

Why Hasn't Economic Growth Killed Religion?

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PRELIMINARY
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Abstract: Economic growth has not led to a decline in religion despite past predictions that it would. I use a formal model of religious competition to show how economic growth produces counteracting effects on religious participation in an open religious market, while economic growth will have little effect in a religious market that is already secularized due to religious regulations. Theories predicting the decline of religion due to rising opportunity costs of religious demand and supply ignore countervailing influences.

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“[T]he opinion is everywhere gaining ground that religion is a mere survival from a primitive ... age, and its extinction only a matter of time.” A.E. Crawley, 1905

“I think what I and most other sociologists of religion wrote in the 1960s about secularization was a mistake. Our understanding was that secularization and modernity go hand in hand. ... It wasn’t a crazy theory. There was some evidence for it. But I think it’s basically wrong. Most of the world today is certainly not secular. It’s very religious.” P. Berger, 1997¹

1 Introduction

Intellectuals and social scientists have predicted the demise of religion since the early 1700s.² The basic reasoning, termed the secularization hypothesis, is that the economic development, increasing education levels, and higher urbanization associated with modernization lead to a decrease in the demand for religion. This hypothesis, however, has been severely challenged by mounting evidence on religious participation and beliefs in various countries. Evangelical Christianity on the rise in the United States, Islamic fundamentalism spreading in Africa and Asia, and increased religious participation in Eastern Europe after the fall of the USSR all attest to the continued vitality of religion [Iannaccone (1998)]. Despite this evidence, the debate continues [Bruce (1992), Berger (1999)]. Some researchers want the secularization hypothesis to “rest in peace” [Stark (1999)], while others amend secularization theory in light of new evidence [Bruce (2002)].

This paper examines the impact on religion of one aspect of modernization: economic growth. According to Bruce (2002), a secularization theory proponent, “The more pleasant this life, the harder it is to concentrate on the next. The more satisfying being human, the harder to be mindful of God” (25). Economists would phrase the same idea differently: an increase in wages due to economic growth increases the marginal cost of religious participa-

¹The Crawley and Berger quotes are both taken from Stark (1999).

²For example, writing in 1710, Englishman Thomas Woolson (1670-1731) predicted the end of Christianity by 1900, and half a century later Voltaire predicted the end would come within fifty years [Stark (1999)].

tion, thereby leading individuals to switch from religious activities into private activities with higher economic returns [Iannaccone (1998)]. However, this demand side logic ignores other aspects of the religious market that counter this dynamic. For example, economic growth can decrease the cost of supplying religious services thereby increasing religious supply; a denomination, like other organizations, can change formal doctrines and policies, political stances, or behavioral codes to partially accommodate changes in demand [Clark (1956)]; and, as denominations compete for “clientele” in the religious market, market forces may compel them to cater to various segments of the religious market, thus increasing religious pluralism [Finke and Stark (1992)]. Understanding the impact of economic growth on religion thus requires an examination of the various ways it affects both the demand and supply sides of the religious market.

To capture various features of the religious market, this paper presents a game theoretic study of religious competition that focuses on a denomination’s degree of “tension” with its surrounding environment as its key characteristic [Johnson (1963), Iannaccone (1994)]. Low tension denominations require little from their adherents, while high tension denominations have strict requirements. Similar to Barros and Garoupa (2002), Montgomery (2003), and McBride (2005), I model religious competition as a Hotelling location game in which individuals’ ideal strictness levels are distributed on the unit interval. After denominations locate on the unit interval by choosing strictness levels, each individual chooses to affiliate with whichever denomination is closest to her ideal strictness. A religious equilibrium is a profile of denomination strictness levels and membership sizes in which no religious consumer or producer has an incentive to change behavior.

The effects of economic growth on religion are captured by examining the “comparative statics” of the equilibria as parameters change in various ways. I find that economic growth can produce counteracting influences on religious pluralism and participation in an open religious market. As predicted by secularization thinkers, an increase in the return to secular activities (e.g., higher wages) shifts religious demand to favor less strict religions. However, denominations adjust their strictness levels to maintain affiliation rates. Moreover, an increase in wage inequality can increase religious pluralism—even if the average wage

increases—because there may be a larger number of individuals demanding high strictness. On the supply side, if economic growth increases the suppliers' opportunity cost of providing religious goods, then there will be a decline in pluralism as denominations exit, yet if economic growth also improves the technology of providing religious benefits, then religious pluralism increases. Thus, whether economic growth reduces religious participation or pluralism in an open religious market will depend on the overall aggregation of many factors, and religious demise is not an automatic prediction.

The religious market structure also matters, as claimed by religious economies proponents. A monopoly denomination's only competition arises from individuals' option to not affiliate, and it will lower its strictness to cater to those individuals considering non-affiliation. The result is a secularized monopoly religion. Economic growth does not affect the nature of this competition, and so it has no impact on the monopoly's behavior. Thus, the future of religion in open and regulated religious markets can be very different. Regulated markets will remain much more secularized, while open markets may retain high levels of religious pluralism. Overall, these results exhibit elements of both secularization theory and religious economies theory, i.e., the impact of economic growth on religion depends on the changes in both demand—as argued by the former—and supply—as argued by the latter.

These findings complement a growing literature in economics and other social sciences on the theory of religion.³ The economics literature dates to Adam Smith who first postulated that clergy act in their self-interest, that market competition constrains denominations, and that religious market regulations affect the quality of religious services [Anderson (1988)]. Modern treatments in economics can be grouped into three broad categories: research on individual or household religious behavior, research on religious groups, and research on religious economies [Iannaccone (1997, 1998)]. Azzi and Ehrenberg (1975) present the first rational choice model of religious behavior wherein an individual's choice to attend church is an investment in after-life consumption. Subsequent empirical work provides mixed support for their conclusions, although the evidence does indicate that the opportunity cost

³The “economics of religion” literature is to be distinguished from the “religious economics” literature [Kuran (1994)]. Iannaccone (1998) reviews many key issues in the economics of religion literature.

of time impacts religious participation [Iannaccone (1998)]. Iannaccone (1990) extends this basic model to include “religious capital,” whereby religious participation today increases the benefits of future participation. These experience effects help explain the influence of religious upbringing and the prevalence of intra-faith marriages.

The study of religious groups looks more closely at how denominations provide religious benefits. Iannaccone (1988, 1992) considers a religious group as a club, and shows how high membership costs (strictness) act to screen out low-participation members and reduce the monitoring costs of identifying religious free-riders. Individuals with fewer secular opportunities will join strict denominations (sects) to obtain larger religious benefits, while those with better opportunities will join less demanding denominations (churches). Montgomery (1996) examines religious group “sect-to-church” dynamics to show how a religious group’s strictness changes over time as the younger generation, raised in the denomination but not in favor of its strictness, exert influence to make the group more mainstream. Ekelund, Herbert, and Tollison (1989, 2004) depict the medieval Catholic Church as a monopoly firm (instead of a club) to explain its various actions.

My paper belongs in the third category. It is most closely related to three papers that model religious competition as a Hotelling location game. Barros and Garoupa (2002) examine religious competition in monopoly and duopoly religious markets, while Montgomery (2003) and McBride (2005) examine the relationship between religious pluralism and religious participation. My paper differs by addressing the question of how economic growth affects religious competition. There is also a growing empirical literature on religious markets [e.g., Barro and McCleary (2002, 2003a, 2003b), Gruber (2005)] to some of which I relate my findings in the conclusion.

The relevant non-economics literature is much larger.⁴ Proponents of secularization thinking have presented several mechanisms by which secularization occurs. Tschannen (1991) and Swatos and Christiano (1999) provide overviews of the secularization paradigm, and Bruce (2002) provides a recent comprehensive treatment. Secularization critics empha-

⁴For a broad treatment of each side of the secularization debate, simultaneously read pro-secularization Bruce (2002) and anti-secularization Stark and Finke (2000).

size the importance of the supply side of religious markets in explaining trends in religious participation. Low religious participation in western Europe, long seen as evidence in support of the secularization hypothesis, is thought to be due to regulations that deter religious entry rather than to shifting religious demand, and high religious participation in America is due to its open religious economy and vibrant religious entrepreneurs [Warner (1993), Stark and Iannaccone (1994), Finke (1997)]. Their supply side argument represents a paradigm shift in thinking about religion, and it draws language and ideas from rational choice economic thinking in making its arguments [Young (1997)]. Stark and Finke (2000) present a comprehensive treatment of this approach. My model has close ties to the supply side paradigm because it captures the role of supply side regulations on religious competition. However, it also complements the work of proponents of secularization theory by examining how changes in religious demand due to economic growth can affect religious outcomes. In this manner, my model provides a theoretical framework which can capture elements of both sides of the debate.

2 Model

Sociologists since as early as Johnson (1963) have characterized denominations by the level of “tension” they maintain with their local secular society. Some denominations, called sects, exist in a state of tension with the existing society because of their rejection of prevailing moral codes, while other denominations, called churches, exist with little tension because they accept the prevailing moral codes. Iannaccone (1994) uses a uni-dimensional measure of denominational “strictness” to capture tension since high tension denominations impose stricter behavioral standards on their members.⁵ For example, he ranks denominations in the United States as follows: Episcopal, Methodist, Presbyterian, and the United Church of

⁵See Chapter 6 of Stark and Finke (2000) for a discussion of another use of the terms “church” and “sect.” In short, a church is usually thought of as a conventional religious organization that accepts the existing social order and does not impose demands far beyond society’s moral code. A sect, on the other hand, demands a “higher” order of living. The church-low tension, sect-high tension connections follow. A sect can be further distinguished from a “cult.” A sect is rooted in the dominant religious tradition of the society, while a cult is a novel or alien religion. Because I use a uni-dimensional measure for tension or strictness, I do not distinguish between sect and cult. See Dawson (2003) for a discussion of cults.

Christ are low strictness, liberal mainline denominations; Evangelical, Lutheran, Reformed Church, Disciples of Christ are medium-low strictness, moderate mainline denominations; Missouri Synod Lutheran and Southern Baptist are conservative, medium-high strictness denominations; and Nazarene, Assemblies of God, Seventh Day Adventist, and Mormon are high-tension denominations.

The following model equates tension with strictness. Consider a continuum of utility maximizing individuals that differ only in their preferred strictness levels. In particular, if i chooses to affiliate with denomination d , then her payoff is

$$u_i = -|s_i - s_d|, \quad (1)$$

where $s_i \in [0, 1]$ is her most preferred strictness level and $s_d \in [0, 1]$ is denomination d 's strictness level. Individual i can also choose to not affiliate with any denomination, in which case she receives payoff $-s_i$ (non-affiliation equals choosing strictness 0). If i is indifferent between two denominations (or between affiliation and non-affiliation) then she chooses to affiliate with each denomination (or non-affiliation) with equal probability. Ideal strictnesses are distributed according to c.d.f. $F(s)$.

Let $D = \{1, 2, \dots\}$ be the set of potential denominations. Each potential denomination d , if it chooses to enter the religious market, chooses strictness level s_d to maximize its payoff function

$$\pi_d(s_d, s_{-d}) = Am_d(s_d, s_{-d}) - c, \quad (2)$$

where m_d is the final share of the population that are members of denomination d , $A > 0$ is a religious technology parameter, and $c > 0$ is the fixed cost of providing religious services. The technology parameter A captures various elements of religious supply, e.g., the ability of the denomination to extract benefits from its members. If the denomination does not enter, it expends its efforts in a secular industry and earns profits $\bar{\pi}$, so that $\bar{\pi}$ is d 's opportunity cost of providing religious services.

Decisions are made in the following order.

1. Potential denominations simultaneously choose to either locate at a strictness level or

postpone the decision to period 2. Once a potential denomination locates, it cannot change its strictness or exit.

2. Any potential denomination that did not locate in period 2 now chooses to locate or never locate (exit). Assume that it exits if indifferent between entering and not entering.
3. After observing the located denominations' strictness levels, individuals simultaneously choose denominational affiliations.
4. Located denominations and individuals receive their payoffs, and non-located potential denominations receive payoff $\bar{\pi}$.

The representation of consumers' religious preferences in (1) greatly simplifies the affiliation decision. It abstracts from the socialization of children in their parents' religion, conversion experiences, and other qualitative features of religious goods that make them different from normal secular goods.⁶ It is, however, based on the following model of utility maximization used by Iannaccone (1988, 1994) and Montgomery (1996).

Let each individual i have utility function

$$u_i = u(w_i, s_d) = Z(w_i, s_d) + R(s_d), \quad (3)$$

where Z is the "secular" payoff, R is the "religious" payoff, $w_i > 0$ is i 's wage rate, and $s_d \in [0, 1]$ is the level of religious strictness i must "pay" to affiliate with denomination d . Let $Z_w > 0$, $Z_s < 0$, $Z_{ws} < 0$, $R_s > 0$. The Z derivatives capture the ideas that stricter denominations impose restrictions on secular activities, and that the marginal effects of these increase in the wage rate (those with higher wages lose more secular payoffs). The R derivative captures the notion that a stricter denomination must offer larger religious benefits to affiliated individuals who abide the higher strictness [Iannaccone (1992)].

Individuals differ only in their wage rates, which are distributed according to distribution function $F(w)$. Utility maximization implies that, given her wage w_i , an individual

⁶For example, some religious goods are promises concerning the next life, which are not directly consumed in this life and which are not falsifiable.

will choose a denomination that best equates her marginal rates of substitution across secular and religious benefits. Note that s_d^* (in the interior of $(0, 1)$) maximizes i 's utility if $R_s(s_d^*) = Z_s(w_i, s_d^*)$. By the envelope theorem, we obtain $s_d^*(w_i)$, i 's uniquely most preferred strictness, such that $s_d^*(w_i)$ is monotonically decreasing in w_i , i.e., a higher wage increases the opportunity cost of strictness, thereby lowering the ideal strictness. Because strictness levels run on a continuum, it will generally be true for most i that no denomination will have strictness $s_d^*(w_i)$. With continuous and differentiable R and Z functions, i would prefer s_d over $s_{d'}$ if $s_d^*(w_i) < s_d < s_{d'}$. When $s_d < s_d^*(w_i) < s_{d'}$, then there will be some $s' \in (s_d, s_{d'})$ such that if $s_d^*(w_i) = s'$ then i will be indifferent between s_d and $s_{d'}$. Under appropriate conditions on Z and R , we obtain the preferences depicted in (1). However, the key is that we can tie the distribution of ideal preferences directly to the distribution of wages. I return to this fact when discussing the impact of economic growth on religious preferences.

The depiction of denominations' preferences in (2) abstracts from actual denomination leaders' motivations and differs from other representations of denomination preferences and religious production technology. For example, Barros and Garoupa's (2002)⁷ assume each denomination maximizes the utility of its membership, Iannoccone (1992) describes how the public good nature of religious services, whereby the services a denomination provides may depend on its membership size, and Ekelund, Hebert, and Tollison (1989) examine the medieval Church as a rent-seeking institution. Although these can be added to my model, my simplified preferences capture the notion that, all else equal, denomination leaders prefer to have larger memberships. This assumption is not without merit since denominations that do not care about membership size are likely to not survive in the long run.

Altogether, this is a Hotelling location model with two unique features: the presence of a firm with location fixed at 0, and a two stage representation of firm entry. The first feature captures various elements related to non-affiliation. If religious benefits derive only from

⁷My model was developed independently of Barros and Garoupa (2002) and originally used a different denomination production function. It assumed $\pi_d = Am_d - s_d$, which captures the notion that a denomination must offer larger benefits to its membership if it requires higher strictness from them, and these larger benefits are only possible at an increased cost. The main implication of this different production function is that equilibrium denomination sizes will differ according to strictness, whereas with fixed cost c equilibrium denomination sizes are roughly equal.

membership in a denomination, then not affiliating yields no religious benefits. Since there is a cost to strictness ($Z_s < 0$), an individual who does not affiliate will choose strictness 0.

The second feature, two-stage denomination entry, captures the idea that denominations currently in the market must be concerned not just about competition from located denominations but also from future potential entrants. In technical terms, actors in an equilibrium should consider not just their own deviations holding others' entry decisions fixed, but should also consider entry that might result from their own deviations. A standard static non-cooperative concept (e.g., Nash equilibrium) would not consider such dual deviations if there is only one period of entry. The two-stage entry captures dual deviations in a standard equilibrium concept since a denomination that locates early must be concerned about entry in stage 2.

3 Equilibria with Uniform $F(s)$

As will be discussed in greater detail below, there will generally be multiple equilibria of this religious market game. I focus on a particular class of subgame perfect equilibria (SPE) in which D^* potential denominations locate in period 1, the remaining potential denominations exit in period 2, and all individuals affiliate with the denomination whose strictness is closest on the unit interval (with non-affiliation still an option at strictness 0).⁸ This equilibrium, which I denote as a D^* -SPE, has a pertinent interpretation. A D^* -SPE can be considered as the long-run steady state of a religious market in which denominations can adjust their strictness levels over time in response to other denominations' strictness levels, and “incumbent” denominations face the threat of religious entry.

To illustrate the essential strategic elements of the game, I restrict attention in this section to the special case of a uniform distribution of ideal strictnesses, $F(s) = s$. Let us now construct a simple D^* -SPE.

⁸If located denominations receive payoffs higher than the reservation opportunity $\bar{\pi}$, then there will likely be competition in the first period to see who gets to enter. Thus, there can exist equilibria in which mixed entry strategies are played in period 1. I do not examine SPE with such mixed strategies. The primary reason is that a pure equilibrium corresponds better to a long-run equilibrium with long-lived denominations.

Let

$$\begin{aligned}
\tilde{s}_1 &= 1 - \frac{c + \bar{\pi}}{A} \\
\tilde{s}_2 &= 1 - 3 \frac{c + \bar{\pi}}{A} \\
\tilde{s}_3 &= 1 - 5 \frac{c + \bar{\pi}}{A} \\
&\dots \\
\tilde{s}_d &= 1 - (2d - 1) \frac{c + \bar{\pi}}{A}.
\end{aligned}$$

If $\tilde{s}_d > \varepsilon$, with $\varepsilon > 0$ small, then have d locate at \tilde{s}_d in period 1. Otherwise, if $\tilde{s}_d \leq 0$, then have d not locate in period 1 and exit in period 2. As constructed, we have a profile with denominations spread across the unit interval.

Figure 1(a) depicts this profile if $A = 6$ and $c + \bar{\pi} = 1$. We have $\tilde{s}_1 = \frac{5}{6}$, $\tilde{s}_2 = \frac{3}{6}$, $\tilde{s}_3 = \frac{1}{6}$ and, since, $\tilde{s}_d \leq 0$ for all $d > 3$, any such d exits in stage 2. Given these locations for denominations 1, 2, and 3, any individual to the right of s_1 will affiliate with denomination 1. Individuals between s_1 and s_2 will affiliate with either denomination 1 or 2 depending on which is closer. Individuals to the left of s_2 but closer to 0 will not affiliate, while those closer to s_2 will affiliate with denomination 2. The resulting membership sizes are $m_1 = \frac{2}{6}$, $m_2 = \frac{2}{6}$, $m_3 = \frac{1.5}{6}$, and $\frac{0.5}{6}$ not affiliating.

It is straightforward to show that this profile is an equilibrium. First, consider the payoff to a denomination d that did not enter in period 1 but considers entering in period 2. It will not enter unless $Am_d - c > \bar{\pi} \Rightarrow m_d > \frac{c + \bar{\pi}}{A}$, where m_d is the size of membership it will get if it enters and holding fixed all other denominations' actions. Given the current profile of denomination locations, d cannot get a membership that large. Its best location to 1's right is at $s_1 + \varepsilon$, but this yields $m_d = \frac{c + \bar{\pi}}{A} - \frac{1}{2}\varepsilon < \frac{c + \bar{\pi}}{A}$: it gets the $\frac{c + \bar{\pi}}{A} - \varepsilon$ members to the right of its location but only $\frac{1}{2}\varepsilon$ members to its left. If d locates between 1 and 2, between 2 and 3, or exactly at s_1 or s_2 , it will get membership equal to $\frac{c + \bar{\pi}}{A}$. If it locates between 3 and 0 or exactly at 3, it will get membership less than $\frac{c + \bar{\pi}}{A}$. Since d can do no better than its exit payoff $\frac{c + \bar{\pi}}{A}$, exiting is a best response for d in period 2.

Now consider whether a located denomination wants to move its location. Although

1 can potentially increase its denomination size by deviating slightly to its left, doing so will leave room for entry on its right by a firm in period 2, so 1 will not want to shift left. It will not want to shift right either since if it does, it decreases its membership size and creates room for an entrant to enter between 1 and 2. By similar logic, no other located denomination can improve by deviating to the opposite side of another denomination.

This is not the only D^* -SPE. Figure 1(b) depicts an equilibrium in which $s_1 = \frac{5}{6}$ as before, but where s_2 and s_3 have both shifted rightward to $s_2 = \frac{4}{6}$ and $s_3 = \frac{2}{6}$. In fact, there are an infinite number of equilibria with $D^* = 3$. Any profile with $s_1 = \frac{5}{6}$, $s_2 \in [\frac{3}{6}, \frac{4}{6}]$, and $s_3 = s_2 - \frac{2}{6}$ will be an equilibrium. These are obtained by sliding s_2 and s_3 to the right when starting from the equilibrium in Figure 1(a). There is also another continuum of equilibria: any profile with $s_1 = \frac{5}{6}$, $s_2 = \frac{3}{6}$, and $s_3 \in [\frac{1}{6}, \frac{2}{6}]$ is also an equilibrium. There can also exist equilibria with $D^* = 4$, such as the one depicted in Figure 1(c). Again, there is a continuum of $D^* = 4$ equilibria, each obtained by sliding all denominations but s_1 .

Although there are many equilibria, these equilibria all share a few key features.

Proposition 1: *Suppose a uniform distribution of ideal strictnesses $F(s)$. A D^* -SPE with $D^* > 1$ must have the following features.*

- (a) *Any located denomination d must have $m_d \geq \frac{c+\bar{\pi}}{A}$.*
- (b) *The least strict denomination $d = D^*$ must be located at $s_{D^*} \leq 2\left(\frac{c+\bar{\pi}}{A}\right)$.*
- (c) *$s_d - s_{d+1} \leq 2\left(\frac{c+\bar{\pi}}{A}\right)$.*
- (d) *The strictest denomination $d = 1$ must be located at $s_1 = 1 - \frac{c+\bar{\pi}}{A}$.*

If (a) did not hold, then a located denomination would be better off exiting than remaining in the market. If (b) did not hold, then entry will occur between 0 and s_{D^*} . If (c) did not hold then entry would occur between s_{d+1} and s_d . For (d), note that denomination 1 increases her membership by shifting towards s_2 if no entry occurs in period 2 after her deviation. However, if $s_1 < 1 - \frac{c+\bar{\pi}}{A}$, there will be entry to 1's right. Thus, $1 - \frac{c+\bar{\pi}}{A}$ is the farthest left she can be and still prevent entry on her right. Because she has that incentive to shift left, she will locate at $1 - \frac{c+\bar{\pi}}{A}$.

Part (a) implies that a D^* -SPE must have sufficiently few denominations that any located denomination receives enough membership to remain in the market, while (b) and (c) imply that there must be sufficiently many denominations to prevent the existence of niches that would lead to entry. Thus, for any given A , c , and $\bar{\pi}$, there will usually exist a compact range of positive integer D^* 's, such that there is a D^* -SPE with $D^* \in \{D_L^*, D_L^* + 1, \dots, D_H^*\}$. Note as well that if A increases or if c or $\bar{\pi}$ decreases, all else constant, then this range will shift to the right. That is, both D_L^* and D_H^* will increase if A increases or if c or $\bar{\pi}$ decreases.

These equilibria demonstrate how religious competition determines the distribution of denomination types and membership sizes. The incentive to obtain membership drives denominations to specialize by choosing unique strictness levels in order to obtain market niches, but in equilibrium, they will also be not so far from other denominations that there is room for religious entry. Thus, the underlying parameters of the model place restrictions on both the distribution of denomination types and on the sizes of those denominations. Some denominations will maintain large tension with the surrounding environment, while others will not demand much from their members. Summarizing:

Proposition 2: *Fix A , c , and $\bar{\pi}$, and suppose uniform $F(s)$.*

- (a) *There always exists a D^* -SPE with $D^* \geq 0$.*
- (b) *D_L^* and D_H^* will both increase as A increases, c decreases, or $\bar{\pi}$ decreases.*
- (c) *Average denomination sizes decrease (generically) as A increases, c decreases, or $\bar{\pi}$ decreases.*

4 Growth in an Open Religious Market

To examine how economic growth affects religious vitality, we need measures of vitality. I consider two concepts that have received much attention in the literature: religious pluralism and religious participation.⁹ Since equilibrium denomination sizes are roughly equal, and since they are spread across the strictness spectrum, one simple measure of religious pluralism

⁹For recent formal examinations of these two concepts, see Montgomery (2003) and McBride (2005). Chaves and Gorski (2001) survey the earlier empirical work.

is the number of equilibrium denominations so that one equilibrium is more pluralistic than another if it has more denominations. We may also suppose that pluralism should reflect the underlying religious behavior and not just denominational affiliations so that pluralism should be tied to religious strictness. Essentially, one equilibrium is more pluralistic than another if it exhibits a wider range of observed strictness. As long as the non-affiliation option exists, this range will generally be $[0, s_1]$.¹⁰

I consider two measures of religious participation. The first is the percent of the population affiliated with a denomination so that one equilibrium has more participation than another if it has a smaller percent of non-affiliated individuals. However, affiliation does not necessarily capture religious behavior if behavior is tied to religious strictness. For example, less strict denominations tend to impose fewer behavioral requirements—such as attendance at church meetings—on their members than stricter denominations [Iannaccone (1994)], so that a $D^* = 1$ equilibrium with a low strictness denomination may exhibit less religious participation than a $D^* = 1$ equilibrium with a stricter denomination. Thus, insofar as participation is tied to strictness, the range of observed strictness $[0, s_1]$ is a better indication of religious participation. It turns out that these distinctions will matter.

4.1 Growth and Religious Supply

It will be easiest to first examine the effects of economic growth on the supply side of the religious market. Consider now the effect of increased secular opportunities on religious suppliers. As secular opportunities increase, the opportunity cost $\bar{\pi}$ of producing religious benefits also increases. This will decrease the number of denominations and increase the size of denominations (Proposition 2), and the strictest denomination will become less strict (Proposition 1). Thus, according to both pluralism measures, we will observe a decrease in religious pluralism.

Religious participation is also likely to drop according to each measure. Since the least strict denomination D^* must be no farther than $2\frac{c+\bar{\pi}}{A}$ from strictness 0, an increase in $\bar{\pi}$ can

¹⁰Many of the empirical studies of the relationship between pluralism and participation use a Herfindahl index to measure pluralism, however this measure is problematic [Voas, Olson, and Crockett (2002)].

result in the D^* being more strict. This, in turn, leads to an increase in the non-affiliated population. This might sound contradictory since the most strict denomination is becoming less strict, but it is clearly possible if the number of denominations decreases. If we consider the strictness measure of participation, then the shrinking of the range $[0, s_1]$ signifies a drop in participation.

While both pluralism and participation will decrease as economic growth increases the opportunity cost of religious production, it also possible that economic growth increases the religious technology A or decreases the cost of religious production c . For example, denominations may discover cheaper direct costs of religious advertising, better capabilities of monitoring denomination members or leaders, more effective abilities to extract resources from affiliated members, and so on. Since an increase in A or a decrease in c has the opposite effect as an increase in $\bar{\pi}$, such positive supply shocks will offset the effect of the increased opportunity costs on both pluralism and participation. Which effect dominates is a topic I return to later, but for now Proposition 3 summarizes the results relating growth and religious supply.

Proposition 3: *Through the supply side of the religious market, economic growth can increase or decrease religious pluralism and participation in a D^* -SPE. Specifically,*

- (a) *Increases in the opportunity cost $\bar{\pi}$ of providing religion will decrease religious pluralism and religious participation.*
- (b) *Increases in the religious technology A or decreases in the religious production costs c will increase religious pluralism and participation.*

4.2 Growth and Religious Demand

Considering the impact of economic growth on religious demand means considering how it affects the distribution of ideal strictnesses $F(s)$, which in turn requires moving away from the uniform $F(s)$ assumption. To narrow my focus, I restrict my analysis to bell-shaped (i.e., single-peaked) distributions for which the bell (peak) occurs at some s in the interior

of the unit interval. Stark and Finke (2000) suggest that such a distribution approximates actual religious preferences.

Figures 2(a)-(c) depict three bell-shaped distributions. Figure 2(a) has a p.d.f. that is symmetric about $s = \frac{1}{2}$. Figure 2(b) has a lower mean than 2(a), i.e., (b) is first-order stochastically dominated by (a). Figure 2(c) depicts a mean-preserving spread of (a), i.e., (c) is second-order stochastically dominated by (a). Figure 2(d) illustrates the limiting case of the uniform distribution for comparison.

Analysis with a bell-shaped distribution differs slightly from the analysis with the uniform distribution. With generic $F(s)$, the strictest denomination must still locate as far left as possible without allowing entry on its right, but we must now consider the shape of the distribution. We can calculate s_1 to be the location for 1 that makes the a potential entrant exactly equal between entering and not entering:

$$\begin{aligned} A(1 - F(s_1)) - c &= \bar{\pi} \\ s_1 &= F^{-1}\left(1 - \frac{c + \bar{\pi}}{A}\right). \end{aligned}$$

This is depicted in Figure 2(a). The uniform case which has $s_1 = 1 - \frac{c + \bar{\pi}}{A}$ is clearly just a special case.

Things are not as simple for the other denominations. Consider the least strict denomination D^* . In the uniform case, entry yields membership size $\frac{s_{D^*}^*}{2}$ for entry by a denomination in period 2 at any location on D^* 's left, but in the general $F(s)$ case, the entrant's membership size will depend on where it enters on D^* 's left. If the p.d.f. is increasing over $(0, s_{D^*}^*)$ —which is the case if $s_{D^*}^*$ is to the left of the peak—then potential entrant d will get larger membership by choosing as high a strictness as possible in that interval, essentially $s_d = s_{D^*}^* - \varepsilon$. In this case, $s_{D^*}^*$ must be located such that

$$\begin{aligned} A\left(F(s_{D^*}^*) - F\left(\frac{s_{D^*}^*}{2}\right)\right) - c &= \bar{\pi} \\ F(s_{D^*}^*) - F\left(\frac{s_{D^*}^*}{2}\right) &= \frac{c + \bar{\pi}}{A}. \end{aligned}$$

If $s_{D^*}^*$ is to right of the peak then d might not enter at $s_{D^*}^* - \varepsilon$ but might instead locate closer to the peak to get a larger membership. More generally, to find the highest strictness

that D^* can be, find the largest $s_{D^*}^*$ such that

$$A \left(F \left(\frac{s_d + s_{D^*}^*}{2} \right) - F \left(\frac{s_d}{2} \right) \right) - c \leq \bar{\pi} \text{ for all } 0 < s_d < s_{D^*}^*.$$

We can focus on these two boundary denominations—the most strict and least strict—when examining the effects of economic growth on religious demand. As mentioned earlier, economic growth that increases average wages will increase the return to secular activities, thereby increasing the opportunity cost of religious activity. With equation (3) as a motivation for the representation of preferences in (1), this can be manifest as a shift in the distribution from $F(s)$ to $F'(s)$ such that $F'(s)$ is first-order stochastically dominated by $F(s)$, i.e., $F'(s) \geq F(s)$ for all s . This constitutes a shift in the entire distribution and implies that the mean ideal strictness is now lower under $F'(s)$, akin to a shift from Figure 2(a) to 2(b).

Denominations will respond to this shift in preferences by locating at lower strictnesses. Recall that $s_1 = F^{-1}(1 - \frac{c}{A})$. Because a shift in $F(s)$ to $F'(s)$ will result in a drop in $F^{-1}(1 - \frac{c}{A})$, denomination 1 will be less strict than before. This leftward shifts will be similar for all located denomination, including the least strict denomination D^* . Because denomination strictnesses adapt to the shifting preferences, denomination membership sizes might not change very much if at all, and pluralism as measured by the number of denominations would not change. As measured by the range of religious behavior, however, there will be a decrease in pluralism as s_1 decreases.

Whether or not non-affiliation increases will depend on the way the c.d.f. shifts at low strictness levels. Although more individuals prefer low strictness levels, D^* 's strictness will also decrease. If religious participation decreases as non-affiliation increases, then the effect of increased secular opportunities on religious participation is unclear since we do not know if non-affiliation changes. However, if participation is tied more directly to strictness, then there will likely be a decrease in religious participation as denominations choose lower strictness levels. Summarizing, increased returns to secular activities will decrease pluralism and participation if their measures are tied to strictness, but they may have little effect on pluralism in the sense of the number of denominations or on participation in the form of

affiliation.

Economic growth may also cause other changes in the distribution of ideal strictnesses. Suppose economic growth is uneven so that there is increased inequality in the return to secular activities (e.g., increased wage inequality). With (3) as motivation, the result is an increase in the variance of ideal strictnesses. As before, the shift in demand does not affect the number of denominations or affiliation rates, but it will affect observed strictness.

This can be demonstrated using the concept of second-order stochastic dominance. If $F(s)$ and $F'(s)$ have the same mean and $\int_0^s F(s) ds \geq \int_0^s F'(s) ds$ for all s , then we say that $F'(s)$ is a mean-preserving spread of $F(s)$, i.e., $F'(s)$ is second-order stochastically dominated by $F(s)$. This is akin to a shift from Figure 2(a) to 2(c). Wider variance implies that $f'(s)$ has fatter tails than $f(s)$. If s_1^* was in the right tail of $f(s)$, but the tail is now fatter, then $s_1'^* > s_1^*$. On the left side, if $s_{D^*}^*$ was in the left tail of $f(s)$ but that tail is now fatter, then $s_{D^*}'^* < s_{D^*}^*$. Thus, if denominations span a sufficient area of the unit interval, then increased inequality will increase the range of observed strictnesses. Thus, we may observe an increase in observed pluralism and participation.

Altogether, economic growth that increases the returns to secular activities will decrease or have little effect on pluralism and participation, but the impact might be offset if there is a coincidental increase in inequality of those returns. Just like the effects of economic growth on religion through the supply side, the effects on religion through the demand side are ambiguous *a priori*.

Proposition 4: (Growth—demand side) *Through the demand side of the religious market, economic growth can increase or decrease religious pluralism and participation in a D*-SPE. Specifically,*

- (a) *Increases in the return to secular activities will have little or no effect on the number of denominations and affiliation rates, but it will decrease pluralism and participation tied to strictness.*
- (b) *Increases in inequality of the returns to secular activity (if denominations span the strictness domain) will have little or no effect on the number of denom-*

inations and affiliation rates, but it will increase pluralism and participation tied to strictness.

4.3 Discussion

Economic growth potentially affects both the demand and supply sides of an open religious market, and it can do so in a manner that produces countervailing influences. Thus, it is not economic growth *per se* that will be “the end of religion,” but the nature of that growth that determines religion’s future. Theories that link economic growth only to diminished demand for religious activities may therefore incorrectly predict the demise of religion if they ignore both opposing demand side forces and adaptation by religious suppliers.

That is not to say that religious demise is impossible. The model does not predict the demise or the triumph of religion, nor does it predict that demise or triumph is impossible. Each is possible depending on how economic growth occurs. If rising opportunity costs to religious suppliers and demanders overpower other effects of growth, then religious pluralism and participation will decline as predicted by the secularization paradigm. If the other effects keep pace, then religion will survive.

Which effects will dominate? While this is ultimately an empirical question beyond the scope of this paper, I mention here two issues of direct relevance. The first relates to adaptation and innovation by religious suppliers. The very definition of economic growth suggests that producers’ secular opportunities $\bar{\pi}$ will increase. Moreover, the Baumol Effect, which states that productivity growth is likely to be slower in labor-intensive industries such as religion, suggests that $\bar{\pi}$ would increase faster than c decreases and A increases [Baumol (1967)]. While this suggests eventual religious demise (all else constant), another feature of the Baumol Effect may work to offset this trend. If religious producers’ skills are tied to labor-intensive industries, then their outside opportunities will not rise as quickly as outside opportunities for secular good producers with skills in capital-intensive industries. Thus, $\bar{\pi}$ might not increase very rapidly for religious producers, and changes in c and A may keep pace or even outpace the increase in $\bar{\pi}$.

Some anecdotal evidence indicates that suppliers are adapting to meet changing religious

demand. For example, some religious groups are attempting to adapt twenty-first century technology to suit their uses. Consider the following from *The Christian Century* (2002):

Technology has found religion; or perhaps it's the other way around, according to the New York Times (May 16). Churches are going beyond the typical digital sound systems, PowerPoint sermon outlines and the use of video clips to illustrate sermon points. Take "The Rock," an interdenominational church in Roseville, California. "The church has a 330-seat sanctuary with a big-screen television and integrated keypads built into seat armrests. The buttons on the keypads allow members of the congregation to answer multiple-choice questions asked by the pastor during the service. The answers, which often touch on delicate issues like emotional abuse or spending habits, are quickly compiled into percentages. ... The pastor takes the responses and adjusts his sermon on the spot, recounting stories about life experiences that address the congregation's concerns" (9).

In fact, some secularists fear that religionists are too successful in adapting new technologies into religious production. An article in *Free Inquiry* [Porteous (1994)], a secular humanist publication, warns its readers of how the religious right uses technology to make the political aspect of its religious production more efficient. Nonetheless, religious producers such as Bonnot, Boomershire, and Sweeney (2001)—a priest, a minister, and a producer of spirituality-enhancing media products—argue that more supply side adaptations are required to keep pace with changing demand.

The second issue relates to how easy it is to substitute away from religious consumption. With diminishing marginal utility to secular consumption, each unit increase in wage will lead to successively smaller decreases in ideal strictnesses, thereby implying that religious demand might not shift as quickly as secularization theorists suggest. Also, certain religious benefits do not have effective secular substitutes. For example, while a denomination provides benefits consumable in the present such as friendships and social support, Stark and Finke (2000) emphasize that religion also provides promises of other worldly rewards. Since other worldly rewards are not consumed in the present, it is the promise of other worldly rewards

that is valued, and these promises are tied to religious doctrine and behavior. If these promises do not have adequate secular substitutes, then rising income levels will not lead individuals to completely substitute away from religious consumption.

Overall, the successful adaptation of religious producers and the uniqueness of religious goods will determine whether economic growth will cause religious decline. Given that religion has strived in some countries that have experienced a century of economic growth, such as the U.S.A., the future of religion may instead involve more of the same. Religious suppliers will continue to adapt, and religion will not decline.

5 Regulated Religious Markets

Secularization thinking survives because its proponents point to highly secularized western Europe for empirical verification. Low religious participation is found in mono-Catholic Belgium and France, mono-Protestant England, Wales, Scandinavia, and Iceland, and multi-denominational Germany, Switzerland, and the Netherlands [Barros and Garoupa (2002)]. While proponents of secularization thinking refer to these countries as examples in support of their case, supply-side thinkers argue that secularized Western Europe is due more to religious market regulations than to secularized religious preferences [Finke (1997)].

Religious markets in the past and today are regulated in primarily two ways: suppression and subsidy. Suppression includes actual laws or other state-sponsored activities that forbid or inhibit the formation of new denominations or the activities of their members. Consider some examples from current-day Germany: Scientologists have been excluded from government employment; entry visas have been refused to prominent non-German Scientologists; some public officials have suggested putting Jehovah's Witnesses under secret service watch; new denominations are routinely hindered from getting proper licenses or building permits; and many Pentecostal groups cannot get tax-free status unless they register as secular groups instead of churches [Stark and Finke (2000)]. Subsidies include the provision of state resources for church operations, such as the payment of church employees' salaries. The Church of Sweden, for example, runs on taxes paid for by all Swedes (even those not

affiliated with the Church of Sweden), the Swedish clergy have civil service job security, and other denominations do not receive the same support [Stark and Finke (2000)].

Regulation has the potential to impact religious competition in a variety of ways. It can raise the cost of entry to new denominations, thus leading to larger incumbent monopoly or duopoly denominations. Adam Smith commented years ago that it can also alter the incentives of religious providers, e.g., a protected incumbent who does not need to compete against other denominations for religious clientele will be less likely to provide high quality religious benefits. Finally, an incumbent may be more concerned about the political economy or public choice of maintaining the advantaged market position than with adapting to changes in consumers' religious demand.

To examine the impact of economic growth in a regulated setting, consider the extreme case of a regulated monopoly setting. Assume that regulations are sufficiently permanent so that there is no threat of entry, and that the monopoly needs only focus on amassing membership instead of trying to maintain its monopoly position.

In this setting, a monopoly M that locates at s_M will receive payoff $A(1 - F(\frac{s_M}{2})) - c$. All individuals to the right of s_M will always affiliate with the monopoly, while only those between $\frac{s_M}{2}$ and s_M on its left will affiliate. Notice that this payoff increases as s_M approaches strictness 0, since lowering its strictness increases its membership. In effect, the monopoly's only competition comes from individuals' non-affiliation option, so by lowering its strictness it can entice individuals to switch from non-affiliation to affiliation. In equilibrium, the monopoly will locate at $s_M = \varepsilon$,¹¹ which results in low pluralism and high affiliation. And if participation is related more to strictness than affiliation, then the monopoly will have high membership and low participation.

This result matches the predictions of the supply side theory of religion that a monopoly denomination will not demand much from its affiliates (low strictness), and its affiliates will not devote much to the denomination in return [Stark and Finke (2000)]. Such denominations are already secularized in that they do not place demands on members much above

¹¹By locating at $s_M = 0$, individuals are indifferent between non-affiliation and affiliation. So the only time locating at $s_M = 0$ would be a best response is if $F(0) \geq \frac{1}{2}$.

what secular society already demands. Such is the case in some regulated religious markets of Western Europe. To choose one particular example, again consider the Church of Sweden. Ninety-five percent of all Swedes are registered as members, but only two percent attend on any given Sunday [Finke (1997)].

Notice that economic growth does not change the outcome in the monopoly setting. The monopoly will still locate at ε even with first-order or second-order stochastic shifts in $F(s)$ and with changes in A , c , and $\bar{\pi}$. It is possible that if $\bar{\pi}$ increases too much with respect to A and c , then remaining in the market becomes too costly even for the monopoly religion, in which case the equilibrium has no denomination. However, given that monopoly religions are often subsidized, it is likely that c will also remain sufficiently low. Thus, economic growth is not likely to change the outcomes in a regulated religious monopoly. A regulated market will remain secularized as economic growth occurs because of supply side regulations.

Proposition 5: *A regulated monopoly denomination will choose minimum strictness, and economic growth will have no effect the denomination's behavior.*

A regulated duopoly will have a limited degree of denominational competition. The duopoly outcomes fit qualitatively between the open and monopoly markets, i.e., strictnesses and pluralism will be lower than in an open market and higher than in monopoly. The same holds for the effects of economic growth. The effects on pluralism, affiliation, and participation are limited.

These findings support the religious economies claim that “To the degree that a religious economy is unregulated, it will tend to be very pluralistic” [Stark and Finke (2000) p. 198]. In support of this claim, Barro and McCleary’s (2002, 2003a, 2003b) recent cross-country regressions find that countries with religious regulations exhibit less religious vitality.¹² Religious economies proponents have long referred to thriving religious organizations in the United States as the best example of the impact of open religious markets [Warner (1993)]. While some relate American religiosity to cultural backwardness, a lack of sophistication,

¹²Although they also find that countries with state religions exhibit higher vitality, likely due to religious subsidies.

too little influence by intellectuals, and other factors [Stark (1999)], my model presents a different picture. Instead of “American exceptionalism” on the demand side, it is an open market environment on the supply side that explains American religious pluralism.

Observers have also noted that American clergy are very responsive to their congregations, and even act to maintain or increase their memberships [Stark and Finke (2000)]. Since my model predicts that pluralism is increasing in A , it could be argued that deregulation of a religious economy acts to increase pluralism through two mechanisms. There is a direct effect of a decreased cost of entry, but there may also be an indirect effect through a changing in denominational preferences. In an open and competitive religious market, only those clergy that are responsive to their members’ needs (i.e., have higher A) will succeed and, therefore, survive. Thus, reducing regulations can also lead to denominational leaderships that care more about meeting the religious needs of their memberships, which in turn increases religious pluralism as denominations compete for members.¹³

6 Conclusion

I present a model of religious competition that accounts for both the demand and supply sides of the religious market. The effects of economic growth on religious participation and pluralism in an open religious market are ambiguous *a priori*. Economic growth can increase the opportunity costs of religious demand and supply, thereby working towards religion’s demise. However, there are countervailing factors. Economic growth can lead to increased inequality and improved technology of religious production, both of which increase the range of observed religious behavior. Thus, competitive forces in an open religious market can lead denominations to adapt to changing demand and supply conditions, thereby keeping religion alive despite forces leading to secularization. In a regulated market, however, the effects

¹³Such analysis helps explain religious revival in post-communist eastern Europe. Communist ruling parties attempted to regulate or eliminate all religious practices and institutions. Official anti-religious sentiment vanished with the fall of communism, and as predicted by the model, many of the former communist countries then experienced an increase in religious vitality. However, not all countries experienced this upsurge, e.g., see Froese and Pfaff (2001) for an examination of the East German and Polish exceptions. The future of religion in eastern Europe is not clear, however, since more established religions are attempting to reassert monopoly or privileged status [Stark and Finke (2000)].

of economic growth are minimal since secularization occurs as a result of the regulations. A monopoly competes only with the individuals' non-affiliation option, and this does not change as economic growth occurs.

My results also provide a theoretical framework to interpret existing empirical work and guide future empirical work. In cross-country panel regressions, Barro and McCleary (2002, 2003a, 2003b) find that there is no relationship between income and religiosity (i.e., church attendance, belief in heaven, etc.) when controlling for education, urbanization, and life expectancy. The lack of a clear correlation is likely due to the presence of counteracting factors also associated with rising income levels, some of which act to increase religiosity while others act to decrease religiosity. The model suggests that a negative relationship will be found once other supply and demand factors were controlled for. Future empirical work should use the Barro-McCleary framework to explore other connections between economic development and answer questions such as the following. Do changes in religious technology also change as income levels increase? Is the negative impact of rising income levels on religiosity diminishing? Does pluralism (which Barro and McCleary find has a positive impact on religiosity) increase as growth increases thereby countering the secularization trend?

Indeed, there are additional issues related to the impact of growth on religion not considered in my model or existing empirical work that should be taken into account in future research. Consider Iannoccone's (1990) notion of "religious capital"—the idea that past consumption within one denomination or religious tradition increases the value of present consumption of that denomination. If years of state religion in Europe have tied individuals' religious capital to the dominant church, then even with recent deregulation we may not observe religious revival because the capital is tied too strongly to the dominant church. Thus, we may observe continued secularization in countries that recently opened their religious markets but were regulated in the past. This will apply more so to western Europe than eastern Europe since communist rulers in eastern Europe restricted all denominations thereby reducing religious capital for all denominations. This, in turn, helps explain the religious revival in Eastern Europe after the fall of communism and the lack of revival in

Western Europe where religious capital is still tied to the dominant churches. Moreover, not properly controlling for centuries of past regulations in Barro-McCleary style regressions may lead to estimates that underestimate the overall impact of state regulations on religiosity over the long run as economic growth occurs.

A similar concern arises with the related notion of “spiritual capital.” Whereas religious capital resides in the individual, spiritual capital operates at a societal level. Specifically, spiritual capital is that subset of social capital—interpersonal networks that sustain norms of trust and reciprocity—generated by religious organizations which acts to increase the secular returns to religious participation [Smidt (2003)]. As evidence of such secular returns, Glaeser and Sacerdote (2002) find that education in the United States is positively associated with church attendance but negatively associated with religious beliefs (one interpretation is that an increase in education decreases a person’s belief in heaven or hell, while simultaneously increasing the returns to religious participation by increasing the returns to social connections). If spiritual capital develops coincidentally with economic growth in a thriving religious market but does not develop in countries with regulated, stagnant religious markets, then, again, regressions that do not control for past regulations may lead to estimates that underestimate the role of regulations.

A number of theoretical extensions can be made to the model. Incorporating the religious and spiritual capital ideas would require a repeated game setup. Denominations would then not serve non-intersecting market niches as they do in my model since individuals may find it costly to switch affiliations [Montgomery (1996)]. Another variation involves more richer representations of denomination preferences. Barros and Garoupa (2002) assume that the denomination acts to maximize the welfare of its members. In their formulation, the value of a denomination’s public (club) good is independent of the demands placed by the denomination on its members, yet this assumption counters existing thought on how denominations provide religious benefits [Iannaccone (1992)]. Modeling different denomination preferences has the potential to yield new insights into religious competition. Finally, the model could formally account for the quality of the religious good. Religious producers adapt to changing religious demand by offering innovative religious services, and formally accounting for

different types of innovation may help us understand how the nature of religious services change over time.

While each of these variations may yield added insights into our understanding of how economic growth affects religion, none of them should alter the fundamental conclusions of this paper. Religion is thriving in many parts of the world, and competitive forces are likely to keep religion alive for now—at least in open religious markets.

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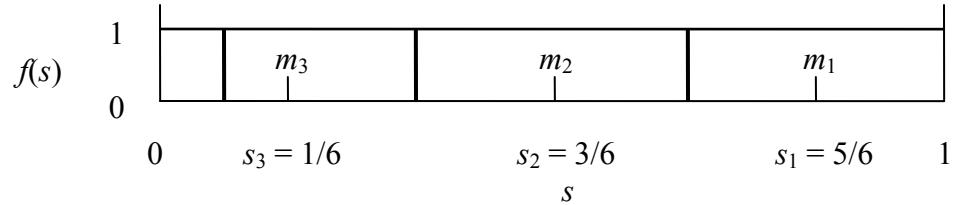
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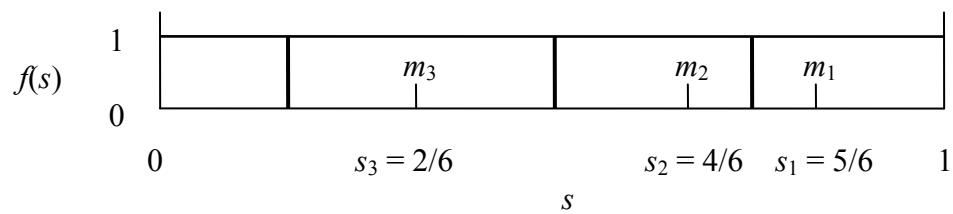
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Figure 1: Some Religious Market Equilibria

(a) An equilibrium with $D^* = 3$



(b) A second equilibrium with $D^* = 3$



(c) An equilibrium with $D^* = 4$

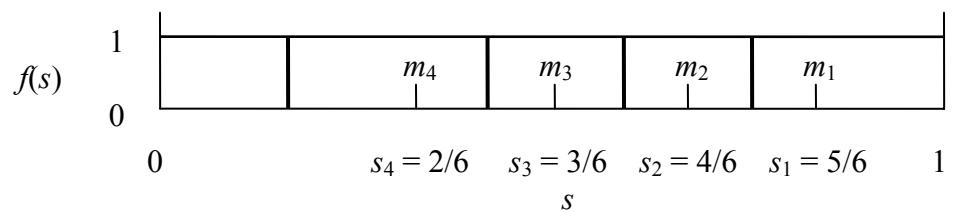


Figure 2: Bell-shaped Distributions

