Semester II, February/March 2024

Paul Seabright

February 9, 2024



For a non-technical introduction, see....

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https://press.princeton.edu/books/hardcover/9780691133003/the-divine-economy



At the Assemblies of God in Accra, Ghana



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Worshippers thronging to place offerings in the collection at a Revival week service of the Assemblies of God in Accra, Ghana

Shortly after this the choir sang hymn whose refrain was:

I had a debt I could not pay He paid a debt he did not owe I needed someone To wash my sins away



From the *Financial Times*, 6th February 2019:

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Opinion Catholic Church Pope Francis fights a losing battle in the Middle East The mass flight of Christians from the region continues unchecked

DAVID GARDNER



Pope Francis in Abu Dhabi. The visit was another step in the perennial but glacial institutional rapprochement between Christianity and Islam @ AFP

David Gardner YESTERDAY



From Foreign Affairs, September 2020:

Current Issue



Q SEARCH



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Giving Up on God

The Global Decline of Religion

By Ronald F. Inglehart September/October 2020



Empty seats at a Catholic church in New York City, June 2014





From Gallup, 29 March 2021:

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POLITICS MARCH 29, 2021

U.S. Church Membership Falls Below Majority for First Time

BY JEFFREY M. JONES





Pew Research Center, 14th December 2021:



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REPORT | DEC 14, 2021

About Three-in-Ten U.S. Adults Are Now Religiously Unaffiliated

Self-identified Christians make up 63% of the U.S. population in 2021, down from 75% a decade ago.



The Big Picture.



- To read the press, you would think that in today's world:
 - Christianity is in retreat, caught between secular atheism on one side and militant Islam on the other;
 - Violent struggle is replacing peaceful proselytism as the main engine of religious competition.
- The truth is interestingly different:
 - Both Christianity AND Islam are on the advance today;
 - Peaceful proselytism and demographic growth have largely replaced violent struggle as the engines of religious rivalry.
 - Religion is increasingly becoming corporatized and branded, pushing out local and folk religions across the world.
- Religious rivalry can be understood as a form of *platform competition*. Platforms create relationships, appropriating some of the benefits they make possible.
- In religious platforms, economic exchange interacts with identity, ritual and ideology.

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- Religion since 1900 Census data. Surveys.
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Outline

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4 Summing up.

References.



Topics to be covered later in the course - if there's time.....

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- What makes religions different from other platforms?
 - Ritual;
 - Belief;
 - Narrative;
 - Ethics.
- Religion and beliefs: a Bayesian analysis.
- Religion and political institutions.
- Reformulating the secularization hypothesis for the 21st century.
- Regulating religious organizations.



Changes in the shares of world religions 1900-2020:



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- Some big changes in the shares of world religions since 1900 (and, with more reliable data, since 1950).
- Data are from World Religion Database, presented in Seabright (2024), Statistical Appendix.
- But it's not what you think....
- To get a clue as to why, look at the distribution across regions.



The changing proportions of world religions (source: World Religion Database)



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Shares of World Population by Major Religious Group





The changing proportions of religions in Asia

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The changing proportions of religions in Africa



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Shares of African Population by Major Religious Group





The changing proportions of religions in Europe



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Shares of European Population by Major Religious Group





The changing proportions of religions in North America



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Shares of North American Population by Religious Group





The changing proportions of religions in Latin America



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The importance of demography



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- The different rates of population growth in different countries during the 20th century would have had major effects on the shares of world religions even without any other factors.
- Compare actual shares in 2020 with the shares that would have been predicted on the basis of different country rates of population growth.
- The predicted shares are those that describe what would have happened in the absence of any within-country competition between religions.
- The difference between predicted and actual shares is a measure of the impact of within-country competition.



Global shares of religious adherents, actual versus projected from 1900 or 1970

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Projected Religious Proportions and Outcome in 2020



... there is also movement within religions:



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Religions denominations in Ghana. Share of the population belonging to each religious denomination (other includes atheists) in 2000 and 2021. Based on the Ghana Census. Auriol et al. (2020b): c. 20% changed church within past 5 years.



... there is also movement within religions (Alfonsi et al. (2022) for Kenya):



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- KLPS: 39% from traditional Christian to Pentecostal churches
- Within traditional (7%) and Pentecostal churches (25%).
- Self-reported importance of religion and church attendance is stable.

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What's the story here?

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- The story is not about an ideological struggle between Christianity and Islam, with Islam winning.
- Islam has expanded faster than Christianity because more concentrated in poor parts of Asia with high population growth.
- The story is about the growing corporatization of religion.
- Folk religions everywhere in Asia and especially in Africa have been replaced by their branded and corporately-organized counterparts, some of which are also franchised.
- Catholicism has declined in favor of other Christian denominations. denominations
- But overall, Christianity has benefited more from this trend than Islam, and may do so even more in the future (watch China!).
- Corporatization is also associated with high levels of reported religious commitment compare Africa and Europe.

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The big picture Census data.

between religions.

How important is religion in your life? Africa and Europe compared



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World Values Survey Wave 6: 2010 - 2014

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What about intensity of religiosity?



It's hard to get comparable survey figures across countries and religions and over more than 2-3 decades, but:

- Proportions saying religion is "very" or "somewhat" important in their lives has declined in some countries in recent decades (Ireland, Spain, Chile, the US - though from a high level).
- In many countries it has been low for as long as surveys are available (Japan, Korea, France, Germany, UK) and is not visibly declining further.
- In former communist countries it has increased.
- In Muslim countries it remains very high (over 90%).
- In much of Latin America and Asia it is very high and even increasing (over 80% for Brazil, Colombia, Thailand; over 90% for Indonesia, Myanmar, Philippines).
- In Africa proportion saying religion is "very important" is over 90% in Ethiopia, Ghana, Kenya, Nigeria, Zimbabwe....

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Evolution of religiosity over 4 decades (I)



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North-Western Europe:

% of population for whom religion is very or somewhat important



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Evolution of religiosity over 4 decades (II)



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Evolution of religiosity over 4 decades (III)









% of population for whom religion is very or somewhat important





Evolution of religiosity over 4 decades (IV)



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Evolution of religiosity over 4 decades (V)



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Various countries:



Importance of religion before and after year 2000



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Importance of religion before and after year 2000 (Country groups)





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A possible pattern in these data?

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- There may be several states:Stable high religiosity
 - Stable medium religiosity
 - Stable low religiosity.
- Many of the countries don't see much movement (mean change is -0.4%, statistically indistinguishable from zero).
- But some countries may be in transition between different stable states.
- We may gain insight from looking at different dimensions of religiosity.
- Mean change in belief in God is +1.1%, t=0.61.
- Mean change in monthly service attendance is -3.6%, t=-2.50.

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Belief in God before and after year 2000 (Country groups)



% replying believe in God 9 × TUR × MDA BC × MNE × MKC X IBI × SRB × CHL 8 × TWP × SGPUSA × ITA XXABSB × LVA × NIB × BGR × SVI × AUT . ALESP × HUN 60 After 2000 X RELUX X FIN × AUS × DNK × CAN × FRA X GBB × NOR × NZL 6 × NLD CZE 20 0 20 40 Ó 60 80 100 Before 2000 Y Catholic ¥ Protestant X Mixed Christian X Muslim ¥ Orthodox * 45 deg hlindu Chinese

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Monthly service attendance before and after year 2000 (Country groups)





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Religious movements receive large sums

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Andreoni and Payne (2013): Total private giving by charity classification, \$bn real 2011, Giving USA 2012: Annual Report on Philanthropy.

- Ghana (Auriol et al., 2020b): 10%-15% of income.
- Kenya (Alfonsi et al., 2022): c. 4% of household budgets.



Revenues of religious organizations in the US in 2016:

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- Grim and Grim (2016) estimated revenues of faith-based organizations at 378 billion dollars.
- Greater than the revenues of Apple and Microsoft combined in that year.
- More than 2% of total personal income in the US.
- Equal to 60% of the revenues of media and entertainment industries (film, books, gaming, music).
- Half of the revenues of the US restaurant industry.
- This is without counting contributions of time, energy and resources in kind.
- In many countries it's reasonable to think that 1 in adult in 5 is paying tithes (10% of personal income).

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A problem with the story so far:



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- Why are so many people convinced that religion is in decline?
- A case in point: Ronald Inglehart's Religion's Sudden Decline: What's Causing It, and What Comes Next? (OUP, 2021).
 decline
- Four main reasons:
 - A focus on Europe and North America and neglect of the rest of the world; wvs
 - Inappropriate inference from successive waves of the World Values Survey; China
 - Continuing attachment to the secularization thesis (due to Weber and others) despite logical and evidentiary problems, especially about timing; Pro-natal norms
 - Neglect of the turbulent nature of religious innovation.
- But the story does have some weaknesses: there's a kernel of truth in the secularization hypothesis that needs exploring.
- There *is* declining religiosity in (eg) the US, Ireland, Spain.

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How do religions compete?

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Historically, in three main ways:

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- Through war and conquest.
- Through differential population growth (demographic competition for resources).
- Through persuasion ("in the market").
- The growth in the extent and sophistication of the third mechanism is the outstanding religious fact of the 20th and 21st centuries.
- Adam Smith was fascinated by the process (and especially by the interaction between the first and third mechanism) but the subject fell out of interest among economists until the late 20th century.



Adam Smith and the rôle of competition in shaping religious behavior



- In *The Theory of Moral Sentiments* (1759), Adam Smith harked back to an imagined golden age of peaceful competition between sects and cults, presuming that religion acted to enforce social order:
- "That the terrors of religion should thus enforce the natural sense of duty, was of too much importance to the happiness of mankind, for nature to leave it dependent upon the slowness and uncertainty of philosophical researches." - *TMS*, part III, ch. V.
- An inspiration for Edward Gibbon....?
- "The various modes of worship, which prevailed in the Roman world, were all considered by the people, as equally true; by the philosopher, as equally false; and by the magistrate, as equally useful. And thus toleration produced not only mutual indulgence, but even religious concord." *History of the Decline and Fall of the Roman Empire* (1776).

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In *The Wealth of Nations* (1776), Smith emphasizes underlying human similarity:

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- "The difference of natural talents in different men is, in reality, much less than we are aware of; and the very different genius which appears to distinguish men of different professions..[is not] so much the cause as the effect of the division of labour. The difference between...a philosopher and a common street porter, for example, seems to arise not so much from nature as from habit, custom, and education." WN, bk I, ch. II.
- and differences of religion as adaptations to competition:
- "The interested and active zeal of religious teachers can be dangerous and troublesome only where there is either but one sect tolerated in the society, or where the whole of a large society is divided into two or three great sects; the teachers of each acting by concert, and under a regular discipline and subordination. But that zeal must be altogether innocent where the society is divided into two or three hundred, or perhaps into as many thousand small sects, of which no one could be considerable enough to disturb the public tranquility." V, ch. 1/10/140

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Adam Smith on competition between Anglicans and Methodists



The [clergy] may either depend altogether for their subsistence upon the voluntary contributions of their hearers; or they may derive it from some other fund...such as..an established salary or stipend. Their exertion, their zeal and industry, are likely to be much greater in the former situation than in the latter. In this respect the teachers of new religions have always had a considerable advantage in attacking those ancient and established systems of which the clergy, reposing themselves upon their benefices, had neglected to keep up the fervour of faith and devotion in the great body of the people; and having given themselves up to indolence, were become altogether incapable of making any vigorous exertion in defence even of their own establishment. The clergy of an established and well-endowed religion frequently become men of learning and elegance, who possess all the virtues of gentlemen...but they are apt gradually to lose the qualities, both good and bad, which gave them authority and influence with the inferior ranks of people, and which had perhaps been the original causes of the success and establishment of their religion. - Wealth of Nations, bk V, ch. I. art. III.

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Adam Smith on the life cycle of religious movements



The clergy of an established.. religion.. when attacked by a set of popular and bold... enthusiasts, feel themselves...perfectly defenceless... have commonly no other resource than to call upon the civil magistrate to persecute, destroy or drive out their adversaries, as disturbers of the public peace. It was thus that the Roman catholic clergy called upon the civil magistrates to persecute the protestants, and the church of England to persecute the dissenters; and that in general every religious sect, when it has once enjoyed for a century or two the security of a legal establishment, has found itself incapable of making any vigorous defence against any new sect which chose to attack its doctrine or discipline... If politics had never called in the aid of religion, had the conquering party never adopted the tenets of one sect more than those of another when it had gained the victory, it would probably have dealt equally and impartially with all the different sects, and have allowed every man to choose his own priest and his own religion as he thought proper. There would in this case, no doubt have been a great multitude of religious sects.... – Wealth of Nations, bk V, ch. I. art. III.

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Summarizing the story so far:

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- The big story of religion in the 20th and 21st centuries is not an ideological struggle between a retreating Christianity and an expanding Islam, nor a global decline in religiosity.
- It's about the growing corporatization of religious life and marginalization of folk religions.
- This displacement is not complete, total nor irreversible: individuals may have multiple religious affiliations (in the city and the country?), and their needs will evolve, including through a demand for (non-corporate) "authenticity".
- How do religious organizations compete to meet these needs?
- Religion is big business: see Grim and Grim (2016)'s estimate of revenues of US faith organizations at more than 2% of US personal income.
- Religion is also big politics: Putin, Trump, Modi, Xi Jin-Ping, Netanyahu, Erdogan.....

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The way we pray now:



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The way we pray now (II):



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The way we pray now (III):



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The way we pray now (IV): Master Yinguang returns the favor

周立主府中国林 头线中化领动世界

"Now the range of China's rejuvenation is the globe. We have a good leader, President Xi. Really lucky. I read his speeches when he visited India and several other countries. I feel really happy. He is the reincarnation of the Buddha and he devotes to the country, the national and the lives around the world, regardless himself. Therefore the world is promising"

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Adam Smith's legacy for the economic study of religion:

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- Adam Smith was one of the first writers to see how religious teachings, and the behavior of religious organizations, respond to the conditions under which they compete.
- He made one central methodological and several substantive claims about religious rivalry:
 - The **methodological** claim: we can best understand human beings as fundamentally similar in their beliefs and attitudes, and responsive to incentives in similar ways.

The substantive claims:

- New religious movements have an advantage because their leaders have powerful incentives to win members.
- Established religions have weaker incentives because political leaders have granted them protection in return for the promise of legitimacy.
- Religious competition is more peaceful when there are many competing religions with none of them enjoying political protection.

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The new economics of religion:



- After Adam Smith, economics as a discipline lost interest in religion for a couple of centuries, in spite of the efforts of historians and sociologists like Durkheim, Weber and Tawney to address the economic interactions with religious life.
- Beginning in the 1960s and accelerating in the 1990s, growing convergence between rational-choice sociologists of religion -Berger (1963, 1967); Greeley (1962, 1969, 1989); Finke and Stark (2005)) and economists (lannaccone (1992); Gruber and Hungerman (2007) - that religions compete to satisfy demands.
- Religious adherents are not passive recipients of cultural inheritance but active seekers of religious benefits.
- In this view, religions have their particular characteristics not because they impose these on members, but because they are what members demand.
- The result is not necessarily optimal depends on the interplay of religious entrepreneurs.

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Where do religious demands come from?



- Some contributors take demands as given:
 - Some are intrinsic to religion (such as ritual more later).
 - Some are also supplied by secular institutions (eg education, finance, health, insurance).
- Others suppose religion satisfies a derived demand for institutions to reinforce social trust (Botticini and Eckstein (2012); Greif (1989), though specific cases are controversial see Edwards and Ogilvie (2011).).
- Some emphasize religion as a moral infrastructure that makes individuals more trustworthy (see literature on moralizing Big Gods - Hadnes and Schumacher (2012); Norenzayan (2014)), others its role in reciprocal signaling by trustworthy individuals -Auriol et al. (2020a).
- Tension in this literature between community as a means to other benefits, and community as an end in itself.

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The services provided by religion:



- One line of research sees churches as private clubs that provide exclusive services to members, screened by high financial and behavioral costs of membership (lannaccone (1992)).
- Recent work has described religious institutions as helping to smooth consumption, particularly in the absence of an extensive welfare system (Scheve and Stasavage (2006); Gruber and Hungerman (2007); Dehejia et al. (2007); Chen (2010)).
- In some countries (eg India, see lyer (2018)) religions have greatly expanded the services they provide.
- However:
 - Costs of membership seem high vs. secular alternatives.
 - Profits can be large, but entry barriers seem low.
- A new perspective (thanks to my co-authors Emmanuelle Auriol, Amma Panin and Eva Raiber): Churches charge high prices from members because they are *platforms*, offering bundles of services and screening for trustworthiness of other members.

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The club goods model in detail:



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Services.

Entrepreneurs.

Starting point:

"Sacrifice and Stigma: Reducing Free-riding in Cults, Communes, and Other Collectives",

by Laurence lannaccone,

Journal of Political Economy, 1992



Basic setup:

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- Religious club with N + 1 identical individuals, each of whom maximises utility: U_i = U(S_i, R_i, Q_i)
 - S_i secular commodities
 - *R_i* religious participation
 - Q_i quality of the club
 - $Q_i = F(\bar{R}_i, N)$ • $\bar{R}_i = \sum_{k \neq i} \frac{R_k}{N}$
 - Budget constraint $\pi_s S_i + \pi_r R_i \leq I$
 - Other useful parameters before the propositions
 - k_j expenditure share on commodity j (secular or religious)
 - k_q shadow expenditure share on Q (religious quality)
 - *ϵ_{ij}* elasticities

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PROPOSITION 1 – prohibitions on secular activities increase religious utility



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Let (S_e, R_e, Q_e) define a stable, symmetric Nash equilibrium among the members of a religious club. Then increasing the cost of a nonclub commodity S_j will increase club members' utility if the cross-price elasticity $\epsilon_{r\pi_j}$ is sufficiently large relative to the commodity's expenditure share. Specifically, utility will be increased as long as $\frac{\epsilon_{r\pi_j}}{k_j} > \frac{1-\epsilon_{Fr}\epsilon_{rq}}{k_q\epsilon_{Fr}}$.



PROPOSITION 2 - screening



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Let the population consist of two types of people, 1 and 2, such that the following conditions hold: in a religious group of any given quality Q, (a) type 1 people always participate less than type 2 people ($R_1(Q,...) < R_2(Q,...)$), and (b) type 1 people value group quality less than type 2 people ($\pi_a^1 < \pi_a^1$).

Then, as long as people of type 1 constitute a sufficiently large fraction of the population, there will exist a signaling equilibrium in which type 2 people end up in groups that require their members to sacrifice a valued resource or opportunity and type 1 people end up in groups that require no such sacrifice.



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churches – groups whose norms mirror those of prevailing culture;



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Principles.

Number of users.

Price-quality

Services

Entrepreneu

- churches groups whose norms mirror those of prevailing culture;
- sects groups whose norms place them at odds with prevailing culture;



1. religious groups that demand similar levels of sacrifice display fundamental similarities independent of differences in history, theology, and organization.

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- model.

- - **churches** groups whose norms mirror those of prevailing culture;
 - **sects** – groups whose norms place them at odds with prevailing culture;
 - Group religious organisations according to their behavioural demands:



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1. religious groups that demand similar levels of sacrifice display fundamental similarities independent of differences in history, theology, and organization.

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- strategy.
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- churches groups whose norms mirror those of prevailing culture;
- sects groups whose norms place them at odds with prevailing culture;
- Group religious organisations according to their behavioural demands:
- Find that organisations with stricter demands (*sects*) tend to be smaller, have members who attend more frequently, contribute more per person, and are less productive in secular activities (lower wages, less education, etc.)





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- Somicor

- 1. religious groups that demand similar levels of sacrifice display fundamental similarities independent of differences in history, theology, and organization.
 - 2. Levels of participation and levels of sacrifice demanded by religious groups will be correlated.
 - 3. Sects are more likely to attract members from among people with low wages and limited secular productivity.



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Esteration

4. Conversion, apostasy, and other abrupt shifts in behavior will be more common in sects rather than churches.



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4. Conversion, apostasy, and other abrupt shifts in behavior will be more common in sects rather than churches.

5. The congregations of sects will tend to be smaller than those of churches.



Subsequent extensions of club goods model



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- McBride (2015): in a dynamic setting, organisations may encourage some free-riders. By participating in church today, free-riders build religious capital which makes them more valuable tomorrow.
- Levy and Razin (2012): religious organisations impose beliefs about rewards and punishments for cooperative behaviour. Also predict smaller, stricter groups.



Model explains a lot, but surveys of literature point to two important gaps:

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Iannaccone (1998):

"Before advising the Pope, however, one must note that Lipford (1995) estimates a positive relationship between size and giving across a large sample of Baptist, Presbyterian, and Episcopal congregations in North Carolina. Because all these contribution studies employ different data and different specifications, future research may reconcile their results. Additional work is especially needed to address the endogeneity of size, specifically the selection bias that occurs if large, poorly financed congregations shrink and die more readily than large, well-financed congregations."

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- Iannaccone (1998):
- Iyer (2016):

"One important dimension is the role of social networks. For example, a well-established literature in related disciplines such as sociology has found social networks to be important for religion, religious conversion, and recruitment, and yet this work often lacks formal theoretical models in the spirit of economics, or handles selection effects imperfectly in empirical research. It is here, among other areas, that economists of religion have yet to contribute significantly. The main area that many existing studies do not examine is the role of network structure..."

S



What do we add?



We add new ingredients to the model that allow for...

Religious organisations differing in quality of services offered

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Entrepreneurs.

• Multiple motives of church goers: spiritual and networking



"The preacher's wife needs a new hobby."



The Platform Competition approach

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- When religions offer services they are never just selling these services in head-to-head competition with secular suppliers.
- Literature on multi-sided markets has emphasized role of platforms as putting different groups in contact with each other.
- It's possible to see religious organizations as putting believers in touch with each other, using demand for certain services of religion as credible signals of their trustworthiness.
- Importantly, these services are neither just spiritual, nor just secular. They're both. The two are intrinsically bundled.
- Those who genuinely demand spiritual services are considered more trustworthy counterparties in secular markets.
- It's hard to distinguish "demand side" and "supply side" characteristics: religious adherents both demand and supply components of the overall portfolio.
- But it is possible to distinguish the role of entrepreneurs from that of adherents.

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Religious entrepreneur Jerry Falwell:



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Number of users. Price-quality strategy. Services. Entrepreneurs "Business is usually on the cutting edge of innovation and change because of its quest for finances. Therefore the church would be wise to look at business for a prediction of future innovation. The greatest innovation in the last twenty years is the development of the giant shopping centers. Here is the synergetic principle of placing at least two or more services at one location to attract the customers. A combination of services of two large customers with small supporting stores has been the secret of the success of shopping centers" (cited in Harding, Susan Friend: *The Book of Jerry Falwell: Fundamentalist Language and Politics*, Princeton University Press, 2000.)



An example: services provided by church in Auriol et al. (2020b) (536/570 responses):

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Finding a marital partner:

- Only 5% of respondents say that finding a partner, for themselves or their children, is one of main reasons for attending their church.....BUT
- 28% of married say they found their spouse through church.
- 48% of church population are single, o/w 60% expect to meet their future spouse through church.
 - 57% of single males expecting to meet a spouse in church pay tithes vs only 26% of those not expecting this.
 - No significant difference for single women (38% versus 37%).
 - 53% of single males expecting to meet a spouse in church cite moral guidance as a main motive vs only 41% of those not expecting this (55% versus 41% for single females).

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Services provided by church (II):



Providing counselling for family issues:

- 62% would ask a pastor for help regarding family issues, 25% would ask another church member (multiple answers possible).
- Only 20% say they would ask a pastor for financial help, and 8% would ask another church member....BUT
- 24% report receiving financial assistance from the church within the last 2 years.
- 28% would seek medical support from pastor when sick.
- Reported church donations significantly increase with income, education, church attendance and age.

It seems likely that the motives are linked: members prefer to search for a marital partner among those who signal their willingness to seek church guidance on family and spiritual issues.

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Respondents preferring to interact with church members as friends, at work, in business:

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A Platform Model: Theory



- Religious organizations are platforms: value of services offered to members depends on characteristics of other members.
- These include not just numbers but also quality.
- High prices can increase quality of members a screening mechanism.
- In traditional platform literature, platforms charge low prices to some users to "get them on board".
- We can show that effect of high prices on user quality can outweigh adverse impact on quantity if services are not subject to large congestion effects.
- More precisely, religious adherents pay high prices (financially or in kind) for two reasons:
 - the high price screens high-quality adherents.
 - the high price reflects, for any given adherent quality, an enhanced willingness to pay to interact with other users.

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Setup: Religious organisations as competing platforms



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- Religious platform offer two services: a spiritual service (service A) and a networking service (service B)
 - Spiritual service: sermons, opportunity for prayer/meditation/offerings, confession, counselling
 - Networking service: communal service, festivals, group activities
 - Services are often taking place at the same time, e.g. Sunday service



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 - Spiritual service: sermons, opportunity for prayer/meditation/offerings, confession, counselling
 - Networking service: communal service, festivals, group activities
 - Services are often taking place at the same time, e.g. Sunday service
- Individuals differ on two dimensions: value for the spiritual service and for the networking service



Value for

spiritual service



The big picture

between religions.

Platform model.

Principles.



- θ and ϕ distributed independently on \mathbb{R}^+ , according to density $f(\theta)$ and cumulative distribution function $F(\theta)$ for θ and to density $g(\phi)$ and cumulative distribution function $G(\phi)$ for ϕ .
- Hazard rate function of ϕ , $h(\phi) = \frac{g(\phi)}{1-G(\phi)}$ is weakly monotone increasing.



service



The big picture

between religions.

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- Hazard rate function of ϕ , $h(\phi) = \frac{g(\phi)}{1-G(\phi)}$ is weakly monotone increasing.
- Distributions can depend on external circumstances.





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 Demand for spiritual good is correlated with being a good network member (reliable, moral compass, trustworthy)



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- Demand for spiritual good is correlated with being a good network member (reliable, moral compass, trustworthy)
- Consumption of spiritual good needs to be somewhat observable



Setup: Utility function

User *i* utility function:

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Number of users. Price-quality strategy. Services. $u_i = \theta_i \cdot \alpha \cdot q_A + \phi_i \cdot \beta \cdot q_B - p_A - p_B$

- q_A: quality of spiritual service A
- q_B: quality of networking service B
- Organisations pay a convex per-member cost C(q_A) to provide service A
- Quality of service B is a function of the average "quality" of service A users

(1)



Setup: Pricing and competition

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Number of users. Price-quality strategy. Services. • Assumption: Religious organisations can charge differential prices from their members for usage of service A and B



Setup: Pricing and competition

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- Assumption: Religious organisations can charge differential prices from their members for usage of service A and B
- Religious organisations chose q_A, p_A, p_B



Setup: Pricing and competition

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Principles.

- Assumption: Religious organisations can charge differential prices from their members for usage of service A and B
- Religious organisations chose q_A , p_A , p_B
- Monopolistic competition



Number of users

SE

- Equilibrium numbers of purchasers: n* use service A and m* use service B
- determined by the marginal user:
 - service *B*: $\tilde{\phi}$ where $\tilde{\phi}\beta q_B p_B = 0$
 - service A: $\tilde{\theta}$ where $\tilde{\theta} \alpha q_A p_A = 0$



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Number of users.

Price-quality strategy.

Services.

- Equilibrium numbers of purchasers: *n*^{*} use service A and *m*^{*} use service B
- determined by the marginal user:
 - service *B*: $\tilde{\phi}$ where $\tilde{\phi}\beta q_B p_B = 0$
 - service A: $\tilde{\theta}$ where $\tilde{\theta} \alpha q_A p_A = 0$
- Thus:

$$n^* = 1 - F\left(\frac{p_A}{q_A}\right) \tag{2}$$

$$m^* = 1 - G\left(\frac{p_B}{q_B}\right) \tag{3}$$





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- What determines q_B?
- Network service users care about:
 - The quality of network partners.
 - The probability of finding a match.





What type of networking service?

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Price-quality

Services





- What type of networking service?
- Uncongested systems:
 - Value of having high-quality partners in the community for a given member is relatively independent of the number of other members who are also seeking contact with those partners
 - Example: Business partner, insurance networks

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- What type of networking service?
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 - Value of having high-quality partners in the community for a given member is relatively independent of the number of other members who are also seeking contact with those partners
 - Example: Business partner, insurance networks
- Congested systems:
 - A group of high quality partners is less valuable if there are many people in the community trying to take advantage of those connections
 - Example: Marriage partner
 - Possibility of rationing

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- What type of networking service?
- Uncongested systems:
 - Value of having high-quality partners in the community for a given member is relatively independent of the number of other members who are also seeking contact with those partners
 - Example: Business partner, insurance networks
- Congested systems:
 - A group of high quality partners is less valuable if there are many people in the community trying to take advantage of those connections
 - Example: Marriage partner
 - Possibility of rationing
- Most cases are somewhat in-between.

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No rationing:

• Overall quality of service B is:

$$q_{B}^{u} = \bar{\theta} = \int_{\frac{p_{A}}{q_{A}}}^{+\infty} \frac{\theta f(\theta)}{n^{*}} d\theta = \int_{\frac{p_{A}}{q_{A}}}^{+\infty} \frac{\theta f(\theta)}{1 - F\left(\frac{p_{A}}{q_{A}}\right)} d\theta \quad (4)$$

• $\bar{\theta}$: average θ of spiritual service users i of the platform





No rationing:

• Overall quality of service B is:

$$q_B^{\mu} = \bar{\theta} = \int_{\frac{p_A}{q_A}}^{+\infty} \frac{\theta f(\theta)}{n^*} d\theta = \int_{\frac{p_A}{q_A}}^{+\infty} \frac{\theta f(\theta)}{1 - F\left(\frac{p_A}{q_A}\right)} d\theta \quad (4)$$

- $\bar{\theta}$: average θ of spiritual service users *i* of the platform
- An increase in the price of service A increases the quality of service B: $\frac{dq_B^u}{dp_a} > 0$
- An increase in the quality of service A decreases the quality of service B: $\frac{dq_B^u}{dq_A} = -\frac{p_A}{q_A}\frac{dq_B^u}{dp_A} < 0$

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• $\bar{\theta}$: average θ of spiritual service users *i* of the platform • $\frac{dq_B^u}{dp_A} > 0$ and $\frac{dq_B^u}{dq_A} = -\frac{p_A}{q_A} \frac{dq_B^u}{dp_A} < 0$





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Services.

- Rationing:
 - If one-to-one matching, the probability that user *j* can match with a user *i* is given by min $\left\{\nu \frac{n^*}{m^*}, 1\right\}$
 - Rationing if m* > vn*: overall quality of service B is given by:

$$q_B^r = \nu \frac{n^*}{m^*} \bar{\theta} = \int_{\frac{P_A}{q_A}}^{+\infty} \frac{\theta f(\theta)}{m^*} d\theta$$
 (5)





- Rationing:
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- An increase in the price of service A decreases the quality of service B: $\frac{dq_B^u}{dp_A} < 0$
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$$q_B^r = \nu \frac{n^*}{m^*} \bar{\theta} = \int_{\frac{P_A}{q_A}}^{+\infty} \frac{\theta f(\theta)}{m^*} d\theta$$
 (5)

•
$$\frac{dq_B^u}{dp_A} < 0$$
 and $\frac{dq_B^u}{dq_A} = -\frac{p_A}{q_A}\frac{dq_B^u}{dp_A} > 0$





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 $\max_{p_A, p_B, q_A} \qquad \Pi = n^* [p_A - C(q_A)] + p_B m^* \qquad (6)$ s.c. $n^* = 1 - F\left(\frac{p_A}{q_A}\right)$ $m^* = 1 - G\left(\frac{p_B}{q_B}\right)$



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Let $\varepsilon_{n^*,p_A} = -\frac{\partial n^*}{\partial p_A} \frac{p_A}{n^*}$ be the price elasticity of the demand for service A of quality q_A . To maximize its profit, the church platform chooses the price and quality vector solution of the following equations:

$$\frac{A - C(q_A)}{p_A} = \frac{1}{\varepsilon_{n^*, p_A}} - \frac{p_B}{p_A} \frac{\partial m^*}{\partial n^*}$$
(FOC1)
$$C'(q_A)q_A = p_A$$
(FOC2)
$$\frac{p_B}{q_B} = \frac{1 - G\left(\frac{p_B}{q_B}\right)}{g\left(\frac{p_B}{q_B}\right)}$$
(FOC3)



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$$\frac{p_A - C(q_A)}{p_A} = \frac{1}{\varepsilon_{n^*, p_A}} - \frac{p_B}{p_A} \frac{\partial m^*}{\partial n^*}$$
(FOC1)

- Monopoly price equation plus distortion proportional to $\frac{\partial m^*}{\partial n^*}$
- Spiritual users generate externality for network users
- When matching is congested $\frac{\partial m^*}{\partial n^*} > 0$, so the second term in equation FOC1) is negative.
- All else equal, platform chooses lower prices *p*_A when network access to spiritual members is congested.
- The opposite holds when matching is uncongested.

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Let $\varepsilon_{n^*,p_A} = -\frac{\partial n^*}{\partial p_A} \frac{p_A}{n^*}$ be the price elasticity of the demand for service A of quality q_A . To maximize its profit, the church platform chooses the price and quality vector solution of the following equations:

$$C'(q_A)q_A = p_A$$
 (FOC2)

- No distortion on quality *q_A* for a given price.
- Price *p_A* is adjusted for externality for a fixed price.
- q_A^* is unique and strictly increasing with p_A .



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Let $\varepsilon_{n^*,p_A} = -\frac{\partial n^*}{\partial p_A} \frac{p_A}{n^*}$ be the price elasticity of the demand for service A of quality q_A . To maximize its profit, the church platform chooses the price and quality vector solution of the following equations:

$$\frac{p_B}{q_B} = \frac{1 - G\left(\frac{p_B}{q_B}\right)}{g\left(\frac{p_B}{q_B}\right)}$$
(FOC3)

- Platform adjusts price *p_B* to keep proportion of B users constant.
- $p_B = \nu q_B \Phi$ so that $m^* = 1 G(\Phi) \quad \forall q_B > 0.$
- For instance, with a uniform distribution on [0, M] $h(x) = \frac{1}{M-x}$ so that $\Phi = \frac{M}{2}$, $p_B = \frac{\nu M}{2}q_B$ and $m^* = \frac{1}{2}$.

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A simple parametric example:

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We assume that:

- $C(q) = c \frac{q^2}{2}$.
- θ and ϕ are distributed independently and uniformly on [0, 1] and [0, *M*] respectively.
- The parameter *M* can be interpreted as a measure of the intensity of group *j*'s preference for being put in contact with high quality members of group *i*.



Effect of p_A on profits, no platform effects: low price



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Effect of p_A on profits, no platform effects: mid price

 p_A



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Effect of p_A on profits, no platform effects: high price



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Choosing p_A to maximize profits, no platform effects





Profits from service A and service B users as a function of p_A : congested and uncongested case

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Choosing p_A with and without platform effects congested and uncongested cases compared







Comparative statics (I)



- Increase in α (for instance because of an earthquake shock): q^r_A and q^u_A increase and the price of service A increase, while q^r_B and p^r_B decrease and q^u_B and p^u_B increase.
- Increase in β (for instance because of rural exodus and urbanisation): q_A^r (and p_A^r) decrease and q_A^u (and p_A^u) increase while q_B^r (and p_B^r) and q_B^u (and p_B^u) increase.
- Hazard rate dominance: Shift in the hazard rate so that $h_1(\phi)$ hazard rate dominates $h_2(\phi)$ implies from (FOC3) that $\Phi_1 \ge \Phi_2$. That is $h_1(\phi) = \frac{g_1(\phi)}{1-G_1(\phi)} \le h_2(\phi) = \frac{g_2(\phi)}{1-G_2(\phi)}$ which implies that $G_1(\phi) \le G_2(\phi)$ so that everything else being equal the price of service *B* increases. In other words, hazard rate dominance, which implies stochastic dominance, lead to higher price of service *B*. When the distribution of ϕ shifts to the right (i.e. higher values) the price of service *B* increases.

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Comparative statics (II)

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- We can also explore the effect of various parameters on the probability that service B becomes congested. We sign the derivative of the probability of a successful match, $\min\left\{\nu\frac{n^*}{m^*},1\right\}$ for values of the expression $\nu\frac{n^*}{m^*}$ greater than 1, since at less than one the service becomes congested. If the derivative is positive the probability that the service is congested decreases. It is straightforward to show that:
- An increase in α (which raises n* while lowering q_A and therefore m*) leads to a decrease in the probability of congestion.
- An increase in β (which raises m^{*}) leads to an increase in the probability of congestion.
- An increase in κ (which lowers n* while raising m*) leads to an increase in the probability of congestion.



Extending the objective function (I)



 Platforms might maximize V, a weighted average of profits and total membership:

$$V = \gamma . \Pi + (1 - \gamma) . n^* = n^* [1 - \gamma + \gamma . p_A - \gamma . C(q_A)] + p_B \gamma m^*$$

• This yields First Order Conditions:

$$\frac{\partial \Pi}{\partial p_{A}} = \gamma . n^{*} + \frac{\partial n^{*}}{\partial p_{A}} [1 - \gamma + \gamma . p_{A} - \gamma . C(q_{A})] + p_{B} \frac{\partial m^{*}}{\partial p_{A}}$$

Rearranging yields:

$$\frac{p_{A} - C(q_{A})}{p_{A}} = \frac{1}{\varepsilon_{n^{*}, p_{A}}} - \frac{1 - \gamma}{\gamma} - \frac{1}{\gamma} \frac{p_{B}}{p_{A}} \frac{\partial m^{*}}{\partial n^{*}}$$
(FOC1V)

• Comparing this with equation FOC1 shows that the price-cost margin will be lower than in the baseline case to the extent that $\gamma < 1$. As $\gamma \rightarrow 1$, FOC1V \rightarrow FOC1.

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Extending the objective function (II)



 Alternatively, platforms may care about member quality as well as numbers:

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- $V = \gamma . \Pi + (1 \gamma) . (\tau . n^* + (1 \tau) q_A)$
- In contrast to the effect of caring about member numbers, caring about member quality results in higher prices.
- In the uniform case where $q_A = (1 \frac{n^*}{2})$, we can solve for the threshold τ where the two effects of member quality and quantity just offset each other.
- The First Order Conditions are:

$$\frac{\partial (\tau . n^* + (1 - \tau)(1 - \frac{n^*}{2})}{\partial n^*} = 3\tau - 1 = 0$$

which yields a threshold of $\tau = \frac{1}{3}$. For $\tau < \frac{1}{3}$ prices are *higher*, for $\tau > \frac{1}{3}$ prices are *lower* than the profit-maximizing level.



Discussion



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- Variety of strategies on pricing and service provision:
 - High price + high quality for service A vs. low price + low quality for service A
 - Platforms with services prone to congestion: bundle of low price and low quality for spiritual service
 - Platforms with services not prone to congestion: bundle of high price and high quality for spiritual service



Discussion



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- Variety of strategies on pricing and service provision:
 - High price + high quality for service A vs. low price + low quality for service A
 - Platforms with services prone to congestion: bundle of low price and low quality for spiritual service
 - Platforms with services not prone to congestion: bundle of high price and high quality for spiritual service
- Both services are higher priced than if there was no bundle:
 - *p_A* because it also screens high-quality users
 - *p_B* because the networks partners are screened





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1. We can reconcile the fact that different denominations have different size-giving gradients.





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- 1. We can reconcile the fact that different denominations have different size-giving gradients.
 - On average sect are smaller and get more contributions. Robust result amongst American Christian churches at different points in time.





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- 1. We can reconcile the fact that different denominations have different size-giving gradients.
 - On average sect are smaller and get more contributions. Robust result amongst American Christian churches at different points in time.
 - However, average seems to mask significant and systematic heterogeneity.





- 1. We can reconcile the fact that different denominations have different size-giving gradients.
- 2. We may be explain the existence of sects (small, high contribution organisations) whose members have relatively high secular productivity.

Our model: "We predict that, everything else being equal, platforms which aim to foster rival interactions, such as matrimonial services, will choose for their spiritual services a lower price and lower quality bundle than churches aiming to foster non-rival ones, such as business partnerships. In the latter case, spiritual services will be more expensive and more luxurious, and therefore more exclusive."

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- 1. We can reconcile the fact that different denominations have different size-giving gradients.
- 2. We may be explain the existence of sects (small, high contribution organisations) whose members have relatively high secular productivity.
- 3. We explain heterogeneity in demand for membership:





1. We can reconcile the fact that different denominations have different size-giving gradients.

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- 2. We may be explain the existence of sects (small, high contribution organisations) whose members have relatively high secular productivity.
- 3. We explain heterogeneity in demand for membership:
 - From lannaccone: members maximise utility $U_i = U(S_i, R_i, Q_i)$ where $Q_i = F(\bar{R}_i, N)$ and $\bar{R}_i = \sum_{k \neq i} \frac{R_k}{N}$





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 - Value of group membership only depends on religious participation *R_i* of other members





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 - Value of group membership only depends on religious participation *R_i* of other members
 - Could enjoy own *R_i* without being part of the group.





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 - Value of group membership only depends on religious participation *R_i* of other members
 - Could enjoy own *R_i* without being part of the group.
 - We allow for two things:





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 - Value of group membership only depends on religious participation *R_i* of other members
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 - We allow for two things:
 - Higher utility from own religious consumption when part of the group.





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 - Value of group membership only depends on religious participation *R_i* of other members
 - Could enjoy own *R_i* without being part of the group.
 - We allow for two things:
 - Higher utility from own religious consumption when part of the group.
 - Recent causal evidence suggests that non-religious network motivations also matter.





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- 3. We explain heterogeneity in demand for membership:



Applications of the platform model



- The framework is flexible: business models of platforms can be very varied (e.g. depending on scale, or importance of congestion).
- The example of Pentecostalism is illustrative, not definitive: elements of platform competition are visible in Christian, Muslim, Hindu, Buddhist and Jewish traditions.
- In practice, many religious organizations practise complex multi-dimensional pricing, involving not just financial costs but also "lifestyle" costs, and targeted price discrimination.
- The also embody sophisticated management strategies and "organizational capital", aimed at "drawing in" members.
- Platforms can make significant economic rents in spite of competition, but entrepreneurs can take these rents in different forms, including in what Hicks (1937) called "the quiet life".
 - To see this intuition, it's useful to look at a modified Hotelling model of competition. Hotelling

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Understanding the different services on the platform: some open questions

- Theological/Ideological components:
 - Does belief precede or follow religious commitment?
 - How "optional" are theological commitments?
- Ritual components:
 - What is the attraction of ritual complexity? (ritual)
 - What is the attraction of synchronized performance?
- Service components:
 - What cost advantages do religions have in service delivery?
 - Are religious intermediaries more trustworthy than secular providers? (trust)
- Creation of community:
 - How does community interact with identity?
 - Can multiple communities overlap?
 - What's the link between branding and community?

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The role of religious entrepreneurs



- Because platforms make equilibrium rents, entrepreneurs are not forced to maximize profits. They may also be motivated by:
- Theological or political convictions;
 - Altruistic or other reasons for providing community goods.
 - Vanity or desire for publicity.
 - Media platforms provide an interesting analogy:
 - Media proprietors may seek profits or political persuasion.
 - Szeidl and Szucs (2021) document allocation of media advertising contracts by government and favorable coverage of corruption issues by favored media;
 - They use ownership changes to test for causal evidence of exchange of favors, versus correlation of government and owner ideology. They find evidence of both mechanisms.
 - Religions don't have advertisers, but analogy still useful.
 - Raiber and Seabright (2021) use the Covid-19 pandemic shock to look at US churches' online postings and find little evidence of political motivation. Covid

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Summing up: the interdisciplinary perspective

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- The economic approach outlined here emphasizes:
 - Agency, and strategic lucidity, of members and leaders.
 - Culture is not received passively but actively constructed.
 - Broad similarity of underlying motivations of individuals across different cultures, classes, ethnicities.
- What kinds of tensions does this create with other disciplines that may put more stress on:
 - Fidelity of cultural transmission across generations?
 - The ethnographic uniqueness of particular settings or historical periods?
 - The shaping of motivations and meanings by factors difficult to compare between contexts?
- Can different disciplines find a common language to describe religious rivalry while retaining their particular focus?

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A Hotelling model of preferences for quality partners:



- There are two firms, identified as 0 and 1, located at either end of a unit line.
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- They have products with intrinsic qualities θ_0 and θ_1 .
- Prices are p_0 and p_1 , marginal costs normalized to zero.
- Consumer located at point i has to pay a "transport cost" equal to t times i in order to consume the product of firm 0, and a cost equal to t times (1 - i) to consume the product of firm 1.
- If market fully covered marginal consumer has:

$$\theta_0-p_0-t.i=\theta_1-p_1-t(1-i)$$

which yields

$$i* = rac{1}{2} + rac{(heta_0 - heta_1) - (p_0 - p_1)}{2t}$$



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A Hotelling model (II):



- Define $\theta = \theta_0 \theta_1$.
- If firms set prices to maximize profits, Nash equilibrium is:

$$p_0 = t + \frac{\theta}{3}$$

 $p_1 = t - \frac{\theta}{2}$

and

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- This means prices are increasing in transport costs.
- A firm can offer a product of lower quality than that of its rival and still stay in business if θ ≤ 3t. So transport costs protect lower quality firms.



A Hotelling model (III):



• Let quality of the products be a function of the average quality of the members that buy them.

$\theta_0 = \phi_0 + q(1-\frac{i}{2})$

• This increases the impact of transport costs on price setting. The new Nash equilibrium is:

$$p_0 = t + rac{q}{2} + rac{\phi}{3}$$

and

$$p_1 = t + \frac{q}{2} - \frac{\phi}{3}$$

- Even if transport costs tend to zero, price and profit do not.
- Even with zero transport costs, a lower quality firm can stay in business if $\phi \leq \frac{3q}{2}$.

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Empirical Application of a Hotelling model:



- Corbi and Miessi Sanches (2022) estimate an empirical Hotelling model of religious competition in which individuals sort into churches according to political preference.
- They claim that churches are much more conservative than their members (thereby deviating from profit maximization).
- They therefore claim that it's the increasing political liberalism of Americans in the last 25 years (not matched by the churches) that has led to declining importance of religion.
- Understanding the conclusion starts from the utility function of the religious consumer. An individual *i* chooses church *j* at time *t*, yielding utility:

$$u_{ijt} = \gamma (\delta_{jt} - \delta_{it})^2 + \xi_{jt} + \zeta_{ijt}.$$
(7)

where $\gamma < 0$, δ_{it} is the individual's political ideology and δ_{jt} is the church's political ideology. ξ_{jt} is a time-varying church-specific effect and ζ_{ijt} is an idiosyncratic taste shock, distributed i.i.d Extreme Value Type I.

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Empirical Application (II):



- The choice j = 0 represents the outside option of no religious affiliation, with $u_{i0t} = \xi_{0t} + \zeta_{i0t}$.
- The individual *i* chooses church *j* with probability:

$$S_{ijt}(\delta_{jt}, \delta_{-jt}) = \frac{\exp(\gamma(\delta_{jt} - \delta_{it})^2 + \xi_{jt}^0)}{1 + \sum_{r=1}^J \exp(\gamma(\delta_{rt} - \delta_{it})^2 + \xi_{rt}^0)}.$$
 (8)

where δ_{-jt} is vector of church ideological types and $\xi_{jt}^0 = \xi_{jt} - \xi_{0t}$.

• Then aggregate demand for church *j* at period *t* is:

$$S_{jt}(\delta_{jt}, \delta_{-jt}) = \frac{\sum_{i=1}^{N^t} S_{ijt}(\delta_{jt})}{N^t}.$$
(9)

where N^t is the number of individuals in the market.

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Empirical Application (III):



Churches maximize a payoff function given by

$$\Pi_{jt} = \theta_j S_{ijt} (\delta_{jt}, \delta_{-jt}) N^t - \psi_j (\delta_{jt} - \mu_{jt})^2.$$
(10)

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where μ_{jt} is the church's "ideal" ideological type.

• This yields FOC:

$$2\psi_j(\delta_{jt} - \mu_{jt}) = \theta_j \frac{\partial S_{jt}(\delta_{jt}, \delta_{-jt})}{\partial \delta_{jt}} N^t.$$
(11)

Rearranging:

$$\delta_{jt} = -\frac{\theta_j}{2\psi_j} \frac{\partial S_{jt}(\delta_{jt}, \delta_{-jt})}{\partial \delta_{jt}} N^t + \mu_{jt}.$$
 (12)

- So you can apparently recover all the churches' ideological types just from individual choices!
 - Smoke and mirrors...what is going on?



Empirical Application (IV):



- Go back to equation 7: $u_{ijt} = \gamma (\delta_{jt} \delta_{it})^2 + \xi_{jt} + \zeta_{ijt}$.
- This means that choice probability declines as the square of distance from δ_{jt}.
- Now imagine you have an array of members of some church from less to more conservative:



 Where would you expect the church's ideology (δ_{jt}) to be located?

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Empirical Application (V):





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More conservative

More liberal



Empirical Application (VI):



- The answer must be to the right of the cluster of observations!
- This is imposed by the assumptions that choice probability declines as square of distance, and that ξ_{jt}, ζ_{ijt} are i.i.d.
- Similarly, if the whole distribution of observations moves down and to the left (becomes more liberal and declines in attendance), this will mechanically generate a greater distance from the church's ideological position.
- Suppose instead that more conservative individuals are more likely to go to church, independently of the ideological distance of the church from their own beliefs.
- Then ζ_{ijt} will be correlated with ideology δ_{it}. For example ζ_{i0t} < ζ_{k0t} for all *i* more conservative than *k*. This is ruled out by assumption. But it could explain why churches are in fact not so far out of match with their members' political ideology as Corbi and Miessi Sanches (2022) conclude.

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Empirical Application (VII):



• The authors show impressive correlation of estimates of δ_{it} with survey of attitudes of clergy:

> Figure 4: Correlations Between Church Ideology: Model (y) and Cooperative Clergy Study Project Data (x)





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- But note that the estimates are normalized; clergy could all be more liberal or more conservative on average than δ_{it} .
- Assumes church ideology the same as that of priests.


The role of belief: does it precede or follow religious commitment?



- Strong correlation between holding beliefs and membership of religions that promote them. Two main explanations:
 - People join religions that promote beliefs they find convincing;
 - People adopt beliefs promoted by religions they have joined for other reasons.
- This second process may have Bayesian components but is unlikely to be fully Bayesian:
 - Religious adherents may adopt beliefs promoted by religious leaders partly because these leaders have been convincing about other claims;
 - But this confidence does not discount fully the fact they they joined the religion for other reasons.
- How similar is this to other forms of "learning under diverse world views"? See Mailath and Samuelson (2020)

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The role of belief: how can religions "agree to disagree"?



- Aumann (1976) asks how rational Bayesians can agree to disagree about the truth of any proposition.
 - Aumann's Theorem: "If two people have the same priors, and if their posteriors for an event A are common knowledge, then these posteriors are equal".
 - It follows that the only reasons two people can have for disagreeing about a posterior probability are
 - Their posteriors are not common knowledge;
 - Their priors are not equal;
 - They are not Bayesian reasoners.
- How does this help us understand why members of different religions disagree about theological claims?
 - They may not have common knowledge of beliefs;
 - Different religions may sustain different priors;
 - Religious belief may not be a form of Bayesian reasoning (see Levy and Razin (2012, 2017)).

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Aumann's Theorem

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- Let (Ω, ℬ, p) be a probability space.
- P₁ and P₂ are partitions of (Ω) whose join (coarsest common refinement) consists of non-null events.
- *p* is the common prior of 1 and 2.
- Given ω ∈ Ω, an event E is common knowledge at ω if E includes the member of meet 𝒫₁ ∧ 𝒫₂ (finest common coarsening of 𝒫₁ and 𝒫₂) that contains ω.
- Let A be an event, and q_i(ω) = p(A ∩ P_i(ω))/p(P_i(ω)) be the posterior probability of A given i's information.
- Aumann's Theorem states that if it is common knowledge at ω that q₁(ω) = q₁ and q₂(ω) = q₂, then q₁ = q₂.



Proof of Aumann's Theorem



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- Let P be the member of $\mathscr{P}_1 \wedge \mathscr{P}_2$ that contains ω .
- Write $P = \bigcup_{j} P^{j}$ where the P^{j} are disjoint members of P.
- Since $\mathbf{q}_1(\omega) = q_1$ for all P^j in P, $p(A \cap \mathbf{P}^j)/p(\mathbf{P}^j) = q_1$ for all j.
- Thus, summing over j, we have $p(A \cap \mathbf{P}) = q_1 p(\mathbf{P})$.
- Similarly $p(A \cap \mathbf{P}) = q_2 p(\mathbf{P})$
- Thus $q_1 = q_2$.

beliefs



Why are rituals attractive to members?



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- Song, dance, theatre all make many religious rituals compete well with other secular forms of entertainment (but see Trevor Noah: *Born a Crime*).
 - Emphasis on participation makes individuals feel valued.
 - Synchronization is both valuable training and a signal that others are paying attention to you.
 - Socially approved opportunities for experiencing altered or ecstatic states.
 - Whitehouse (2004) emphasizes two modes of religiosity:
 - Imagistic mode helps to bond group members to each other.
 - Doctrinal mode helps to ensure fidelity of transmission.



Why are rituals attractive to members? (II)

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- What are the advantages of ritual complexity?
 - Adaptive accounts:
 - More efficient transmission of social learning (see Tomasello (1990); Tennie et al. (2009) on *over-imitation*; critique by Whitehouse (2021));
 - Signal of belonging to a group whose membership is marked by acceptance of the ritual.
 - Exploitative accounts: religious leaders impose complexity to diminish accountability and extract rents.

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Service delivery: the cost advantages of religions

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- Scale-to-scope advantages:
 - A large congregation can hear marketing messages with little additional cost.
 - Church members can learn at low cost about other members' experience of the services
- Information advantages:
 - Church leaders know a lot about the personal circumstances of members (employment, finances, family, health).
 - This helps them tailor their services to individual members (insurance, lending, education, health).



Auriol et al. (2020b)'s experimental findings on secular services:



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- With Emmanuelle Auriol, Julie Lassebie, Eva Raiber and Amma Serwaah-Panin in Ghana, we offer subjects the chance to participate in a dictator game in which they can choose to keep money or to give it to their church or to general religious charities or general secular charities.
- We have a treatment in which we provided free funeral insurance.
- We show that participants in the treated group gave less money to their church, compared to a control group that had just been told about the insurance.
- They also gave less to secular charities, suggesting that the insurance they had been implicitly relying on works in the eyes of God rather than via a contract with the church.



Service delivery: the trust advantages of religions

- Church leaders may be better trusted:
 - to provide insurance when it is needed;
 - to provide advice on health or other credence goods.
- Client behavior is better:
 - default rates on loans are lower;
 - parents provide more complementary input to childrens' education.
- Examples from the literature:
 - Insurance (?Ager and Ciccone (2016); Bentzen (2018); Auriol et al. (2020b)).
 - Social welfare (Scheve and Stasavage (2006); Gruber and Hungerman (2007)).

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Auriol et al. (2020a)'s experimental findings on screening for character:



- With Emmanuelle Auriol, Maleke Fourati, Diego Delissaint and Josepa Miquel-Florensa, we show in a 774-subject experiment in Haiti that more religious people are more trustworthy than others.
- We measure religiosity by willingness to purchase religious images to accompany play in the game.
- Effect sizes are large: between 14% and 21% of mean behavior.
- They don't reciprocate more after priming than before, nor more to members of the same denomination.
- Our measures of degree of religiosity in the lab correlate with intuitive measures of religiosity outside the lab.
- They also correlate with participation in lending and (especially) borrowing behavior outside the lab suggesting trustworthiness associated with religiosity has economic payoffs.

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Auriol et al. (2021)'s experimental findings on religiosity and risk aversion:



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- Each subject has 10 tokens, can gamble 1 to 10 tokens, with probability 60% the stake is doubled.
- A neutral baseline game, then three games with 7 or 8 tokens plus one image.
- A last game where subjects can choose which to play again. Those who forgo tokens to play with images are called *buyers*.
- Buyers make riskier bets than non-buyers.
- Buyers increase their bets by more than non-buyers when playing in the presence of images.



The Raiber/Seabright Covid study - setup



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- Sample of 10,000 US churches from website usachurches.org.
- c.4,000 have an active Facebook profile from January 2020 to August 2021.
- The Covid shock should create different incentives for entrepreneurs with political motivations from those with financial or altruistic motivations.
- If political motives predominate we should see:
 - an increase in political posts;
 - a decline in member evaluations per post;
 - divergence in movement online and Covid/vaccination postings in areas of Republican versus Democrat support.



The Raiber/Seabright Covid study - findings



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- No difference in extent of movement online in Democrat/Republican areas.
- Only 1% of posts are "political" on average, though proportion rises round elections, start of pandemic, Capitol riot, BLM.
- political posting lags measures of user enthusiasm, indicating that it is probably demand-driven.
- Little divergence between Republican and Democrat strongholds in incidence of Covid posts, donation posts, political posts.
- Vaccine posts show much stronger representation in Democrat strongholds in 2021.



Proportions of posts indicating online activity



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Online activity indicator in Republican versus Democrat strongholds



Republican Vote Share highest 25 percentile Republican Vote Share lowest 25 percentile



Proportions of "political" posts



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Share of "political" posts in Republican versus Democrat strongholds





Political posts and "likes"



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Political posts and "likes" per post, Jan 2020-Aug 2021





Political posts and comments



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Political posts and comments per post, Jan 2020-Aug 2021





Proportions of "donation" posts



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Share of "donation" posts in Republican and Democrat strongholds





Proportions of "Covid" posts



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Share of Covid posts in Republican and Democrat strongholds





Proportions of "vaccine" posts





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Share of vaccine posts in Republican and Democrat strongholds





The changing proportions of Christian denominations



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Christian denominations by region, 2020



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Shares of Christian Denomination by Region 2020





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"Today, Christianity is living through a reformation that will prove to be even more basic and more sweeping than the one that shook Europe during the sixteenth century. That earlier reformation...was confined to one small corner of the globe...The current reformation, however, is an earth-circling one. [It] is shaking foundations more dramatically than its sixteenth-century predecessor, and its results will be more far-reaching and radical."

Harvey Cox, Preface to Global Pentecostal and Charismatic Healing, 2011



The Inglehart (2021) thesis



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- Mechanism: "In the 21st century, secularization has accelerated in much of the world, largely because of rising existential security and a shift from pro-fertility norms to individual-choice norms".
- Timing: "Young people in high-income societies are increasingly aware of the tension between religion and individual-choice norms, motivating them to reject religion. Beginning in 2010, secularization has accelerated sharply".
- Scope: "Data is available from each of these three types of countries: in Muslim-majority countries, religion remains strong; in most former communist countries, religiosity has grown, and in virtually all high-income countries we find declining religiosity" back



World Values Survey as reported by Inglehart: changes in importance of God 2007-2019



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WVS data from China

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How Important is	God in Vo	ur l ifo	Resnanses	from	China
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	TOTAL	1989-1993	2005-2009	2010-2014	2017-2020
Not at all important	44	77	35	27	52
2	12	9	10	16	11
3	8	3	8	10	9
4	4	2	3	4	4
5	7	2	8	6	9
6	5	1	6	5	4
7	4	1	4	6	3
8	4	1	5	5	3
9	2	0	3	2	1
Very important	3	1	4	2	3
Don't know	7	2	13	12	0
No answer	1	0	1	4	0
Base mean	7657	977	1730	1926	3024
Mean	3	1,6	3,5	3,5	2,8





Religiosity and pro-natalist norms: China and Iran compared



Children per woman

Our World in Data

Measured as the total fertility rate, which is the number of children that would be born to the average woman if she were to live to the end of her child-bearing years and give birth to children at the current age-specific fertility rates.



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Declining religiosity in the US (I):



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Church Membership Among U.S. Adults Now Below 50% Do you happen to be a member of a church, synagogue or mosque? - % Yes, member - % Yes, member - 73 73 73 71 71 88 69 70 64 61 57 - 75 50 47 - 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1985 2000 2005 2010 2015 2020 Based on annual aggregated data, usually based on two surveys GALLUP



Declining religiosity in the US (II):



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Change in Percentage of U.S. Adults With No Religious Affiliation, by Generation





Birth years by generation: traditionalists (1945 and before); baby boomers (1946-1964); Generation X (1965-1980), millennials (1981-1996), Note: 33% of Generation Z adults (born 1997-2002) between 2018 and 2020 had no religious preference.

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Declining religiosity in the US (III):



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Changes in Church Membership Among Americans Who Have a Religious Affiliation

- % Member of a church, synagogue or mosque

73					
	70		60		
1998-2000	2008-2	2010	2018-2020		
Data are based on U.S. adults who expressed a religious preference or affiliation, including any Christian or non-Christian religion. The percentage of U.S. adults with a religious affiliation was 90% in 1998-2000, 84% in 2008-2010 and 76% in 2018-2020.					
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Change in Church Membership Among Those With a Religious Affiliation, by Generation

- Traditionalists - Baby boomers - - Generation X ---- Millennials





Declining religiosity in the US (V):

SE

Changes in Church Membership, by Demographic Subgroup

	1998-2000	2008-2010	2018-2020	Change, 1998-2000 to 2018-2020
	%	96	%	pct. pts.
Men	64	58	46	-18
Women	73	65	53	-20
Non-Hispanic White adults	68	62	52	-16
Non-Hispanic Black adults	78	70	59	-19
College graduate	68	65	54	-14
Not college graduate	69	60	47	-22
Married	71	68	58	-13
Not married	64	55	42	-22
Republican	77	75	65	-12
Independent	59	51	41	-18
Democrat	71	60	46	-25
Conservative	78	73	64	-14
Moderate	66	59	45	-21
Liberal	56	46	35	-21
East	69	58	44	-25
Midwest	72	66	54	-18
South	74	70	58	-16
West	57	51	38	-19
Protestant Catholic GALLUP	73 76	72 73	64 58	-9 -18

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