




How Cooperation Drove the Origin and Evolution of Religion:

A Literature Review in the Economics of Religion

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Abstract: The use of economic methods to study and explain the origin and evolution of religion has become an important component of the economics of religion. Compared with disciplines such as religious anthropology, psychology, sociology, and phenomenology, economics often focuses more on the role and effectiveness of the earliest religions in promoting in-group cooperation. That is, religion's capacity to enhance cooperation within a group is regarded as the principal driving force behind its origin. In explaining the evolution of religion, economics emphasizes the dynamic strategic interaction between religion and other social factors.

Keywords: Economics of religious, cooperation, origin of religion, evolution of religion

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Introduction

The economics of religion is an emerging discipline that uses economic methods to study religion (Stark 2006; McBride 2023). Generally speaking, contemporary economics can be divided into two research approaches: neoclassical economics and modern economics. Therefore, the economics of religion can also be divided into two types: those based on neoclassical economics and those based on modern economics.

Neoclassical economics constructs a “supply-demand” analytical framework; therefore, when applied to religion, it tends to interpret religion as a special kind of commodity(s), with religious organizations as suppliers and believers as demanders. Concepts widely discussed in the sociology of religion in China, such as “rational choice theory of religion”, “religious market theory”, and “religious economy” — all derive methodologically from neoclassical economics (Finke & Stark 2003; Lechner 2007). Modern economics, represented by transaction cost theory, new institutional economics, game theory, and evolutionary game theory, has not yet formed a unified theoretical framework and is usually oriented toward concrete problem domains. Furthermore, because religion intersects numerous aspects of society, the research topics and results on religion using modern economics are dispersed across many fields including economics, sociology, political science, ethics, philosophy, linguistics, and biology. Therefore, a comprehensive and systematic review of the economics of religion based on modern economics becomes extremely difficult.

This paper focuses specifically on research in the economics of religion that addresses the origin and evolution of religion. Because the neoclassical economics approach concentrates on supply-demand analysis, related research rarely touches upon the topic of the origin and evolution of religion except in limited involvement of the organizational evolution of religious organizations when discussing church-sect dynamics. Research on religious origins and evolution therefore mainly adopts the approach of modern economics.

One of the greatest achievements of game theory is effectively demonstrating that non-cooperative games can nonetheless yield cooperative outcomes (Zhang 2023, p. 129). Consequently, cooperation has become a crucial topic in modern economics. Given that cooperation is indeed a perpetual theme in human society, this paper examines and analyses research on the origins and evolution of religion within the economics of religion from the perspective of social cooperation (i.e., a game theory perspective).

It should be noted that the relationship between religion and cooperation is bidirectional. Therefore, the economics of religion, based on modern

economics, can explain human cooperation from a religious perspective—that is, explain the mechanism by which religion affects cooperation—and can also explain human religion from a cooperative (or game-theoretic) perspective—that is, explain the origin and evolution mechanism of religion within the context of the complexity and evolution of cooperative forms. In a previous paper, we outlined outlining three mechanisms by which religion affects human cooperation: signaling mechanism, punishment mechanism, and norms internalization mechanism (Peng, forthcoming). This article will review relevant research on the impact of human cooperation on the origin and development of religion.

It should also be noted that, from an evolutionary standpoint, the origin and evolution of religion are almost synonymous. Generally speaking, in these Evolutionary Religious Studies (ERS), religion is viewed as a product of natural selection (or a by-product of certain evolutionary cognitive characteristics), possessing inherent adaptability and capable of enhancing individuals or groups fitness (Wilson & Green 2012). Furthermore, since the forms of human cooperation and their evolution involve numerous factors (such as social scale, war, politics, economics, and cultural institutions), these forms of social cooperation and their influencing factors also shape the evolution of religion.

This paper proceeds as follows: first, we provide a cooperation-based overview of the origins of religion; then, we examine the evolution of religion from the perspective of the relationship between religion and many factors; after that, we analyse religion's interaction with cultural evolution and institutional change; finally, we briefly discuss the evolution of church-sect.

I. The Origins of Religion

Compared with explanations offered by the anthropology of religion, the psychology of religion, the sociology of religion, or the phenomenology of religion, the economics of religion places greater emphasis on the role and effects of the earliest religion (primitive religion) in promoting intragroup cooperation. That is, religion's ability to enhance cooperation among members of a group is regarded as the primary driving force behind the origin of religion (Steadman & Palmer 2008; Wilson 2004). This section primarily presents several arguments proposed by Michael McBride (2023).

1. Earliest forms of religion could enhance cooperation and provide evolution advantages

McBride notes that determining when religion first appeared in human groups is difficult, because we cannot reconstruct the exact conditions under which religion first emerged, and scholarly conclusions continue to shift as

new evidence becomes available. The best currently available evidence traces the emergence of religion to somewhere between 30,000 and 70,000 years ago. This time frame helps us understand the earliest forms of religion, its connection with morality, and its potential role in early human evolution (McBride 2023, p. 295).

There is no evidence that pre-*Homo sapiens* species believed in supernatural beings, engaged in formalized ritual practices, or possessed sacred concepts. Although they did display certain forms of cooperation—such as meat sharing and cooperative breeding—they appear not to have had religious beliefs. Only with *Homo sapiens* did the earliest forms of religion arise, and these forms may have promoted cooperation in the small groups in which early modern humans lived, thereby contributing to the global dispersal of our species. Early *Homo sapiens* were primarily hunter-gatherers, living in small groups of 15–100 genetically related and unrelated individuals. Their social norms enforced economic and social equality. These small-scale egalitarian groups had no formal leaders, group membership was fluid, and social norms were crucial for sustaining cooperation. Such groups did not possess formal institutions capable of enforcing prosocial behavior; the execution of such behaviors depended entirely on group members' ability to identify and punish norm violators. Evidence suggests that religion may have expanded the scope of social cooperation and thus enhanced the evolutionary fitness of groups that possessed religious practices (McBride 2023, pp. 295-296).

McBride identifies three main early religious forms—animism, ancestor worship, and shamanism—and argues that these forms originally spread widely because they provided evolutionary advantages, namely: they strengthened cooperation among those who shared the same religious practices. These religious forms helped create, maintain, and promote cooperative norms within groups, thus improving the evolutionary fitness of participants (McBride 2023, pp. 297-301).

Animism integrated the non-human natural world into human social life. It served to constrain the selfish behavior by individuals or households. Excessive exploitation of natural resources (e.g., overhunting) could jeopardize the group's long-term survival; thus individuals faced a prisoner's dilemma regarding resource extraction. The beliefs and rituals associated with animism played a crucial role in promoting restraint and norms of sharing.

In ancestor worship, the reverence and respect for deceased ancestors (including the careful burial of the dead and the offering of sacrifices) allows ancestors to play a vital role in maintaining social harmony. Generally, ancestors were believed to reward prosocial behavior and punish violators of social norms. These beliefs encouraged cooperation among group members, increased the frequency of intragroup exchanges, and reduced violence.

In shamanism, shamanic practitioners acquired knowledge through interactions with the spirit world to benefit the community. Shamans typically underwent years of training, learning the proper and most effective methods of communicating with the spirits. They might communicate with deceased ancestors to understand their wishes, consult ancestral and animal spirits before hunting expeditions to determine the best hunting locations, or be asked to speak with ancestors on behalf of sick members to determine if the illness is a result of violating social norms. Thus, shamans played a vital role in promoting harmony and cooperation among community members and upholding social norms.

Thus, the evolutionary advantages of these early forms of religion were specific to the small-scale human societies that lacked political and legal institutions. In such environments, any innovation—such as religion—that provided additional mechanisms for promoting prosocial and cooperative behavior conferred evolutionary benefits. Accordingly, religious forms that strengthened cooperation were more likely to survive evolutionary pressure, while those that did not promote cooperation were less likely to persist.

From the perspective of strategic interaction, when actors interact with partners who share the same religious beliefs, they are more confident that the other party will be a trustworthy partner. Therefore, religion can serve as a reliable signal for identifying the type and trustworthiness of others, thereby increasing the likelihood of reciprocal cooperation and improving evolutionary fitness. Furthermore, religion provides a narrative framework for actively teaching prosocial norms within the group, fostering shared knowledge among group members about appropriate behavior for group interactions, thus increasing the probability of cooperation. Ultimately, groups that follow the same cooperative norms and achieve high levels of cooperation will disseminate these cooperative behaviors within the group over time.

2. Questions

McBride acknowledges that the argument that the earliest religions provided an evolutionary advantage also faces some criticism (McBride 2023, pp. 301-302). One criticism is that early religious forms were not always closely linked to morality, and in such cases, some earliest forms of religion may not have offered any evolutionary advantage. Another criticism is that evolutionary pressures vary dramatically across different times and places: in some environments, non-religious social norms are sufficient for evolutionary success; but in others, religion that enhances cooperation has an evolutionary advantage. These criticisms imply that the connection between religion and morality can differ among different hunter-gatherer groups.

McBride points out that neither side in the debate is likely to find conclusive evidence. Many potential forces may have contributed to the success of cooperative forms in evolutionary environments. Although we cannot determine exactly which factors promoted cooperation in humanity's distant past, we can still identify a wide range of factors that may have existed in early human life that facilitated social cooperation.

From an evolutionary standpoint, the origin and subsequent evolution of religion are essentially the same analytical problem. Research on religious evolution across later societies—examining relationships between religion and group size, cooperation quality, social complexity, and competition—can retroactively support explanations for the origin of religion. If early human groups reached a threshold in terms of cooperation scale, cooperation complexity, and intergroup competition, they may have needed to develop certain earliest forms of religion rather than relying solely on nonreligious norms in order to gain evolutionary advantages. In this sense, while nonreligious norms may indeed have sufficed in earlier hominin societies, the emergence of religion among *Homo sapiens* can be understood as a critical evolutionary accelerator. Over time, these early accelerators became internalized into human cognition and social life, enabling religion to occupy a continuous and significant place in human societies. Meanwhile, religious concepts and forms continued to evolve in response to changing cooperation demands.

II. The Relationship Between Religious Evolution and Social Scale

It is widely recognized that the formation and evolution of religious norms (and consequently religions) are highly correlated with the way social groups are constructed and their scale.

1. Social Norms and Social Group Building

In real society, individuals are invariably embedded in a large society with multiple relationships. The relationships between people are not always fixed transactions and repeated games; rather, their cooperation and exchange partners change frequently. In such a complex interpersonal environment, human societies require the development of specific social norms to promote cooperation among members (Zhang 2023, pp. 148-153).

From the perspective of punishment mechanisms, boycott (third-party punishment mechanism) is a social norm. Boycott means that every member of society should act with honesty and cooperation, refrain from deception, and assume a responsibility to punish those who deceive. If a member fails to punish a deceiver, that member will also be punished by others.

Boycott is very similar to the everyday "friend-enemy rule". According

to the rule, everyone begins as a friend, but whether a person remains a friend in the next game depends on their behavior in the previous game: if a member did not deceive anyone and did not cooperate with any of one's enemies, he/she remains a friend; conversely, if the member cheats any friend, he/she becomes a permanent enemy. Intuitively speaking, the friend-enemy rule means that if you deceive anyone, you become the enemy of everyone, given that everyone else follows this rule. The friend-enemy rule can be simplified to: (1) a friend's friend is a friend; (2) a friend's enemy is an enemy; (3) an enemy's friend is an enemy. Bendor and Swistak(2001) proved that if individuals sufficiently value the future, the "friend-enemy rule" is not only a Nash equilibrium strategy but also an evolutionarily stable strategy, meaning that those who adopt this strategy are most likely to survive in social competition, and the evolutionary result is that the whole society becomes a cooperative society.

Another mechanism for maintaining cooperation among people in a large society is "joint liability," in which a group becomes collectively punished for the wrongdoing of any one of its members. Some forms of joint liability arise naturally—for example, those based on kinship, location, or even nationality. However, a large amount of joint liability stems from the organizational design. For example, joining a community organization is equivalent to obtaining a "social seal of approval," a kind of credibility certification, but the misconduct of an individual member can damage the credibility of the community as a whole, thus leading to group punishment.

In modern economics, one way to solve the problem of asymmetric information is to divide society into different organizations or communities whose members bear joint responsibility for one another to a certain extent. In this way, social norms can operate through community norms and industry/professional norms (Zhang 2023, p. 353). Joint boycotts, friend-enemy rules, and joint liability all function similarly.

Thus, the formation and internalization of social norms are linked to the categorization and construction of social groups; that is, social norms and their internalization lead to the distinction between our group and other groups. Simultaneously, the categorization and construction of social groups reinforce in-group favoritism, thus strengthening the internalization of norms within groups. The same logic also applies to religious norms and their internalization, and the construction of religious groups.

2. The Relationship Between Religious Evolution and Social Scale

On the one hand, the construction of social groups results from the development of increasingly large (in a relative sense) societies; but on the other hand, the distinction between our group and other groups also raises the

issue of cooperation between groups, and even the construction of larger-scale social communities. In fact, in-group favoritism and out-group hostility are a possible source of conflict between early human groups (Choi & Bowles 2007). In-group favoritism leads people to show higher prosocial behavior toward members of their own group than toward outsiders (McBride 2023, pp. 305-306). Therefore, as human societies expand into larger and more complex cross-social group communities, social norms and religion need to develop and evolve simultaneously. That is, religious evolution and group-size expansion thus have a mutually reinforcing relationship.

(1) The relationship between the formation of moral religions and group scale

Numerous studies suggest that deities in the hunting era were not particularly concerned with moral issues. For example, ethnologist L. Marshall (1962) observed that among the San people of the Kalahari Desert, “Man's wrong-doing against man is not left to Gao!na's (the name of the local god) punishment nor is it considered to be his concern. Man corrects or avenges such wrong-doings himself in his social context.” Similarly, Ara Norenzayan (2013, pp. 121-123) mentions that the Hadza were the last hunter-gatherer society, with a total of about 1,000 Hadza-speaking people scattered across approximately 4,000 square kilometers of territory along and around Lake Eyasi in northern Tanzania, East Africa. The Hadza had a creator god named *Haine* who cares little about human morality.

In other words, while the universal connection between morality and religion is taken for granted in modern world religions, historically this connection emerged quite late. Many scholars attribute this development to changes in social scale.

Robert Wright, in *The Evolution of God* (2009), attributes the rise of religion to its ability to enhance social stability, arguing that religion began to evolve during the transition from hunter-gatherer societies to settled agricultural societies. “This sort of laissez-faire law enforcement is a shakier source of social order in chiefdoms than in hunter-gatherer societies. In a small hunter-gatherer village, you know everyone and see them often and may someday need their help. So the costs of getting on someone's bad side are high and the temptation to offend them is commensurately low. In a chiefdom, containing thousands or even tens of thousands of people, some of your neighbors are more remote, hence more inviting targets of exploitation.....In this phase of cultural evolution—with personal policing having lost its charm but with government not yet taking up the slack—a supplementary force of social control was called for. Religion seems to have responded to the call. Whereas religion in hunter-gatherer societies didn't have much of a moral

dimension, religion in the Polynesian chiefdoms did: it systematically discouraged antisocial behavior.....Believing that anyone you mistreat might haunt you from the grave could turn you into a pretty nice person.” (Wright 2009, pp. 55-57)

Nicholas Wade argues in *The Faith Instinct* (2010) that from an evolutionary perspective, religion is a system that emotionally links belief and behavior. In this system, a society negotiates with supernatural agents through prayer and offerings, receiving instructions from them to govern its members. Fear of divine punishment compels them to sacrifice their own interests for the common good. Religion is an evolutionary behavior that prompts individuals to prioritize collective interests over personal ones. It imposes moral intuitions, instilling a deep fear of the consequences of violating these intuitions. In hunter-gatherer religions, all members of society participated equally in interactions with the gods. However, by the Neolithic period, around 10,000 years ago, as the population continued to increase, social hierarchy replaced the egalitarian system of hunter-gatherers. A priestly official class emerged between humans and gods, monopolizing religious rights. This priestly class held supreme power in organizing religious activities, elevating their status through monopolizing contact with supernatural deities. The priestly class became the cornerstone of ancient kingdoms, and the rulers of these kingdoms became theocratic kings (Wade 2010, Chinese translation 2017, pp. 15, 38, 173).

Robert N. Bellah, in *Religion in Human Evolution* (2011), argues that play is crucial in the evolution of religion, and shared intentionality is fundamental to human cooperation. Play cannot exist without shared intentionality; players express their readiness to play, not fight or do anything else, through various means. Ritual evolved from play, requiring shared intentionality and attention. The intention of a ritual is to celebrate the solidarity of the group, attending to the feelings of all its members and probably marking the identity of the group as opposed to other groups. The intensity of the emotions evoked by a ritual leads to what Durkheim called a sense of the sacred. As Johann Huizinga notes, people become aware of “a sacred order of things” in rituals, and Geertz defined religion as providing a model of “a general order of existence” (Bellah 2011, pp. 90-96). It goes without saying that concepts such as shared intentionality, shared attention, sacred order, and a general order are all related to the scale of the social community.

Norenzayan points out even more explicitly that the emergence of prosocial “Big Gods” is a consequence of expanding human groups whose membership increasingly consisted of strangers. He argues that in early small-scale human groups—where relatives and close friends make up the majority—cooperation relies primarily on inclusive fitness and direct

reciprocity. Only when societies expand to include large numbers of non-kin and unfamiliar individuals do prosocial religious norms become necessary. Thus, the rise of large-scale communities and the rise of prosocial, moralizing Big Gods are not coincidental; rather, the latter provides the conditions and possibilities for sustaining cooperation among members of large groups (Norenzayan 2013, pp. 6-8.).

In other words, there is a correlation between the size of a society and the type of deity it worships. Small-scale societies have small gods, while large-scale societies have Big Gods. The power of small gods is limited and localized, unable to extend to other groups. In contrast, Big Gods are often described as omniscient, omnipotent, and omnipresent, extending to all of humanity rather than being confined to a single local group. It is precisely the emergence of religious communities centered around such Big Gods that enables societies to expand in scale and increase in complexity. Small-scale societies are able to maintain social cohesion without Big Gods because social life occurs primarily within the small group, where repeated interactions and social norms alone are sufficient to sustain prosocial behavior. However, many interactions in large societies are anonymous or infrequent, which necessitates Big Gods to enhance cooperation among people. If an individual's actions are unlikely to be observed or punished, they are more likely to act selfishly. But if they believe in a Big God who can observe all behavior and threaten to punish their selfishness in the afterlife, they are more likely to engage in prosocial activities, even if the probability of such anonymous interactions being observed by other members is low. When more powerful gods emerge—demanding devotion and endowed with the ability to reward moral behavior and punish immoral behavior—society becomes capable of expanding in scale despite anonymity and infrequent interactions (Shariff & Norenzayan 2007; Norenzayan 2013).

Norenzayan (2013, p. 124) further concludes that as human societies evolve from small-scale groups into larger and more complex communities, religion has shown the following evolutionary characteristics: (1) gods have become more and more common from being relatively rare; (2) religion and morality have become more and more intertwined from being basically disconnected; (3) group norms (e.g., prohibitions against deception, selfishness, adultery, and dietary taboos) have gradually strengthened, and the effectiveness of supernatural punishments (e.g., redemption, eternal curses, eternal karma, and hell) has also increased; (4) rituals and other credible displays of belief have become more and more organized, unified, and regularized.

(2) The relationship between formal religion and group size

If a religion possesses organization, unity, and ethical norms, it develops into a formal religion. Among organized religions, Judaism, Christianity, and Islam—the three major Abrahamic monotheistic religions—display striking characteristics. All three emerged in the Middle East between 606 BCE and 622 CE, and subsequently spread rapidly and prominently across North Africa, Asia, and Europe, in parallel with the rise of centralized governments. According to Murat Iyigun (2015, pp. 33-35), until the 8th century AD, societies primarily adhering to one of the three Abrahamic monotheistic religions accounted for about 15% population of the Old World; however, by the year 2000, 161 countries worldwide primarily adhered to one or more of the three monotheistic religions, representing 86% of 188 countries and a population of nearly 3.3 billion, approximately 55% of the world's population (Iyigun 2015, pp. 33-35).

Scholars have offered many explanations for the rise of Christianity in the Roman Empire and eventual establishment as the dominant religion of the Western world. The 18th-century historian Edward Gibbon, in his monumental *The History of the Decline and Fall of the Roman Empire*, identified five causes for the growth of early Christianity: the devotion and fervent zeal of Christians, Christian doctrines concerning the afterlife, the miraculous power of the early church, the pure and rigorous character of Christians, and the internal unity and discipline of the church. moreover, Roman conquests prepared the ground for and accelerated this process (Gibbon, Chinese translation 2011 Vol.1, pp. 248-249, 303). In 1996, Rodney Stark further argued that the Christian community's compassion and indiscriminate aid during natural disasters (plagues), and their respect for women and infants, were the fundamental reasons for the sustained population growth of Christian communities (Stark 1996, Chinese translation 2005, p. 2).

In *War, Peace and Prosperity in the Name of God* (2015), Iyigun analyses the driving forces behind the development of the three major Abrahamic monotheistic religions. His analysis largely illuminates how monotheistic expansion interacts with social scale, and thereby also sheds light on how other formal religions evolve dynamically with group size. In the book, Iyigun summarizes several common characteristics of Abrahamic monotheism that contributed to the growth in the number and proportion of monotheistic believers (Iyigun 2015, pp. 36-40).

First, there is the scale economy advantage of religious services. Judaism, Christianity, and Islam all acknowledge and proclaim the existence of one supreme God. This implies high barriers to entry in the religious market, thus enabling monopolistic power and increasing returns to scale in providing

religious services . For example, research by Eklund et al. indicates that the fixed costs of establishing a religion affect the scale of the faith equilibrium that a society or state can maintain (Ekelund et al.1996; Ekelund et al. 2002). When the cost of establishing a religion is high, state religions are more likely to emerge. Conversely, when multiple gods exist, the barriers to entry into the religious market are significantly lower. When monotheism dominates the market, the cost of entry is relatively high. Potential competitors seeking to enter the medieval religious market faced a formidable challenge: convincing potential adherents that their alternative product was more reliable than that offered by institutions endorsed by an omnipotent God. As long as monotheism possesses scale advantages in the religious market, it is more likely to achieve a monopoly in supplying religious goods within the political system. As a result, monotheistic churches, as widespread and pervasive monopolists in medieval society, possessed a significant advantage in producing the spiritual goods of salvation.

Second, there is accountability cum personalized spiritual exchange. In polytheistic beliefs, multiple gods govern various aspects of secular life, but there is no single deity who controls all aspects of secular and spiritual life. In contrast, monotheistic beliefs involve an omnipotent God who governs the entire universe and expects everyone to fulfill his will, thereby requiring personalized participation and communication. For example, Stark provides a functionalist analysis of the psychological and social effects of monotheism (Stark 2001, pp. 15-19). He argues that the individual accountability to God is a unique feature of monotheism. Because the relationship between God and the individual is both personal and extends to the afterlife, there is a strong purpose of exchange based on personal commitment. In the pursuit of afterlife rewards, people are willing to accept an exclusive exchange relationship, meaning that one can only exchange with a single specific God, and the greater the scope of this deity, the more likely it is to provide afterlife rewards (Stark & Finke, Chinese translation 2004, p. 344).

Third, the existence of an afterlife broadens the timeframe for exchange. Belief in an afterlife is not unique to monotheism, but Final Judgment is unique to the Abrahamic faiths. On that day, individuals must be held accountable for their behaviors before God and receive judgement from God. Essentially, afterlife rewards serve as compensation for an individual's worldly actions and can partially substitute for material goods that might be unattainable in this life. Individuals are accountable to God for their actions in this life, and their rewards are often only received after death. Stark points out that this longer time horizon of exchange relationship "is a major factor allowing godly religions to generate long-term levels of commitment necessary to sustain strong religious organizations" (Stark 2001, p. 19).

Fourth, the belief in a single God provides a motivating factor for resisting external non-believers. Judaism, Christianity, and Islam are all founded on the fundamental belief of “one God and one religion,” a dualistic concept known as particularism. Real or imagined external enemies foster cohesion, compromise, and unity within a society. As Karen Armstrong observes, monotheistic beliefs are unique in their mutual exclusion, especially in their insistence on worshipping only *one* God, while polytheism has historically been more tolerant than monotheism; as long as the old sect is not threatened by a new deity, there is always room in the pantheon for yet another deity (Armstrong 1993, p. 49).

Furthermore, Iyigun points out that when competition and conflict are considered, it becomes easier to see that net conversion flows favor monotheism over polytheism. As long as the net conversion probability into monotheism is strictly positive, one can readily demonstrate that, over time, all other faiths will become monotheistic (Iyigun 2015, p. 433).

III. The Relationship Between Religious Evolution and Other Social Factors

In the above discussion, social size has been considered as an influencing or influenced factor in religious evolution (i.e., an independent or dependent variable). However, social size itself is also related to the complexity within society, including social factors such as competition (conflict and war), politics, and economics. Therefore, religion also has a dynamic evolutionary relationship with other social factors.

1. The Evolutionary Relationship Between Religion and War

The relationship between religion and warfare exhibits complex diversity, which has led to divergent findings and conclusions among scholars.

In 1960, L. F. Richardson, using data on more than 300 violent conflicts worldwide between 1820 and 1949, was the first to reveal that religious differences—especially those between Christianity and Islam—were a cause of war. Richardson found that in his statistics, not a single conflict arose because the parties shared the same religion; nor did he find any conflict limited by the differing beliefs of the participants. Instead, conflicts arose and persisted primarily because of religious differences, or were quelled or ultimately contained mainly because the participants were followers of the same religion (Richardson 1960, p. 239).

However, researchers at the University of Bradford in the UK examined 73 major historical wars and found that religion played a particularly important role in only three of them: the Arab Expeditions (632-732), the Crusades (1091-1291), and the Reformation conflicts between Protestants and

Catholics. They discovered that 60% of the wars were completely unrelated to religion (Wade 2010, Chinese translation 2017 p. 235).

In Samuel Huntington's *The Clash of Civilizations and the Remaking of World Order*, he argues that religion is a core characteristic of civilization. He divides the world into several major civilizations: Sinic, Japanese, Hindu, Islamic, Orthodox, Western, Latin American and African (possibly). These civilizations have different histories, languages, cultures, traditions, and, most importantly, different religions. He believes that each society utilizes its religion for its own purposes, and that civilizational conflicts will be the dominant form of future conflict (Huntington 1996, pp. 45-55). However, many scholars and politicians oppose Huntington's assertion.

2. The Evolutionary Relationship Between Religion and Politics

The religious market theory, based on neoclassical economics, argues that government regulation has a significant impact on the development of the religious market (Stark & Finke, Chinese translation 2004, p. 245). However, the dynamic relationship between religion and politics is far more complex than simple religious regulation. For example, Stark, a representative scholar of the religious market theory, has pointed out that it was precisely because the proportion of Christians had continued to rise and become a significant political force that led to Emperor Constantine's Edict of Milan. Therefore, the Edict of Milan was a sensitive response to the situation at the time, rather than the cause of Christianity's dramatic growth (Stark 1996, Chinese translation 2005, p. 2).

In 1960, Guy E. Swanson conducted a study of 50 primitive societies, which was the first attempt to statistically link social structure with beliefs in a supreme god or supreme creator (Swanson 1960). His research showed that belief in a supreme god was correlated to political complexity. More precisely, he discovered and predicted that belief in a supreme god was closely related to the number of "sovereign organizations" in a society. Swanson defined sovereign organizations as stable groups with autonomous decision-making power in certain areas of social affairs. Swanson pointed out that societies that developed belief in a supreme god all exhibited a common characteristic: numerous hierarchical alliances extending from the individual to the outermost level of society. For example, among the Iroquois, the individual is part of a nuclear family, the nuclear family belongs to a household, multiple households reside in a longhouse, longhouses constitute a clan, clans form a tribe, and tribes together make up the Iroquois Confederacy. Swanson noted that the concept of a supreme god emerged when the political coordination of at least two subordinate groups was accomplished by a hierarchy higher than them.

In Jared Diamond's words: "At the end of the last Ice Age, much of the world's population lived in societies similar to that of the Fayu (hunter-gatherer) today, and no people then lived in a much more complex society. As recently as A.D. 1500, less than 20 percent of the world's land area was marked off by boundaries into states run by bureaucrats and governed by laws. Today, all land except Antarctica's is so divided. Descendants of those societies that achieved centralized government and organized religion earliest ended up dominating the modern world. The combination of government and religion has thus functioned, together with germs, writing, and technology, as one of the four main sets of proximate agents leading to history's broadest pattern"(Diamond 1999, pp. 266-267).

In 2011, Bellah argued that religion has been ubiquitous in human societies, and in early history, religion tended to affirm existing political authority. Early religious deities were powerful beings, so people naturally associated them with the secular power held by kings and chieftains. the idea of the divinity of the king persisted, with divinity and humanity merging in the king. The king, whether as incarnation, son, or servant of the gods, is the key link between humans and the cosmos. This characteristic gradually changed throughout ancient societies, only being completely broken down during the Axial Age (Bellah 2011, p. 232).

In 2017, Jared Rubin argued that rulers rely on religion to provide a readily available and low-cost source of political legitimacy. Because governments face high costs in governance—paying salaries to bureaucrats, soldiers, and tax officials while monitoring them to prevent opportunistic behavior—the emergence of moralizing Big Gods expands the scope of human cooperation and punishes misconduct to safeguard group interests. This significantly reduces the cost of governance, and political authority also requires the affirmation provided by such gods (Rubin 2017).

It is clear that religion has been a primary source of political legitimacy since recorded history. But why is religion a natural source of political legitimacy? And how does the relationship between religion and politics evolve? Noel Johnson and Mark Koyama developed a formal model to address these questions in 2013. In this model, legitimacy derived from religion can enhance the state's capacity to tax, and the state's ability to derive legitimacy from religion depends on enforcing religious homogeneity. Therefore, as rulers begin to govern a more dispersed population with diverse religious beliefs, the cost of enforcing homogeneity increases. The model further predicts that rulers' attempts to build state capacity, particularly through the implementation of uniform laws, may increase religious persecution in the short term, but result in greater religious tolerance in the long term (Johnson & Koyama 2013).

In 2019, Johnson and Koyama, building on a review of several related studies, further explored the evolutionary logic of the state, religious tolerance, and religious freedom (Johnson & Koyama 2019). They argued that in a world where religion serves as the primary source of legitimacy, the ruling coalitions of any society consist of both secular and religious authorities, whose relative positions depend on their comparative strengths.

Johnson and Koyama describe the relationship between the state and religion in the premodern era as a conditional toleration equilibrium, arguing that it is a governance mode based on identity rules in contexts of low state capacity. “Identity rules” refer to rules whose form or enforcement depends on the social identity (e.g., religion, ethnicity, or language) of the parties involved. Such rules are ubiquitous because they are a low-cost form of governance; low state capacity and identity rules mutually reinforce each other (Johnson & Koyama 2019).

Rulers govern according to identity rules, where different rules apply to different religious and ethnic groups. These identity rules generate economic rents that help rulers maintain political power. Sometimes, reliance on identity rules leads to widespread religious violence; in normal times, it contributes to peace and a de facto form of religious toleration, but this equilibrium is not genuine religious freedom. For example, the Jewish community has existed in Europe since Roman times. Jews received protection from secular rulers, but they also faced discriminatory laws forbidding them from carrying weapons and sometimes requiring distinctive clothing or badges. Johnson and Koyama also cite evidence from Anderson et al. (2017), showing that the equilibrium of conditional tolerance can collapse under economic pressure. For example, during difficult economic periods, European rulers found it far harder to credibly commit to protecting Jews.

Johnson and Koyama argue that in regimes that rely on religion for legitimacy, the lack of religious freedom is closely linked to the dependence on identity rules. Weak secular authorities depend both on religion as a source of political legitimacy and on identity rules for governance. In particular, lacking the administrative and legal capacity to enforce general rules and ensure equality under the law, they rely on the lowest-cost form of governance: utilizing existing religious or national identity rules. This **conditional toleration equilibrium** has dominated religious affairs in Europe for over a thousand years. It was only after 1500 that continuous social development led to the collapse of the conditional toleration equilibrium. The religious changes brought by the Reformation interacted with developments in military technology and led to the rise of stronger states such as the Dutch Republic, England, and France. The legitimacy of these larger and more powerful states no longer depended on religion. As these states established their own taxation

and law enforcement agencies, they gradually abandoned identity rules and increasingly relied on more universal behavioral rules. This was a gradual process, one that allowed policymakers to see the possibility of an alternative form of government: a secular state, governed by general rules and constrained by the rule of law, rather than justified through religious authority. Attempts to establish governance based on general rules contributed directly to the emergence of religious freedom—which in turn played a crucial role in the rise of liberalism. As Rawls stated, “Liberalism originated in the sixteenth and seventeenth centuries; it developed in conjunction with various debates over religious tolerance.” (Rawls, Chinese translation 2011, p. 280)

3. The Evolutionary Relationship Between Religion and Economy

Economics is another important factor influencing the evolution of religion, and it is often closely linked to war and politics. Jean-Paul Carvalho and others concluded in 2019 that, undeniably, religion and the state may be the two most important social institutions created by humans. How religion interacts with the political economy of the state is one of the fastest-growing fields in political economy in recent years, with a series of influential studies in theoretical, empirical, and economic history work (Carvalho et al. 2019).

As early as 1975, Ralph Underhill used Murdoch’s cross-cultural data to conduct research and showed that belief in the supreme God is related not only to political complexity but also to economic complexity, and that economic complexity is the more important of the two (Underhill 1975).

In 1987, R. D. Alexander proposed his theory of the evolution of morality, arguing that social size, moral systems, and the complexity of social, political and economic organization are all responses to competition with other societies and to maintaining a balance of power among them (Alexander 1987). He points out that human social groups become large because of inter-group competition for habitats and resources. While larger social groups are more successful in such competition, they also face greater pressure toward fragmentation. Moral problems stem from conflicts of interest, and moral systems exist to address inter-group conflicts of interest through the convergence of interests within the group. In this framework, moral systems are described as indirect reciprocity systems, where moral rules are established to impose rewards and punishments to influence social behaviors that help or harm others. Morality unites society and reduces division by limiting violations of the rights of other members. Large, intact societies may have more effective, inviolable moral rules, such as rules in which a moral deity imposes rewards and punishments.

Several cross-cultural analyses support Alexander’s idea. For instance, the study carried out by Frans L. Roes and Michel Raymond in 2003 found

that in resource-rich environments—where inter-group competition is more intense—larger-scale societies tend to dominate such environments. Larger societies participate more frequently in external conflicts and are more likely to exhibit the characteristics of belief in moralizing gods (Roes & Raymond 2003).

The dynamic relationship between religion and economics is also reflected in the ability of religious organizations to provide public goods. For example, Johnson and Koyama argue that religious authorities played an important role in all premodern societies largely because they provided public goods that the state could not. A classic example is the Catholic Church in medieval Europe, which provided welfare, healthcare, and education. Because of this, the Church was able to influence believers and encourage obedience to political authorities. They also emphasize that religious organizations excel at providing many public goods because they have developed institutionalized practices, such as strict rituals and rules, which allow them to screen out free riders and address problems of moral hazard and adverse selection (Johnson & Koyama 2019).

4. A comprehensive analysis of religious evolution and various social factors

The above discussion explored the relationship between various social factors such as war, politics, and economics, and the evolution of religion. In actual history, however, these factors are often intertwined and difficult to distinguish from one another. Therefore, related research rarely focuses on a single social factor, as demonstrated above. Indeed, many works aim to integrate multiple social factors into a unified analytical framework. Here, we introduce a multi-actors game-theoretic model constructed by economist Jared Rubin in 2017.

In his book *Rulers, Religion and Riches: Why the West Got Rich and the Middle East Did Not*, Rubin constructs a complex game-theoretic model to explain why religious legitimacy (the legitimacy of political authority derived from religion) varies across different societies. The model analyses the behavioral choices of participants in different environments, starting with the incentives they face in negotiating laws and policies (Rubin 2017, pp. 28-72).

As shown in Figure 1, this model assumes that the universal objective of a society's political authority is to remain in power, and its various agents, based on their respective identities or resource channels, can help the ruler remain in power. Generally, political authority has two means to maintain power: legitimacy and coercion. Correspondingly, the agents who assist the ruler remain in power fall into two categories: legitimacy agents and coercion agents. Coercion agents use violence to drive people to follow the ruler ;

legitimacy agents use legitimacy to make people follow the ruler, that is, to persuade people to believe that the ruler has legitimate power. Both types of agents can bring huge benefits to the ruler, but the latter also has to pay a cost : the ruler must grant them a seat at the bargaining table in exchange for their support. The legal and policy outcomes generated through this bargaining process thus reflect the relative bargaining power and preferences of each participant.

In this game-theoretic model, the participants include three classes of actors: political authorities, all possible agents, and citizens or non-elites. It is important to note that even those agents not actually chosen by the rulers still play a significant role in the game because they represent the external options available to the rulers. Although most policies are the result of bargaining among elites (agents), citizens exert a crucial influence on all parties. Without the support of citizens, rulers cannot remain in power; and if agents lose their influence over citizens, they likewise lose the ability to sustain political authority.

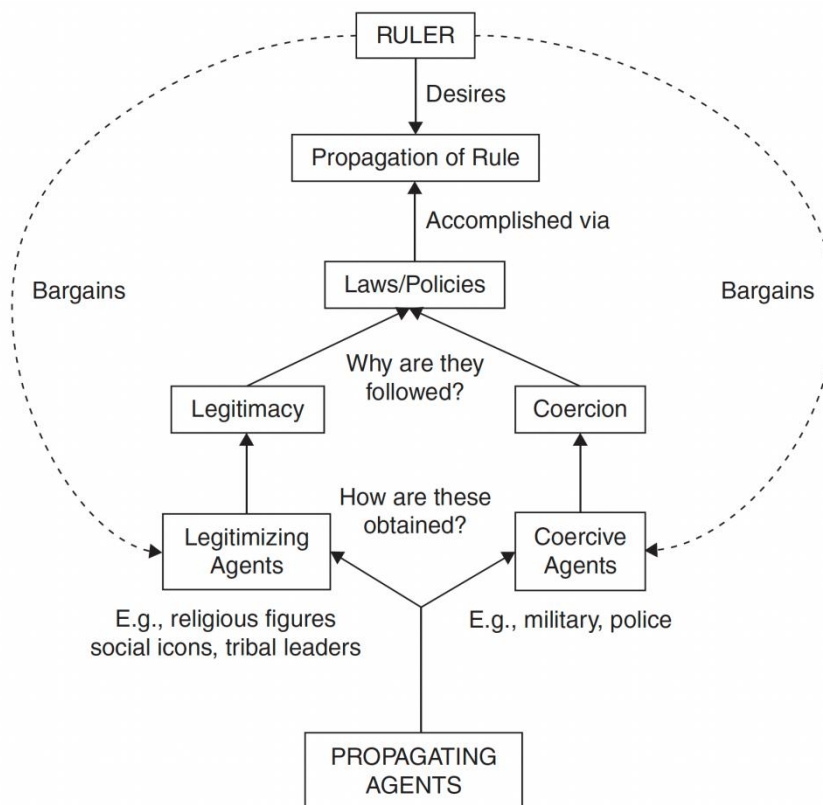


Figure 1: How rulers propagate rule

The objectives of the various participants differ. The ruler's goal is to remain in power. The goals of the agents, however, depend on their identities: military elites typically seek policies that increase military expenditures, promote conquest, or enhance the state's capacity to tax; economic elites

generally support policies that increase their own wealth; and religious authorities usually desire tax exemptions, policies compliant with religious doctrines, and the suppression of rival religions.

All participants must obtain something from their interactions with one another; otherwise, the game cannot proceed. The benefits to rulers are obvious: agents support their political authority and help them remain in power. Agents, in turn, receive the returns they desire. For example, rulers may enforce religious laws or suppress rival religious movements to maintain good relations with religious institutions. Many pre-Reformation European kings acted in this way, assisting the Church in suppressing heresy.

The implementation of policies ultimately depends on the ruler's selection of agents and the bargaining power of these agents. Understanding policy outcomes requires answering several key questions: How many agents does the ruler need to propagate and maintain political authority? Can agents effectively perform these tasks at a relatively low cost? Does the ruler have other good alternative sources of promotion and maintenance? What determines the relative costs and benefits of different laws and policies?

A key component of the game-theoretic model is the external, or exogenous, factors that influence participants' incentives. Among these, the most important factor is social institutions, which constrain human behavior. These constraints shape behavior because they affect the costs and benefits associated with alternative actions. When the rules of the game align religious doctrine with the legitimacy religion provides to the ruler, rulers will be more likely to resort to religion.

Assuming these institutional rules are fixed, all participants tend to form equilibrium behaviors, and the equilibrium outcome is determined by their relative bargaining power.

If agents are highly effective or low-cost, they are in a favorable bargaining position. In such cases, agents can threaten to withdraw legitimacy, depriving rulers of an essential source of political authority. If this threat is credible, rulers will make substantial policy concessions to these agents—even if such concessions reduce the ruler's chances of remaining in power.

The game becomes more complex when the preferences of agents diverge from those of the citizens. In this scenario, rulers must choose between supporting their legitimacy-providing agents and implementing policies that benefit the citizens. When rulers choose to support the policies favored by agents, citizens who violate these policies face "double punishment"—they may be sanctioned both by the ruler and by the legitimacy-providing agents. For example, in Saudi Arabia, any individual who violates legal rules concerning women's behavior may face religious sanctions from clerics as well as imprisonment or fines from the state. This dual punishment diminishes

citizens' incentive to push for such rule changes in the future, creating a cycle where, over time, citizens have little motivation to drive change; once arguments for reform disappear from public discourse, society may even forget that they existed. Consequently, pushing for rule changes may no longer even be a citizen's preference, and rulers and agents no longer need to bargain over such laws and policies because these are not matters of public concern.

Religious legitimacy is especially attractive to rulers because it is inexpensive. Religious authorities have historically been among the most important legitimizing agents. In medieval Europe, for instance, the Catholic Church could transform kings into emperors. When religious authorities possess the capacity to legitimize political rule, rulers will rely on them. In such environments, rulers will lack incentives to change laws in response to changing social conditions if doing so would threaten religious authority. Existing policies are likely to reflect religious doctrines and reinforce the power of religious authorities, who prefers policies aligned with religious teachings because such laws make it easier for them to maintain moral authority among the populace.

Rubin also cites an interesting example provided by Eric Chaney. Chaney's study of Islamic Egypt between the 12th and 14th centuries shows that when the Nile's water level fell far below normal (indicating drought) or rose far above normal (indicating flood), the likelihood that religious authorities would be replaced decreased. These were times of food scarcity, when rebellion was most likely. The benefits of religious legitimacy were greatest under such conditions because religious authorities could discourage people from rebelling. As a result, in years when Nile water levels were unfavorable, religious authorities possessed greater bargaining power in legal and policy negotiations (Chaney 2013).

Rubin argues that although rulers in both Western Europe and the Middle East historically relied on religious legitimacy, their trajectories diverged due to two key factors.

The one factor was the rise of commerce in Western Europe—the so-called “Commercial Revolution.” From the 10th to the 13th centuries, economic development and the rise of a new bourgeois class created incentives for European rulers to bring this new class into political negotiations (even if for no other reason than to obtain tax revenue). The rise of bourgeois power was primarily manifested in burgeoning parliaments, at the expense of the Church. However, despite the Middle East's substantial economic advantages over Western Europe in the centuries following the rise of Islam, this political transformation never truly occurred there. Middle Eastern commerce did not weaken the role of religious authorities in legitimizing political rule because

Muslim religious authorities were particularly effective at providing legitimacy. Any action that might undermine it (including bringing alternative sources of legitimacy to the negotiating table) could threaten the ruler's ability to legitimize their rule. In other words, the cost to Middle Eastern rulers of losing religious legitimacy was far greater than that to their Western European counterparts.

Another was the Protestant Reformation. The Reformation spread to England, Scotland, the Netherlands, Scandinavia, and parts of the Holy Roman Empire and Switzerland, making religious legitimacy no longer an option for rulers. Where reformers succeeded, reformed churches replaced Catholicism, and many of these churches were under state control (as in England and Sweden, where the establishment of state churches coincided with the spread of the Reformation). These churches could not provide legitimacy because their discourse was not independent of the state and could not increase credible information about "ruling power." Therefore, rulers tended to resort to parliament to legitimize their rule.

Rubin also emphasized the key difference between religious authority and other types of agencies: religious authority can provide a relatively consistent interpretation over a longer period, which is extremely valuable for rulers. If a large number of citizens openly contradict the religious authority's position on a particular issue, the religious authority will lose credibility and thus its ability to sustain political power. In such cases, the religious authority will have a short-term incentive to update its views, that is, to approach and maintain relevance to the citizens by modifying or reinterpreting its doctrines. However, such reinterpretations impose greater long-term costs: they undermine the very basis of religious authority's power. Over time, those religious authorities with a weaker ability to continue ruling will become more vulnerable. This process may continue until the rulers exclude them entirely from the set of agents used to remain in power.

However, when religious authorities are highly effective at legitimizing political rule, this long-term erosion does not occur. In such cases, citizens are unlikely to disobey religious commands or challenge religious authorities, because doing so would incur extremely high costs. Therefore, religious authority never faces pressure to reinterpret doctrines. This means that the legitimizing relationship between religious authorities and rulers is strengthened over time.

IV. Religious Evolution, Cultural Evolution, and Institutional Change

Religious evolution is also connected with cultural and institutional changes. This section outlines the analysis model of the joint dynamics of culture and institutions proposed by Alberto Bisin and his collaborators, as

well as its extended model.

1. A Joint Dynamics Model of Culture and Institutions

In 2019, Bisin and coauthors used the analytical approach of joint dynamics between culture and institutions to explore the phenomenon that religious power leads to changes in the institutional power structure among political elites, religious clergy, and civil society in the context of religious legitimacy (Bisin et al. 2019).

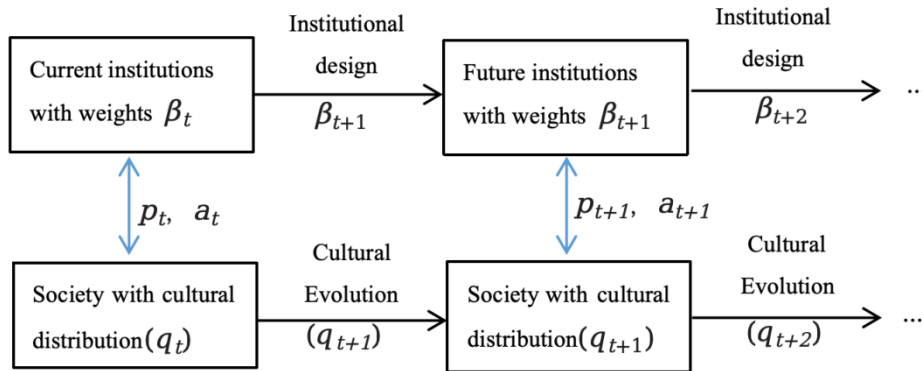


Figure 2: Joint dynamics of culture and institutions(I)

As shown in Figure 2, at a given time t , a society's cultural environment can be described as the distribution of groups characterized by different cultural traits, denoted q_t ; A society's institutions (or institutional design) can be described as the distribution of institutional weights assigned to different cultural groups, denoted β_t . Let denote a_t the set of individual behavioral choices available to all citizens, and p_t the set of possible social policy choices.

Over time, institutional system at t evolves dynamic from β_t into the one at $t+1$, β_{t+1} ; similarly, the cultural profile of society q_t evolves over time, driven by cultural diffusion and social selection processes within and across generations and influenced by the status of the institutional system, β_t . This is the joint dynamics of culture and institutions.

The joint dynamics of culture and institutions may reinforce or hinder specific socio-economic equilibrium patterns. A typical scenario operates as follows: when a society experiences an external shock whose externalities or political consequences become highly salient, the shock triggers institutional responses aimed at internalizing these externalities or selecting new policies. Consequently, political groups that benefit more from policy changes gain greater institutional weight. In this case, when the strength of the institutional response is positively correlated with the distribution of the group's cultural characteristics, and the policy change also positively impacts the group's

incentives, the two become complementary. During such institutional transitions, groups capable of securing more political power through institutional responses also see their cultural traits disseminated more widely. The broader diffusion of these cultural traits further increases the likelihood of future institutional changes that enhance the group's political power, thereby facilitating the resolution of externality problems. Over time, the dynamic development of institutions and culture reinforces each other, playing a dynamically complementary role.

Under the framework of religious legitimacy, religious actors (including clergy and believers) constitute part of the institutional-weight distribution, and religious culture forms part of the cultural distribution. The basic principles through which religion drives the co-evolution of institutions and culture can be summarized as follows: (1) Religious legitimacy can help (secular) elites solve political and economic problems related to policy implementation; in turn, this will trigger institutional changes and transform the distribution of political power between elites and religious figures. (2) The ability of religious actors to help elites implement policies depends fundamentally on how religious values are spread in society. Therefore, institutional changes related to legitimacy depend on a society's cultural characteristics concerning religious beliefs and values. (3) The spread of religious values will be promoted by institutions that grant clergy more political power. Likewise, the institutional system reflecting the power structure between elites and religious clergy will also significantly shape the cultural spread dynamics of religious values among the population.

The above framework can explain the emergence of two distinct types of societies: the first is the strong religious state, characterized by the widespread dissemination of religious norms and influential clergy capable of imposing religious constraints on the population, thereby helping political rulers seize power (ultimately at the expense of economic efficiency); the second is the secular state, where religious norms are not widely disseminated, the clergy gradually lose the economic and political influence, and civil society (merchants, workers, or the masses) ultimately gains control over production and redistribution.

Interestingly, the joint evolution of religious values and institutions largely depends on initial conditions. When religious values initially spread widely in society, institutional evolution tends to steadily increase the political power of clergy. In fact, when religious values are widely disseminated, granting clergy greater power is the most effective mechanism for reducing policy choice problems and externalities. Conversely, institutional changes that empower clergy further reinforce religious values and ultimately strengthen the ability of political elites to seize power. Alternatively, when

religious values are not initially widespread, institutional changes gradually weaken the power of both clergy and political elites, while the religious character of society diminishes.

Furthermore, the influence of a ruler's initial political power on institutional evolution also depends on the nature of the externalities arising from the social policy bargains among social groups. A powerful political elite, suffering from a lack of commitment and resulting in severe inefficiency, may find it particularly beneficial to reduce inefficiency by delegating some power to religious clergy, thereby strengthening policy assurances. Simultaneously, a powerful political elite may also address their governance issues using means beyond those provided by religious clergy, thus eliminating the need to delegate power to them.

2. Extended Model

In 2024, Bisin and coauthors (with the addition of Rubin) constructed a more refined model to examine how religious legitimacy, religious prohibitions, and limited governance shape the interdependence between a society's institutions and culture (Bisin et al. 2024). This model can be understood as an extended model built upon the joint dynamics model of culture and institutions, incorporating the Rubin model.

This model identifies three fundamental elements of the socioeconomic environment. The first element concerns the role of religious legitimacy in institutional design. The religious services provided by clergy shape the moral beliefs of civil society. Crucially, religious authorities can leverage this influence to legitimize rulers—embedding obedience to political authority within the broader moral obligations of the faith they promote. The second element is the trade-off between religious legitimacy and religious prohibitions. Clergy demand the enforcement of religious prohibitions (such as usury laws), but these prohibitions often ultimately suppress economic activity. The third element concerns the role of secular elites and limited governance in enhancing state fiscal capacity. Limited governance refers to the decentralization of power from the ruler to secular elites who wield fiscal power through the tax system.

This model analyses how power structures dynamically change when rulers, clergy, and secular elites establish institutions within a religious setting. Most importantly, it also emphasizes and analyses how institutional and the cultural transmission of religious beliefs interact when the relative dynamic power of rulers, clergy, and secular elites shifts over time.

In period t , the power distribution among different social groups is as λ_t . for simplicity, the relative power of the ruler is fixed at $1/2$; the weight of clergy in influencing social choices is $\lambda_t/2$; and the weight of civil society is

$(1-\lambda_t)/2$. The distribution of religious and secular populations is q_t , with higher values indicating a higher proportion of religious populations. The efficiency of clergy in granting legitimacy to the ruler is θ , where legitimacy primarily focuses on the legitimacy of taxation. The strictness of religious prohibitions on economic activities is ϕ .

(1) Institutional Dynamics. Institutional change refers to the changes in institutions that each generation brings about, which determine the relative power to be delegated to clerics and civil society in the future. that is , the choice of λ_{t+1} is from the point of view of the social welfare function with weight λ_t . at the end of each period t , λ_{t+1} is re-selected through the maximization of a social welfare function that include λ_t .

From the perspective of all participants at any given point in time, institutions are exogenous; however, they change over time to reduce externalities associated with policymakers' decisions. Institutional change from period t to period $t+1$ internalizes two externalities that are ignored in the optimal decision-making process of the Nash equilibrium at period t . The first externality is that religious products conferring legitimacy to the ruler, can lower the perceived tax rate among the religious population. That is, the stronger the ruler's legitimacy, the higher the acceptable tax rate for the people. The second externality is that religious products imposing prohibition inhibit labor productivity. Therefore, increasing the supply of religious products not only affects the utility of clergy but also further impacts the utility of the ruler and citizens.

The first conclusion drawn from this model is that solving the optimal social welfare function (details omitted here due to the complexity of the function and its variables) yields a unique optimal solution λ_{t+1} . This optimal solution is characterized by a threshold for population distribution $\bar{q}(\lambda_t)$ such that: $\lambda_{t+1} > \lambda_t$, if $q_t > \bar{q}(\lambda_t)$. It means the current religious population distribution exceeds this threshold, then the weight of clerics in the ruling power will increase in the next period, and vice versa. The threshold $\bar{q}(\lambda_t)$ decreases as the efficiency of religious legitimacy θ increases and increases as the intensity of religious prohibitions ϕ increases. When clergy can effectively legitimize the ruler (higher θ), the ruler finds it beneficial to delegate power to clergy, lowering the threshold $\bar{q}(\lambda_t)$ and expanding the potential for clergy empowerment λ_t ; Conversely, when the intensity of religious prohibitions increases, the cost for the ruler to acquire resources through religious legitimacy increases, increasing the threshold \bar{q} and lowering the potential for clergy empowerment λ_t ; When religious prohibitions are more unsatisfied among the secular population than among religious believers, the threshold \bar{q} decreases.

(2) Cultural Dynamics. Cultural dynamics refers to the purposeful

intergenerational transmission of cultural traits. It is achieved through the socialization influence of parents on their children (vertical transmission) and the imitation of the entire society (oblique transmission). Religious and secular families, in maximizing their respective cultural characteristic transmission utility functions, will choose the optimal level of socialization effort that matches their own circumstances. The difference in effort between religious and secular families is the relative "cultural fitness" of the religious trait which determines the population distribution q_{t+1} at time $t+1$.

Given the complementarity between religious legitimacy and religious values, the model draws a second conclusion: there exists a threshold $q^*(\lambda_t)$ such that $q_{t+1} < q_t$, if $q_t > q^*(\lambda_t)$. If the current religious population distribution exceeds this threshold, then the religious population distribution in the next period will decrease, and vice versa. The reason is that when q_t is high, parental effort will decrease, leading to a decrease in the "cultural fitness" of religious characteristics. Therefore, $q^*(\lambda_t)$ is the optimal solution when the cultural fitness equal to 0. Above (or below) this threshold, the proportion of religious individuals q_t shrinks (or expands) toward $q^*(\lambda_t)$, moving in the direction of convergence.

The threshold $q^*(\lambda_t)$ increases with θ and λ_t increase and decreases as \emptyset increases. The extent to which the threshold $q^*(\lambda_t)$ depends on the institutional environment λ_t and on the parameters θ and \emptyset is determined by how these features affect religious cultural fitness. For example, the institutional environment λ_t affects cultural adaptation through two pathways: it affect the utility of parents derive from cultural transmission preferences and it affect the role of religious infrastructure as a supplementary investment in household socialization. Both pathways shape how parents transmit cultural traits to their children. In both cases, an increase in λ_t enhances the propagation of religious cultural traits, thereby raising the threshold $q^*(\lambda_t)$.

(3) Various Scenarios. Figure 3 illustrates various scenarios of the joint dynamics of culture and institution:

A. Stable states: Point A and Point B. Point A is the first stable state, which can be described as a religious polity: the rulers are legitimized by religion, clergy have significant decision-making power (λ_t is very high), taxes are high, and the civil society is religious (q is very high). Point B is the second stable state, which can be described as a secular polity: the rulers are not legitimized by religion, clergy have almost no political power (λ_t equals to zero), taxes are limited, and the civil society is secular (q is very small).

B. Monotonic convergence paths: Regions I and IV. In these two regions, cultural and institutional dynamics are complementary. Taking Region I as an example, on the one hand, clergy provide religious services to civil society,

which shape the moral beliefs of civil society and support the moral obligation to obey the rulers, thereby lowering the perceived tax rate of the religious population. Therefore, the institutional design of the rulers delegating power to clergy (high λ_t) strengthens the incentive for the religious population to transmit their religious values, which further increases the relative share of the religious population. On the other hand, the larger the religious population, the stronger the political motivation for the rulers to decentralize power to clergy to increase legitimacy. Therefore, this complementarity subsequently generates a drive toward a religious regime (point A). Similarly, Region IV generates a drive toward a secular regime (point B). Therefore, the complementarity between cultural and institutional dynamics will lock society into one of two stable equilibria.

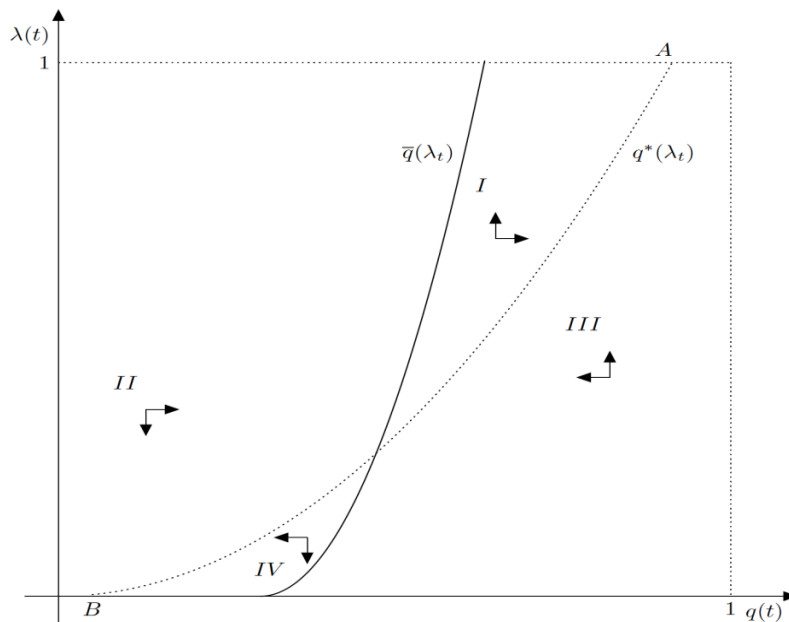


Figure 3: the joint dynamics of culture and institutions(II)

C. Non-monotonic convergence paths: Regions II and III. In these two regions, cultural and institutional dynamics are not complementary, thus the society is not monotonic; instead, a race occurs between them. The “winner” of this horse race will determine which stable equilibrium will emerge in the long run. For example, in Region II, the religious population is insufficient (lower q_t) and λ_t decreases over time. At the same time, the religious population invests more in direct socialization. Depending on the rate of institutional change relative to cultural change, the joint dynamics of the two can propel the society to Region I or IV. When the religious population grows rapidly while the political influence of clergy declines over time, Region II may generate a temporary path to equilibrium point A (i.e., first to Region I).

This could occur because religious parents, as a minority, have a greater incentive to pass on their religious cultural traits to their children. In this case, when the religious population becomes large enough at some point that the decline in institutional change λ_t is reversed, the political power of religious clergy starts regaining political power after a transitional period. In Region III, the religious population is large enough that the political power of religious clergy increases over time, but the religious population is so large that the secular population invests more in its socialization. Again, depending on the relative speeds of institutional and cultural evolution, joint dynamics may reach Region I or Region IV. If the rate of decline in the religious population outpaces the rate of increase in religious power, the joint dynamics can be expected to reach Region IV. In this case, the religious population becomes so small after the transition period that the political influence of clergy declines over time, and equilibrium point B is achieved in the long run.

Using this model, researchers attempt to provide a general approach to explain how the interaction between institutions and culture shapes social change and determines institutional trajectories. Specifically, this approach may be seen as “an illustration of the explanatory power of a class of models centered on some simple, general, and yet minimal components: i) institutions as reflective of the relative political power of different groups in society to affect policy decisions, ii) institutional change as a mechanism to internalize externalities and other distortions characterizing the equilibrium, iii) the cultural profile of values and preferences in society as evolving according to socioeconomic incentives.” Researchers also hope that this methodology can serve as a stepping stone for future theoretical and practical research.

V. The Evolution of Churches and Sects

In the study of religious organizations and beliefs, church–sect theory is perhaps the most important mid-level theory offered by the sociology of religion (Swatos 1998, p. 90). The terms “church” and “sect” are not only used to classify religious groups, but also to develop theories to explain the changing forms of religious groups over time.

The classic church–sect theory established in the early twentieth century by H. Richard Niebuhr remains one of the most influential frameworks for studying religious organizations. In his 1929 work *The Social Sources of Denominationalism*, Niebuhr viewed “church” and “sect” as two poles of a continuum of religious organization, rather than simply as discrete categories. He not only categorized groups based on relative sectarian or church similarities but also analysed the dynamic historical processes through which organizations move along this continuum, thereby describing the rich pathways connecting churches and sects (Niebuhr 1929).

Subsequently, the theoretical community shifted the focus of church-sect theory from comparative analysis tools to classification systems, applying sociological terminology to religious organizations and generating many complex types. Howard Becker developed four types: cult, sect, denomination, and ecclesia. J. Milton Yinger further expanded this to six: cult, sect, established sect, denomination, church, and universal church, and further subdivided sects based on their relationship with the social order—whether they accept, avoid, or attack the social order (Swatos 1998, p. 91). Regarding sectarian types, the four types proposed by Bryan R. Wilson in 1959—Conversion, Revolution, Introspection, and Gnosticism—remains the most enduring (Wilson 1959).

However, Stark and Bainbridge pointed out that much sociological interest in church-sect distinctions originated from the analysis of religious movements, yet typological classification often hindered theoretical development (Stark & Bainbridge 1979). This section primarily introduces the evolutionary study of church-sect.

1. The Evolution of Church-Sect from the Perspective of Tension

In 1961, Benton Johnson rethought church-sect theory, abandoning dozens of static classifications defined by various related factors. Instead, he proposed a single dimension: acceptance or rejection of the surrounding social environment. A church is a religious group that accepts its social environment; a sect rejects it. He proposed a tension axis, arguing that religious communities are a continuous unity along this axis, ranging from complete rejection to complete acceptance (Johnson 1961).

This new thinking has profoundly influenced religious market scholars, represented by Stark and his collaborators. Stark and Finke define tension as the degree of distinction, separation, and antagonism between a religious group and the “outside” world. Large churches are religious groups with relatively low tension with their social environment, while sects are religious groups with relatively high tension (Stark & Finke, Chinese translation 2004, pp. 178-181). Tension can be observed along two dimensions: the extent to which a group violates the general behavioral norms of society, and the extent to which its behaviors or characteristics attract the contempt or punishment of powerful secular elites (Stark 1996, Chinese translation 2005, p. 58). High-tension religious groups are clearly different from the value and behavioral systems of society dominated by elites. Therefore, tension is a cost for religious groups, representing the loss of secular opportunities. For religious groups to survive and develop, they must demand returns commensurate with these costs. The higher the degree of tension between a religious group and its surroundings, the more exclusive, profound, and costly the commitment

required. For consumers, the degree of commitment represents cost. Commitment to a highly committed religious group means paying high material, social, and psychological costs. The consumer's reward lies in the higher quality of religious products offered by such groups.

Niebuhr once pointed out that, over time, successful sects tend to reduce their tension with society, thus transforming into large churches. However, this can also lead to schism, as dissatisfied members break away to form new denominations (Niebuhr 1929).

Stark and Finke further use the concept of religious tension to explain long-term church - sect dynamics. They argue that religious movements can be either church movements—where religious groups move toward reducing tension — or sect movements — where religious groups move toward increasing tension. Most religious groups begin with a relatively high tension, with growth concentrated in high-tension groups. However, growth can also lead to a decrease in tension within the group and thus lowers commitment among its members. Similarly, a religious group in a state of declining low tension will shift toward higher tension to obtain greater religious rewards. Both transformations occur simultaneously (Stark & Finke, Chinese translation 2004, pp. 175-206).

Religious groups with varying degrees of tension correspond to the religious needs of different groups. Stark and Finke introduced the concept of “niches”¹ that borrowed from economics, referring to potential believers with shared religious preferences (needs, interests, and expectations). The religious market can be divided into six niches: ultra-liberal, liberal, moderate, conservative, strict, and ultra-strict. Moderate and conservative niches, corresponding to moderate tension, are the largest and have the most potential believers. Each niche is served by specific religious organizations. For example, Unitarian Universalists and Reform Judaism serve ultra-liberal niche, while Amish and Benedictine monks serve ultra-strict niche. As tension between religious groups and the outside world changes, it attracts and serves believers in different niches. During the transition from sect to church, as tension decreases, the religious group leaves its original base niche and attracts larger niches, thus increasing its size. If religious groups in moderate niches continue to lower their tensions, they will drift away from this larger location and cease to grow. If the church abandons its original location, it becomes vulnerable to schism in serving members who prefer high tensions (Stark & Finke, Chinese translation 2004, pp. 237-267).

¹ In a market economy, niche refers to a segment of the market comprised of a specific group of consumers.

2. The Evolution of Church-Sect from the Perspective of Generational Transformation

The tension-based approach to church-sect evolution is characteristic of neoclassical economics. Furthermore, McBride developed a simple dynamic model to explain the long-term evolution from sect to church (McBride 2023, pp. 242-257). This model employs a dynamic perspective of intergenerational evolution, a research approach common in modern economics.

The dynamic model makes the following assumptions: (1) Religious groups have three levels of strictness: low, medium, and high; (2) Members of each generation are replaced by children born into the same religious group in the next period; (3) Each person gains the greatest benefit from the group whose strictness is closest to their ideal strictness; (4) Each child's social class is drawn randomly; (5) the most "elite" members choose the group's strictness; (6) If no religious group matches an individual's ideal strictness, people can establish a new religious group at no cost; (7) The system starts from a starting state called the initial condition. Changing the initial condition will change the dynamical path. Once we start the system, several steps are followed in each time period. Step 1 is that the elites in the group determine the group's strictness. Step 2 is that each individual gives birth to a child and then dies. Each child is born into their parent's religious group. Step 3 is that each child reaches adulthood and makes their affiliation decision. Each individual can stay in their parent's group, switch to another group, or form a new group. Step 4 is that each individual gains member benefits from their affiliation decision. After Step 4 is finished, a new period begins, and the steps repeat.

The dynamic model suggests that additional conditions are required for the classic sect-to-church cyclical pattern. One crucial condition is that individuals must be moderately bound (i.e., a moderate amount of religious capital). If the ties are too weak, dissatisfied members will leave immediately, preventing a sect-to-church transition; if the ties are too strong, then the elites enact the sect-to-church transition, but dissatisfied members never leave to establish a new sect. Other conditions include social mobility, the control of elites and leaders, and barriers to new group formation. If intergenerational social mobility among group members is limited, if social elites cannot control group decisions, or if the cost of forming new groups is too high, then the classic cyclical prediction is unlikely to occur.

Conclusion

In summary, the economics of religion, employing modern economic theory and methods, has achieved significant insight into the origins and evolution of religion. It is evident that, from the perspective of modern

economics, the origins and evolution of religion are inextricably linked to human cooperation and its evolution; as a product of human society, religion itself evolves in ways that adapt to evolving individual and group cooperation. Consequently, the factors influencing religious evolution are extremely complex and diverse.

It must be acknowledged that the economics of religion is still developing and advancing rapidly, and related research is increasingly becoming the frontier of interdisciplinary scholarship; this article offers only a brief and necessarily incomplete overview of existing research on the origin and evolution of religion from a limited perspective.

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